



# MSN 1823 (M) Edition 2

## Amendment 1

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### THE INLAND WATERS PASSENGER SHIP CODE

**(Safety Code for Passenger Ships Operating Solely in UK Categorised Waters, Edition 2, Amendment 1)**

**Notice to all Owners & Operators of Passenger Ships operating solely in UK Categorised Waters; Ship Builders, Designers and Surveyors.**

*This notice should be read with The Merchant Shipping (Passenger Ships) (Safety Code for UK Categorised Waters) Regulations 2010.*

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#### Summary

Some years ago, the Maritime and Coastguard Agency undertook a review of the regulations for passenger ships operating solely within UK categorised waters. The original edition of this safety Code was then developed to provide the principal technical requirements for such ships in a single comprehensive document; MSN 1823, introduced in 2010.

Those requirements have since been further reviewed and revised in consultation with the UK domestic passenger ship industry and marine surveyors. The result is MSN 1823 Edition 2: The Safety Code for Passenger Ships Operating Solely in UK Categorised Waters.

This revised Code contains safety standards that aim to meet the expected normal levels of risk in ships' operating environments, and includes simplified requirements where appropriate.

The requirements in MSN 1823 Edition 2 apply to ships constructed, or which have been converted to passenger ships, on or after **1 January 2018**.



## Introduction

This Code applies to all new passenger ships operating solely in UK categorised waters, except those ships to which the Merchant Shipping (High Speed Craft) Regulations 2004, as amended, apply.

### Please Note

Text in regular font comprises information on requirements made mandatory by The Merchant Shipping (Passenger Ships) (Safety Code for UK Categorised Waters) Regulations 2010 – SI 2010/680.

*Text in italics comprises information on requirements that are made mandatory by other legislation. See paragraph 3.1.8.*

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## **1 Foreword**

- 1.1 This Code has been developed for application to new passenger ships operating solely in UK categorised waters.
- 1.2 Ships which also operate to sea must have appropriate certification for seagoing operations which in many cases may also be valid for operation in UK categorised waters.
- 1.3 This code may also be applied to UK flagged ships operating on the inland waters of foreign countries, as an alternative to the statutory requirement (Class II(A)), subject to the agreement of the MCA. National and local regulations of the host state will also need to be complied with.
- 1.4 The standards in this Code have been developed by the Maritime and Coastguard Agency (MCA) in consultation with its surveyors and the domestic passenger ship industry.
- 1.5 This Code provides the principal requirements in a consolidated document. Where this Code does not provide specific requirements for a particular topic, it highlights where such requirements may be found.
- 1.6 The primary aim of the Code is to set standards of safety and protection for all persons onboard and to minimise the potential risk to third parties.
- 1.7 The builder, owner/operator and master of the ship, as appropriate, shall take all reasonable measures to ensure that the ship is constructed, maintained and operated in accordance with the requirements of this Code, and also that it is suitable for the purpose intended, having regard to the area the ship will be operating in.
- 1.8 With reference to section 4.8, it is most important that the builder and owner/operator of the ship have full plan approval for the proposed build from the certifying authority(s), prior to the commencement of the build. This will minimise the risk of non-compliances with the Code occurring during the build, which may be costly to rectify for the builder or owner/operator. A list of required approvals is provided in Annex 10.
- 1.9 Further to 1.6 above, and with reference to section 4, it is also important to emphasise in the strongest possible way that all ships must fully comply



with the relevant hull construction and watertight integrity, machinery, control systems, electrical systems and bilge pumping arrangement standards of a recognised Classification Society, or the Sea Fish Industry Authority (Seafish), as appropriate. This Code provides minimum requirements that Classification Society or Seafish standards must satisfy for the machinery, control systems, electrical systems and bilge pumping arrangements. They are not an alternative to full compliance with Classification Society or Seafish requirements.

- 1.10 It is important to stress that, whilst all reasonable measures may have been taken to ensure a safe ship, total safety can never be guaranteed. As a consequence, it is strongly recommended that the owner/operator of a ship shall take out a policy of insurance for all persons onboard. It is recommended that a copy of the certificate of insurance shall be kept on-board the ship.
- 1.11 Compliance with the Code in no way obviates the need for ships and Masters to comply with competent harbour authority rules, regulations and Byelaws. For instance the above authorities may require that insurance cover, including passenger liability is carried.

## 2 Definitions

In this Code:-

"A' Class Division" has the same meaning as provided in the (FTP Code) and means a bulkhead or part of a deck which is -

- (a) constructed of steel or other equivalent material;
- (b) suitably stiffened;
- (c) so constructed as to be capable of preventing the passage of smoke and flame to the end of the 60 minute standard fire test; and
- (d) so insulated where necessary with suitable non-combustible materials that if the division is exposed to a standard fire test the average temperature on the unexposed side of the division shall not increase more than 140°C above the initial temperature nor shall the temperature at any one point, including any joint, rise more than 180°C above the initial temperature within the time listed below –

"A-60" standard 60 minutes;

"A-30" standard 30 minutes;

"A-15" standard 15 minutes;

"A-0" standard 0 minutes.

And in the case of a non-steel or equivalent ship, "A' class division" means:-

- (a) an equivalent level of fire resistance to 'A-60' or 'A-30' as defined for steel is achieved by applying fire protection media to the construction material;
- (b) the fire protection media utilised have been subject to the procedure for testing and approval of fire protection media for use with composite and wooden materials. Reference to further information is detailed in Annex 6;
- (c) the fire protection media have been fitted in accordance with procedures applied in the fire testing and have received MCA

approval;

“Accident” has the same meaning as in the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 which is:

(a) a marine casualty, which is an event or sequence of events that has resulted in any of the following and has occurred directly by or in connection with the operation of a ship involving—

- (i) the death of, or serious injury to, a person;
- (ii) the loss of a person from a ship;
- (iii) the loss, presumed loss or abandonment of a ship;
- (iv) material damage to a ship;
- (v) the stranding or disabling of a ship, or the involvement of a ship in a collision;
- (vi) material damage to marine infrastructure external of a ship, that could seriously endanger the safety of the ship, another ship or any individual;
- (vii) pollution, or the potential for such pollution to the environment caused by damage to a ship or ships, or

(b) a very serious marine casualty, which is an event or sequence of events that has resulted in any of the following and has occurred directly by or in connection with the operation of a ship involving—

- (i) the total loss of a ship;
- (ii) loss of life;
- (iii) severe pollution, or

(c) a serious marine casualty, which is an event or sequence of events that has occurred directly by or in connection with the operation of a ship but which does not qualify as a very serious marine casualty, that involves—

- (i) fire;
- (ii) explosion;
- (iii) collision;
- (iv) grounding;
- (v) contact;
- (vi) heavy weather damage;
- (vii) ice damage, or a suspected hull defect;

resulting in any of the following—

- (aa) the immobilization of the main engines;
- (bb) extensive accommodation damage;

(cc) severe structural damage including penetration of the hull under water rendering the ship unfit to proceed;

(dd) pollution;

(ee) a breakdown that necessitates towage or shore assistance, or

(d) a marine incident, which is an event or sequences of events other than those listed in sub-paragraphs (a) to (c) which has occurred directly in connection with the operation of a ship that endangered, or if not corrected would endanger the safety of a ship, its occupants or any other person or the environment.

“Accommodation space” means any internal space provided for the use of persons onboard;

“Amphibious Vessel” (AV); means a self-propelled vessel capable of being used on land as well as on water;

“Amphibious Passenger Vessel” (APV); means an amphibious vessel capable of carrying more than 12 passengers;

For the purposes of these definitions “amphibious vessel” does not include hovercraft.

Use on water includes any fluid, swamp or marsh which is capable of supporting the vessel in displacement or non-displacement mode.

“Annual survey” means the survey undertaken on an annual basis to verify compliance with this Code to enable the Passenger Ship Safety Certificate to be endorsed;

“Approved” means approved by, or on behalf of, or otherwise acceptable to the MCA under Merchant Shipping legislation, unless otherwise specified in this Code;

“Auxiliary machinery space” means any space containing refrigerating, stabilising, ventilation, air conditioning machinery or similar;

“Breadth of the ship” means the greatest moulded breadth at or below the ship’s deepest subdivision load waterline for subdivided ships, and at the gunwale for other ships;

“Bulkhead deck” means the uppermost deck up to which watertight

bulkheads, as required by this Code, are carried;

“Categorisation of waters” means the categories of waters as detailed in MSN 1837 (M), where Category A is the least onerous and Category D is the most onerous of the water categories. The description relating to each category is given below:

“Category A” means narrow rivers and canals where the depth of water is generally less than 1.5 metres;

“Category B” means wider rivers and canals where the depth of water is generally 1.5 metres or more and where the significant wave height could not be expected to exceed 0.6 metres at any time;

“Category C” means tidal rivers and estuaries and large, deep lakes and lochs where the significant wave height could not be expected to exceed 1.2 metres at any time;

“Category D” means tidal rivers and estuaries where the significant wave height could not be expected to exceed 2.0 metres at any time;

“Certifying Authority” means either the Secretary of State or one of the organisations authorised by the Secretary of State to:

- a) appoint persons for the purpose of examining vessels and issuing and signing Declarations of Survey; and
- b) issue Passenger Certificates.

At the date of issue of this Code the MCA is the only Certifying Authority authorised for the purposes of this Code.

“Code” means this Code unless another Code is specified;

“Control position” means a position which is continuously manned whilst the ship is under way;

“Crew” means a person employed or engaged in any capacity onboard a ship in the business of the ship;

“Daylight hours” means between one hour before sunrise and one hour after sunset (for ships operating in the UK) in the case of ships fitted with navigation lights conforming to regulations for the prevention of collisions at sea made under section 85 of the Merchant Shipping Act 1995, and between sunrise and sunset in the case of any other ship.

“Decked ship” means a ship with a continuous watertight weather deck which extends from stem to stern and has positive freeboard throughout, in any condition of loading of the ship;

“Disabled person” or “person with reduced mobility” means any person whose mobility when using transport is reduced as a result of any physical disability (sensory or locomotive, permanent or temporary), intellectual disability or impairment, or any other cause of disability, or as a result of age, and whose situation needs appropriate attention and adaption to their particular needs of the service made available to all passengers;

“Draught” unless stated otherwise, means the vertical distance from the underside of keel amidships to the deepest subdivision load waterline or freeboard mark, as appropriate;

“Existing ship” means a ship which is not a new ship;

“Freeboard” means the distance measured vertically downwards from the lowest point of the upper edge of the weather deck to the waterline in still water or, for an open ship, the distance measured vertically downwards from the lowest point of the gunwale to the waterline;

“FTP Code” means the International Code for Application of Fire Test Procedures, 2010, published by the International Maritime Organization.

“Galley” means a space containing electrical cooking equipment or similar food heating appliances where the maximum power of any single appliance exceeds 5 kilowatts, or a space containing a deep-fat cooking facility or liquefied petroleum gas (LPG) installation for use with cooking equipment;

“High speed craft” (HSC) is a craft capable of maximum speed in metres per second (m/s), equal to or exceeding

$$3.7 \nabla^{0.1667}$$

Where:  $\nabla$  = volume of displacement corresponding to the design waterline (m<sup>3</sup>)

“Length” means the length of ship measured between perpendiculars taken at extremities of the deepest subdivision load waterline or freeboard mark, as appropriate.

“LOA” means the distance between the foreside of the stem and the aft side of the stern.

“Master” includes every person (except a pilot) having command or charge of a ship.

“Machinery space” means any space which contains propelling machinery, boilers, oil fuel units, steam, internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

“Machinery space ( $\geq 375$  kW)” means a machinery space which contains either: –

(a) internal combustion type machinery, where such machinery has in the aggregate a total power output of not less than 375 kilowatts;

or

(b) any oil fired boiler or oil fuel unit;

“major modification” means a modification that substantially alters the passenger carrying capacity of that ship or substantially increases the expected life of that ship.

“Margin line” means a line drawn at least 76 mm below the upper surface of the bulkhead deck at side.

“Marine Guidance Note” (MGN) means a Notice described as such and issued by the MCA;

“MCA” means the Maritime and Coastguard Agency, an executive agency of the UK Department for Transport.

“MED” means the EU Marine Equipment Directive 2014/90/EC and “MED approved” means approved in accordance with the requirements of that Directive;

“Merchant Shipping Notice” (MSN) means a Notice described as such and issued by the MCA;

“Mobile phone” means a portable telephone which must be maintained charged and operational, including within range of signal coverage;

“NMOC” means National Maritime Operations Centre;

“New ship” for the purpose of this Code means a ship in respect of which there did not exist, on 6 April 2010, the date that this Code came into force, a valid passenger ship certificate;

“Open ship” for the purpose of this Code means a ship which, within its length, is:-

- (a) not fitted with a watertight deck; or
- (b) is fitted with a watertight deck over part of its length; or
- (c) is fitted with a watertight deck over the whole of its length but the freeboard to the deck does not meet the minimum requirement for freeboard;

"Passenger" means any person carried on a ship except:

- (a) a member of the ship's crew,
- (b) a person on board the ship either in pursuance of the obligation laid upon the master to carry shipwrecked, distressed or other persons, or by reason of any circumstance that neither the master nor the owner nor the charterer (if any) could have prevented or forestalled,
- (c) a child of under one year of age;

“Passenger ship” means a ship carrying more than 12 passengers;

"Passenger deck" means any deck space to which passengers have access;



“Person with reduced mobility” – see “Disabled person”;

“Ro-ro passenger ship” means a passenger ship with ro-ro spaces or special category spaces;

“Ro-ro spaces” are spaces not normally subdivided in any way and normally extending to either a substantial length or the entire length of the ship in which motor vehicles with fuel in their tanks for their own propulsion and/or goods (packaged or in bulk, in or on rail or road cars, vehicles (including road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction;

“Ship” includes every description of vessel used in navigation;

“Ships constructed” means ships, the keels of which were laid, or which were at a similar stage of construction on or after 1 January 2018, except in the case of a ship the keel of which was laid or which was at a similar state of construction before that date, but which was not a passenger ship, which is converted to a passenger ship after that date. Such a ship is to be treated as constructed on the date of which such conversion commences.

“Similar stage of construction” means the stage at which –

- (a) construction identifiable with a specific ship begins; and
- (b) assembly of that ship has commenced comprising at least 50 tonnes or one percent of the estimated mass of all structural material, whichever is less;

“Special category spaces” are those enclosed vehicle spaces above and below the bulkhead deck, into and from which vehicles can be driven and to which passengers have access. Special category spaces may be accommodated on more than one deck provided that the total overall clear height for vehicles does not exceed 10m;

“Steel or other equivalent material” – in the context of ‘steel or other equivalent material’, ‘equivalent material’ means any non-combustible material which, by itself, or due to insulation provided, has structural integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation);

"Summer" in UK waters means from the 1st April to 31st October, both dates inclusive. The 1st April date shall be substituted by the date 14 days before Good Friday in any year in which this is earlier, but no earlier than the 17th March.

"Surveyor" means an exclusive surveyor of the MCA, or a surveyor from a UK authorised Classification Society, or the Sea Fish Industry Authority (Seafish) when they are surveying the ship in order to issue a Partial Declaration of Survey of a Passenger Ship.

"Watertight" in relation to structure means capable of preventing the passage of water in either direction under the head of water likely to occur in the intact or damaged condition;

"Weather deck" means the main deck which is exposed to the elements;

"Weathertight" means capable of preventing the admission of a significant quantity of water into the ship when subjected to a hose test;

"Workers" include every person employed or engaged in any capacity onboard any ship;

**Please Note: In the definitions given above, a reference to any document includes any subsequent amendments to that document.**

### 3 Application and Interpretation

#### 3.1 Application

- 3.1.1 This Code applies to new passenger ships which operate within UK categorised waters A, B, C or D, irrespective of construction material. Non-UK ships may comply with this Code, or alternatively with the EU Technical Requirements for Inland Waterway Vessels, Directive (EU) 2016/1629 (as amended), together with the additional UK national requirements laid down in MSN 1824. UK ships operating on foreign inland waterways are required to comply with UK Class II(A) regulations, or this Code as an equivalent standard, and the national and/or local requirements of the host state.
- 3.1.2 Ships which satisfy the High Speed Craft (HSC) definition provided in Section 2, but are not capable of operating at speeds of 20 knots or more, are exempted from the provisions of the HSC Regulations (SI 2004 number 0302) by way of a general exemption (under regulation 4 of the Regulations) and must comply with the provisions of this Code. Ships which satisfy the formula, and are capable of operating at speeds of 20 knots or above, must comply with the HSC Regulations.
- 3.1.3 The requirements in this Code (MSN 1823 Edition 2) apply fully to ships constructed on or after **1 January 2018**, or which have been converted to a passenger ship on or after that date. Ships holding valid certification issued before that date, under the previous version of the Code (the original MSN 1823):-
- Remain subject to, and must continue to meet, the original requirements in full; but,
  - May fully phase into Edition 2 compliance;
    - On phasing in, such a ship must fully satisfy all relevant requirements of Edition 2;
  - It shall be clearly recorded on the Passenger Ship Safety Certificate, and the official file, to which version of the Code the ship is currently surveyed and certificated against;
  - The format of the original certificate has been slightly revised. Annexes 8 and 9 of MSN 1823 Edition 2 include this revised format for the certificates.

- 3.1.4 Ships certificated to those standards that were in place prior to April 2010 may phase into this Code (Edition 2) at the discretion of the owner/operator, subject to survey and full compliance with relevant requirements.
- 3.1.5 Where exceptionally, the standards referred to in this Code overlap with other standards that are external to it, then the more onerous standard/s should be used.
- 3.1.6 The provisions of paragraphs 3.1.2 and 3.1.3 above do not affect the overarching application conditions set out in The Merchant Shipping (Passenger Ships) (Safety Code for UK Categorised Waters) Regulations 2010, which underpin both editions of this Code. Thus, an existing ship (whether constructed before or after April 2010) that had not maintained passenger ship certification would need to meet in full the relevant requirements of this Code before it could be surveyed and certificated for further operation.
- 3.1.7 The Code consolidates the principal, applicable construction, equipment and operational requirements into a single document. Most of these requirements are made mandatory by the Merchant Shipping (Passenger Ships) (Safety Code for UK Categorised Waters) Regulations 2010 (SI 2010/680), whereas certain other requirements are given legal effect by other legislation. The safety requirements which are made mandatory by SI 2010/680 are those contained in the following sections:

4B. Requirement for a Partial Declaration of Survey

6. Watertight Integrity

7. Machinery

8. Electrical Arrangement

9. Bilge Pumping

10. Intact and Damage Stability Criteria

11. Freeboard and Freeboard Marking

12. Life-Saving Appliances

13. Emergency Information for Passengers and Escapes

14. Search and Rescue (SAR) Requirements

15. Fire Safety

16. Safety Management System

17.2 Guardrails and stanchions

17.3 Anchor handling arrangements

- 17.4 Mooring lines, Bollards/cleats and Mooring Equipment
- 19. Navigation
- 20.2 First Aid Kits
- 20.3 Code of Safe Working Practice
- 21.1 Minimum Manning Levels
- 21.3 Training
- 22. Passenger Counting and Registration
- 23. Passenger and Crew Accommodation
- 24. Survey and Certification Requirements
- 25. Additional Requirements for Ro-Ro Passenger Ships.
- 26. Additional requirements for planing and semi-displacement passenger ships which are not High Speed Craft

- 3.1.8 The following sections of this Code are made mandatory by other legislation. This Code does not amend the detail of that legislation, but the requirements are included within the Code for convenience and ease of reference. Each requirement can be found in more detail in the individual SIs and related guidance as detailed in Annex 6 if required. These requirements are subject to revision, so those using this Code should ensure that they are using the latest version/s of these regulations and guidance documents. These sections are written in *italics* throughout the Code to assist in identifying them:

- 17.1 – Means of Access*
- 18 – Pollution Prevention (including carriage of Dangerous Goods and Marine Pollutants in Packaged Form)*
- 20.1 – Safe Movement of Passengers and Crew*
- 20.4 – Alcohol Licensing*
- 20.5 – Health and Safety*
- 20.5.3 – Noise*
- 20.5.4 – Vibration*
- 20.6 - Smoking*
- 21.2 – Minimum Qualifications*
- 21.3 - Training*
- 21.4 – Hours of Work Provisions*
- 21.5 – Alcohol and Drugs*
- 21.6 – Medical Fitness*
- 23.8 – Crew Accommodation*

- 3.1.9 The Code also includes items of best practice guidance which should be

observed where practicable, but which is not a mandatory requirement.

- 3.1.10 The non-mandatory guidance contained in the Code is section 5 – Access for Persons with Reduced Mobility. This section is also written in *italics* to easily identify that it is not made mandatory by this Code.
- 3.1.11 Planing and semi-displacement passenger ships, which are not high speed craft in accordance with section 3.1.3 must additionally comply with the requirements of Part C of this Code - Additional requirements for planing and semi-displacement passenger ships.
- 3.1.12 For the purpose of this Code a new passenger ship is any ship that did not hold a valid passenger ship certificate issued under regulation 11 of The Merchant Shipping (Survey and Certification) Regulations 1995 (SI 1995/1210) on 6 April 2010, the date this Code entered into force. Transitional arrangements were permitted in some circumstances as outlined in SI 2010/680.
- 3.1.13 Ro-ro ships shall comply with the additional requirements given in Part B of this Code.
- 3.1.14 Ships must be compliant with the requirements of this Code that pertain to the most onerous operations it is expected to undertake. Designers and builders may wish to take account of the requirements for operations in other categories of water to maximise flexibility of use of the ship in the future. Owners and designers should be aware that by only considering its use in a lower category of water it may not be feasible to modify the ship to allow it to be used in a higher category of water in the future. A ship that changes to operate in a more onerous mode or category of water shall comply with the applicable section/s of this Code, and be re-surveyed and certificated accordingly.

#### UK Ships

- 3.1.15 An existing UK ship only becomes, and is treated as, a "new" ship under the following circumstances:-
- as described in paragraph 3.1.10;
  - when a non-passenger ship is converted to a passenger ship.

## Non-UK Ships

- 3.1.16 Non-UK inland waterways passenger ships with either Rhine or Union Inland Navigation Certificates under Directive (EU) 2016/1629 (as amended), on Technical Requirements for Inland Waterway Vessels (TRI WV). Such foreign vessels must comply fully with the standards of the TRI WV Directive without recourse to the transitional provisions it permits for existing vessels. In addition, they must comply with UK requirements for LSA, bridge visibility, passenger counting, DSM and other operational requirements. If they meet these requirements they may be treated as "existing" UK ships.

### **3.2 Areas of Operation**

- 3.2.1 The areas of operation are:-

- Category A only; or
- Categories A and B only; or
- Categories A, B, and C only; or
- Categories A, B, C and D

- 3.2.2 Where it is considered that a ship is operating in category C waters that are large deep lakes or lochs, the status of these waters should be confirmed with the surveyor at early stage in the design process to ensure that the ship design considers this, particularly in relation to the requirements for the carriage of navigation and safety equipment.

### **3.3 Interpretation**

- 3.3.1 Any clarification or interpretation of this Code should be sought through the local Marine Office of the MCA.

### **3.4 Updating of this Code**

- 3.4.1 This Code may be subject to review.
- 3.4.2 The Merchant Shipping (Passenger Ships) (Safety Code for UK Categorised Waters) Regulations 2010 provide for, from time to time, any document amending or replacing this Code which is considered relevant to be specified by the Secretary of State in a Merchant Shipping Notice.

### **3.5 Equipment Standards and Guidance**

- 3.5.1 When this Code requires that a particular piece of equipment or machinery shall be provided or carried onboard, or that any particular provision shall be made, the required standard is detailed in Annex 5 of this Code.
- 3.5.2 Further guidance related to the requirements of this Code is referenced in Annex 6.
- 3.5.3 Equipment on board which is expected to be relied on in situations affecting safety or pollution prevention must be in operating condition. If such equipment is inoperative and is in excess of the equipment required by this code it shall either be repaired, removed or if removal is not practicable, clearly marked as inoperative and secured. Further guidance can be found in MGN 79 (M+F) "Safety Equipment and Pollution Prevention Equipment Carried in Excess of Statutory Requirements".

### **3.6 Risk Assessment of Operations**

- 3.6.1 While every effort has been made to ensure this Code is suitable for a generic passenger ship operating on categorised waters, there may be local conditions or circumstances which require additional measures to be put in place to mitigate known risks. Prior to plan approval taking place, a risk assessment shall be carried out by the owner/operator to ensure that any local conditions or circumstances are adequately considered and all known risks are mitigated. This should be presented to the Certifying Authority(s) conducting the surveys prior to plan approval so that they too may take account of the risks identified.
- 3.6.2 If a ship is moved from one area of operation to another area of operation, a new risk assessment required by 3.6.1 should be conducted. Such a risk assessment should include the assessment of any previously accepted equivalent arrangements to ensure that they will continue to provide an equivalent level of safety in the new area of operation.

### **3.7 Equivalence**

- 3.7.1 The MCA may permit any other piece of equipment or machinery to be provided or carried, or any other provision to be made other than those



required in Annexes 5 and 6, provided that the MCA is satisfied by trials, or otherwise, that the alternative is at least as effective as that required by this Code and any such equivalence is documented and agreed using the MCA's Assessment of Equivalence to Statutory Requirements Form.

### **3.8 Technical Standards**

#### **3.8.1 Any reference in these Regulations to -**

- (a) a British Standard;
  - (b) a Merchant Shipping Notice; or
  - (c) any other specified code or guidelines;
- shall include -

- (i) a reference to any document amending that publication which is considered by the Secretary of State to be relevant from time to time and is specified in a Merchant Shipping Notice, Marine Guidance Note or Marine Information Note; and,
- (ii) with respect to a British Standard, a reference to a relevant standard of an EEA State other than the United Kingdom.

## **PART A – General Requirements**

### **4A Approvals and Assessments**

#### **4A.1 Pre – construction approvals**

The following approvals should to be in place prior to the commencement of the construction of the ship to minimise the risk of non-compliance with the regulations.

4A.1 1 Relevant Classification Society, Sea Fish Industry Authority (Seafish), or MCA approval using LR SCC Rules, for hull construction and watertight integrity, machinery, control systems, electrical systems and bilge pumping arrangement standards. (see 4.4 - 4.10). MGN 322, Annex 3 provides a list of the plans that are required to demonstrate compliance.

4A.1.2 It is also most strongly recommended that consideration is given to and where possible approval is sought for the following items prior to the commencement of construction as they may impact on the final design:-

- the life-saving appliances to be provided, including their stowage and deployment arrangements (see section 12);
- the fire protection arrangements (see section 15);
- Fire fighting equipment (see section 15);
- Navigation equipment (see section 19);
- Bridge visibility assessment (see section 19);
- Anchor and anchor handling arrangements (see section 17);
- Crew and passenger accommodation, and means of escape (see sections 13 and 23);
- Any equivalent arrangements are formally approved (see section 3);
- Safe manning taking into account the above considerations.

#### **4A.2 Pre – construction appraisals**

4A.2.1 Review and appraisal of the risk assessment for the intended area of operation of the ship, including, as applicable, any proposal for the use of low flash point fuels. (see 3.6 and 7.5.2)

4A.2.2 Assessment of the stability and freeboard. (see sections 10 and 11)

4A.2.3 Life-saving Appliances. Appraisal of the risk assessment required by 12.6.1, if applicable to the intended operation of the ship, to determine the LSA provision. (see section 12)

4A.2.4 Assessment of the required bollards and cleats and other mooring equipment having regard to the size and intended service of the ship (see 17.4).

#### **4A.3 Approvals required prior to commencement of operations**

4A.3.1 Partial Declaration for hull and watertight integrity, machinery, electrical systems, bilge systems and control systems (see 4B.1).

4A.3.2 Stability following a stability test (see 10.3)

4A.3.3 Freeboard assignment (see section 11)

4A.3.4 Passenger Counting and Registration (see section 22)

4A.3.5 SAR Plan (see section 14)

4A.3.6 Minimum manning (see 21.1)

4A.3.7 GAS SAFE (see Annex 1, 2.1)

4A.3.8 EIAPP and Technical File (see 18.4.2)

4A.3.9 Ships of 400GT and over operating in category C or D waters require a UKOPP and UKAPP Certificate, and an International Anti-Fouling System Certificate (see 18.4.1, 18.5.2 and 18.6.2) Ships over 24 metres but less than 400GT require a self declaration of compliance that they meet EU Regulation 782/2003 on the prohibition of organotin compounds on ships ( Anti-Fouling Systems) (See 18.6.2).

4A.3.10 Ships carrying packaged dangerous goods require a Document of Compliance for the Carriage of Dangerous Goods (see 18.7).

4A.3.11 Passenger Ship Safety Certificate

4A.3.12 Safety Management System (see section 16)

#### 4A3.13 Garbage Management Plan (see 18.2.3)

### **4B Requirement for a Partial Declaration of Survey**

Rationale: MCA do not produce technical standards for hulls and watertight integrity, machinery, control systems, electrical systems or bilge pumping arrangements. Therefore hull, machinery, control systems, electrical systems and bilge pumping arrangements shall be in accordance with recognised standards, as outlined below.

- 4B.1** The recognised standards are the appropriate Passenger Ship Rules and Regulations of any of the UK authorised Classification Societies listed in 4B.2.
- 4B.2** UK authorised Classification Societies are:
- American Bureau of Shipping;
  - Bureau Veritas;
  - DNV GL;
  - Lloyd's Register;
  - Nippon Kaiji Kyokai; and
  - Registro Italiano Navale.
- 4B.3** The plan approval and survey work during design and build shall be undertaken by the Classification Society that the ship owner has chosen to engage. The Classification Society representative will issue a Partial Declaration of Survey of a Passenger Ship.
- 4B.4** In the case of ships of less than 24 metres in length operating in Category C and D waters or ships of any length operating in Category A or B waters, the plan approval and survey may be undertaken by the MCA, subject to prior agreement by the MCA.
- 4B.5** Where ships are constructed under survey solely by the MCA, they shall be assessed against Lloyd's Register Rules for Special Service Craft with MCA plan approval and survey. A Partial Declaration for such ships will be issued by the Secretary of State.
- 4B.6** Construction plans and relevant calculations for new ships shall be produced in accordance with the requirements specified by the Classification Society's rules, Seafish rules, or Lloyd's Register Rules for Special Service Craft when under survey by MCA, as appropriate. Plans

shall be submitted allowing adequate time for plan appraisal to be completed before construction begins. It is essential that the surveyor appointed by the Classification Society to validate the standard of construction is involved at the outset of the new build project.

**4B.7** Ships of under 24 metres in length, with a single passenger accommodation deck and carrying not more than 70 passengers may be constructed in accordance with the SFIA standards, as an alternative to the provisions of 4B.2. Ships constructed in accordance with SFIA standards must have plan approval, be surveyed during the build and be issued a Partial Declaration of Survey of a Passenger Ship, by a SFIA approved representative. Depending upon the length of the passenger ship, the SFIA standards applicable in this case are: Construction Standards for New Fishing Vessels less than 15 metres Length Overall or Construction Standards for Steel Fishing Vessels of 15 to 24 metres Length Overall, as appropriate to the ship's length.

**4B.8** Where a Classification Society or SFIA are engaged to conduct a partial survey of the ship, they shall mutually agree clear lines of survey authority with the MCA to ensure that all requirements of this Code are surveyed.

**4B.9** The Partial Declaration of Survey of a Passenger Ship shall take the format given in Annex 9 of this Code.

**4B.10 Special Considerations**

Additional areas for consideration

4B.10.1 Ships where hull structure in way of the propeller is at particular risk of breach or damage due to foreign object ingress to the propeller shall fit protection in the form of propeller guards or other arrangements. Factors contributing to the level of risk for the structure include lightweight scantlings in the area, limited propeller clearance and high levels of debris in the operating area. In the case that it is not considered practical to fit such protection, the impracticality shall be demonstrated, and suitable alternative provisions for safety made, such as local hull strengthening.

4B.10.2 Where a canopy is provided covering the passenger compartment, the supports shall not impede emergency escape.

4B.10.3 Welding required for either construction or repairs shall only be carried

out by approved welders with qualifications and experience appropriate to the materials on which they are working.

## **5 Access for Persons with Reduced Mobility**

*Rationale: Ships should be designed and operated to accommodate the needs of persons of reduced mobility as far as is practicable. The guidance in this section is not mandatory but should be observed and implemented unless there are specific aspects of the ship which prevent doing so.*

*Persons of reduced mobility (PRMs) could include, and should not be limited to: wheelchair users, the elderly, passengers travelling with young children, passengers with impaired hearing or vision or physical or mental disability.*

### **5.1 General**

- 5.1.1 *Ships should be constructed and equipped in such a way that a person with reduced mobility can embark, disembark and move throughout the ship easily and safely.*
- 5.1.2 *Passenger areas should meet the needs of persons with reduced mobility as far as practicable.*
- 5.1.3 *In order to help set passenger expectations and to reduce boarding problems, operators of Passenger Ships operating on UK categorised waters are strongly recommended to:*
  - .1 *Include limitations, procedures, processes and training requirements within their Domestic Safety Management (DSM) Systems for the assessment, boarding, welfare and safety of Persons of Reduced Mobility (PRM)s travelling on their ships.*
  - .2 *Include limitations and conditions of travel for PRMs in the Company Terms and Conditions of travel and reflect these, with sensitivity, in publicity and marketing material. In particular PRMs should be encouraged to contact operators in the first instance to discuss their requirements to see if they can be practically and safely achieved.*

### **5.2 Ramps**

- 5.2.1 *Ramps should be fitted where door sills are of such a height as to reduce the access capabilities for persons of reduced mobility.*
- 5.2.2 *Where ramps are fitted in order to give access over a door sill then care*

*should be taken not to allow this to become a tripping hazard to other passengers.*

*5.2.3 It is helpful to paint or 'hatch' a ramp in order that it is easily recognizable as a change in floor level height.*

*5.2.4 Longitudinal slopes and ramps should be kept as shallow as possible, and of consistent gradient, with a slope of 1:20 or less. Where this cannot be achieved, the maximum gradient should never exceed 1:12.*

*5.2.5 The ramp surface should be slip resistant (especially when wet).*

*5.2.6 There should be a colour contrast between a landing and a ramp.*

*5.2.7 Staff assistance should also be available, when required.*

### **5.3 Handrails**

*5.3.1 Handrails should continue beyond the end of the ramp slope or end of stairs and should either return to the wall or down to the floor. The change in slope of the handrail and its return into a wall will signal the start or finish of the ramp.*

*5.3.2 Handrails should:*

- be round, with a diameter of 40-45mm and no sharp bends;*
- have a minimum clearance of 60 to 75mm between handrails and any adjacent surface;*
- have an easy to grip non-slip surface, in a colour which provides a clearly visible contrast (in both colour and tone) with the background against which it is seen;*
- return to the wall, floor or post in a smooth curve at the end. The method used should be consistent throughout the ship; and*
- be provided on each side of steps and ramps. A central double handrail is desirable on wide staircases (over 2000mm).*

### **5.4 Doors on ships**

*5.4.1 It should be possible for crew to unlock toilet doors from the outside in the event of an emergency. An alarm should be installed in the toilet facilities for a passenger to alert the crew if they require assistance.*



5.4.2 *Door openings to public spaces should be wide enough for wheelchairs to pass unimpeded with a free opening of at least 800mm.*

5.4.3 *Special consideration should be made to the size and operable force of opening/closing doors, especially for the use of persons with reduced mobility.*

## **5.5 Best practice guidance**

5.5.1 *Marine Guidance Note (MGN) 306, Designing and Operating Smaller Passenger Vessels; Guidance on Meeting the Needs of Persons with Reduced Mobility, provides practical guidance to help ensure that the design and operation of smaller passenger ships meets the needs of people with reduced mobility.*

## **5.6 Recommended Space Allowances**

5.6.1 *The table below outlines the basic minimum requirements against comparable best practice guidance.*

**Table 5.6.1**

	<b>Minimum Legal Requirement</b>	<b>Best Practice Recommendations</b>
<b>Corridor</b>	<i>-The minimum clear width of corridors shall, as a minimum, be 750mm and should be increased by 50mm for every 5 persons where passenger numbers exceed 75.</i>	<i>- Minimum width of 1200mm. - A clear width 1800mm to allow wheelchairs to pass each other. - Minimum clear head room of 1980mm from the deck.</i>
<b>Stairway</b>	<i>-The minimum clear width of stairways should, as a minimum, be 750mm and should be increased by 50mm for every 5 persons where passenger numbers exceed 75.</i>	<i>- Minimum width between handrails should be 1200mm. - Resting areas should be a minimum of 1200mm by 1200mm, although 1800mm by 1800mm is preferred. - Maximum rise of stairway flights be no more than that of height between decks.</i>
<b>Seating</b>	<i>- No specific requirement for seating for persons with</i>	<i>- At least 4% of the seating in each lounge should have a design and an</i>

	<i>reduced mobility, however seating requirements can be found in section 23.</i>	<i>adjacent clear floor space that permit easy transfer of a person to and from a wheelchair. The floor space should be large enough for an Assistance Dog to lie down.</i>
<b>Space for wheelchair</b>	<i>- No minimum requirements</i>	<i>- Any permanent wheelchair spaces should be designed in the ratio of at least one per hundred passengers so that the wheelchair user may travel sitting in the wheelchair together with other passengers.</i> <i>- At least one of these spaces should be provided. It should be possible to place the wheelchair safely in position.</i>
<b>Toilets</b>	<i>- No dimensional requirements.</i>	<i>- Toilet doorways should be a minimum width of 925mm</i> <i>- The toilet should have a floor space that permits manoeuvring of a wheelchair and have a height and location that allows easy transfer for a person in a wheelchair</i>
<b>Doorways</b>	<i>-The minimum clear width of doorways should, as a minimum, be 750mm and should be increased by 50mm for every 5 persons where passenger numbers exceed 75.</i>	<i>- Doorways should have a clear minimum opening width of 800mm.</i>

## **5.7 EC Passenger Rights Regulation**

**5.7.1** *Operators are reminded that Regulation (EU) 1177/2010 on maritime passenger rights may apply to their operation. This may require, as applicable, information regarding passenger rights must be displayed onboard and appropriate arrangements for the access and assistance of disabled persons and persons of reduced mobility (PRM) should be in place.*

**5.7.2** *Under that Regulation (EU) 1177/2010 on passenger rights, passengers have certain rights when travelling by air, land or sea. 'Sea' includes UK Category A to D Inland Waterways and limited distances to sea.*

*The Regulation is aimed primarily at cruise liners and larger ferries where passengers are accommodated both prior to and during their voyage and embark and disembark at transfer terminals. In many cases where passage is delayed or cancelled and accommodation and additional travel are involved then under the Regulation the carrier has a comprehensive responsibility of care to their customers.*

*The Regulation does not apply to:*

*(a) ships certified to carry up to 12 passengers;*

*(b) ships which have a crew responsible for the operation of the ship composed of not more than three persons or where the distance of the overall passenger service is less than 500 metres, one way;*

*(c) On excursion and sightseeing tours other than cruises; or*

*(d) On ships not propelled by mechanical means as well as original, and individual replicas of, historical passenger ships designed before 1965, built predominantly with the original materials, certified to carry up to 36 passengers*

- 5.7.3 *Operators should ensure that they are familiar with the requirements and application of the Regulation. It will be useful for them to be aware that the fare paying public will be generally unaware of the application of the Regulation and will have expectations regarding their ticket purchase and subsequent rights.*

## **6 Watertight Integrity**

Rationale: The ship must comply with the relevant hull construction standards of the authorised survey body that has been engaged to issue the Partial Declaration. (An authorised survey body is an MCA approved Classification Society or Seafish.) The standards included in this section specify the minimum requirements that may be accepted by the authorised survey bodies; they are not an alternative to full compliance with those bodies' standards.

### **6.1 Watertight subdivision**

- 6.1.1 Every subdivided ship shall be subdivided by bulkheads, which shall be watertight up to the bulkhead deck, into compartments the maximum length of which shall be calculated in accordance with the requirements for stability and survivability given in Section 10 of this Code. Every other portion of the internal structure which affects the efficiency of the subdivision of the ship shall be watertight, and shall be of a design which will maintain the integrity of the subdivision.
- 6.1.2 The stern gland of every subdivided ship shall be situated in a watertight shaft tunnel or other watertight space.
- 6.1.3 Regardless of whether a ship is subdivided or not, on every ship that has through hull penetrations that the surveyor considers to provide an increased risk of failure or water ingress, the through hull fitting should be situated in a watertight space. In particular, special attention should be made to drive shafts or other rotating machinery.
- 6.1.4 Where access to the machinery space is not possible without leaving the interior of the ship, such as amphibious vessels or others with an engine space inaccessible during normal operation, the means of access and of cooling and ventilation of the machinery compartment should be specially considered with regard to means of sealing the space watertight to avoid water ingress during waterborne operation and, for APVs, during entry into water.

### **6.2 Weatherdeck**

- 6.2.1 On a subdivided ship which operates in Category C or D waters the bulkhead deck, and any enclosed superstructure which is protecting openings on the bulkhead deck shall be weathertight. All openings in an exposed weathertight deck, including ventilators and air pipes, shall have

coamings of a height specified in table 6.2 below and shall be provided with efficient and rapid means of closing so as to make them weathertight. Freeing ports and scuppers shall be fitted as necessary for rapidly clearing the weatherdeck of water under all weather conditions.

- 6.2.2 Spaces below weatherdeck or gunwale level in ships or spaces not provided with a weathertight deck shall be considered to be liable to swamping in survivability calculations.

**Table 6.2**

<b>Access</b>	<b>Coaming height (mm)</b>
Direct to machinery space	380
To accommodation on a lower deck	230
To accommodation on the same deck* *May be dispensed with where there are no stability or downflooding risks.	100

### **6.3 Partial Subdivision Above the Bulkhead Deck**

- 6.3.1 On subdivided ships all reasonable and practicable measures shall be taken to limit, where necessary, the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs. Where such partial watertight bulkheads and webs are fitted on the bulkhead deck, above or in the immediate vicinity of main subdivision bulkheads, they shall have a watertight shell and bulkhead deck connections so as to restrict the flow of water along the deck when the ship is heeled in a damaged condition. Where such partial watertight bulkheads do not coincide with the bulkheads below, the bulkhead deck between shall be made effectively watertight.

### **6.4 Marking of Valves, Doors and Mechanisms**

- 6.4.1 Suitable notices and signs shall be provided on, or in the vicinity of, all doors, valves and closing appliances relating to the damage control and watertight integrity for protection of the ship to indicate, as necessary, the procedures for operating them, the purpose of the controls and any precautions to be observed.

## **6.5 Freeing Ports and Scuppers**

- 6.5.1 Freeing ports and scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

## **6.6 Windows**

- 6.6.1 Windows located in superstructures which contribute to the stability of a sub-divided ship or in a superstructure which protects openings in the freeboard deck of a sub-divided ship are only permitted on the condition that they are fitted with, and protected by, deadlights
- 6.6.2 Windows that form part of the weathertight integrity of ships in Category C (tidal) and D shall be in accordance with Classification Society Rules, and shall be of toughened safety glass.
- 6.6.3 Windows that form part of the weathertight integrity of ships in Category A, B and Non-Tidal C may be of “Tempered glass” – toughened safety glass which may not have been tested in accordance with ISO 614, nor marked as such. Glass shall however be in accordance with ISO 12216.
- 6.6.4 Windows that do not form part of the weathertight integrity of a ship, but provide protection and comfort to persons onboard shall be of the tempered glass type, such that it is unlikely to cause injury if it shatters.

**Note.** Where exceptionally, the standards referred to above overlap with other standards that are external to this Code, then the more onerous standard/s should be used.

## **6.7 Routine Inspections for Watertight Integrity**

- 6.7.1 All deadlights, watertight doors, valves and closing mechanisms of scuppers shall be opened and closed at intervals of not more than seven days.
- 6.7.2 All closing appliances and devices relating to the damage control or watertight integrity for protection of the ship shall be inspected by a person appointed by the master for that purpose at intervals of not more than seven days, or if the ship has been out of service for more than seven days, before it proceeds on any voyage.

- 6.7.3 The master shall be provided with a diagram of the hull to include information on the location, size and type of any hull penetrations to include information on the means of closure.
- 6.7.4 A record of any inspection shall be kept as part of the Safety Management System.
- 6.7.5 For those types of operation where ships remain out of the water for a period of time, and are launched with passengers onboard, then a check of all hull fittings and safety equipment shall be carried out daily, before first entering the water.

## **7 Machinery**

Rationale: The ship must comply with the relevant machinery standards of the Classification Society (or Seafish) that has been engaged to issue the Partial Declaration. The standards included in this section specify minimum requirements the Classification Society or Seafish standards must satisfy; they are not an alternative to full compliance with Classification Society or Seafish requirements.

### **7.1 Machinery Requirements**

- 7.1.1 The machinery, boilers and other pressure vessels, associated piping systems and fittings shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board, with due regard being paid to moving parts, hot surfaces and other hazards. The design shall have regard to the materials used in construction, the purpose for which the equipment is intended, the working conditions to which it will be subjected and the environmental conditions on board.
- 7.1.2 Any propulsion systems not adequately covered by the Classification Society rules or Seafish standards such as electrical, solar, horse drawn or sail-powered ships shall be considered by the MCA on a case by case basis.

### **7.2 Control of Propulsion Machinery**

- 7.2.1 New ships built on or after 1 January 2018, operating in Category C and D waters, shall meet the following requirements.
  - 7.2.1.1 Under all sailing conditions, including manoeuvring, the speed, direction of thrust and, if applicable, the pitch of the propeller, shall be fully controllable from the navigating bridge. Such remote control shall be performed by a separate control device for each independent propeller, with automatic performance of all associated services, including, where necessary, means of preventing overload of the propulsion machinery.
  - 7.2.1.2 The main propulsion machinery shall be provided with an emergency stopping device on the navigating bridge which shall be independent of the navigating bridge control system.



- 7.2.1.3 Remote control of the propulsion machinery shall be possible only from one location at a time; at such locations interconnected control positions are permitted. At each location there shall be an indicator showing which location is in control of the propulsion machinery. The system shall include means to prevent the propelling thrust from altering significantly when transferring control from one location to another.
- 7.2.1.4 It shall be possible for all machinery essential for the safe operation of the ship to be controlled from a local position, even in the event of failure in any part of the automatic or remote control systems.
- 7.2.1.5 If fitted with Air Starting of propulsion, an alarm shall be provided to indicate low starting air pressure set at a level which still permits starting operations of the propulsion machinery.
- 7.2.3.6 At least essential parameters such as propeller speed, oil and water pressure, cooling water temperature, fuel supply, electrical power and air pressure, as necessary, shall be displayed on the navigating bridge to the satisfaction of the Surveyor.

### **7.3 Means of manoeuvring and going astern**

Rationale: The stopping distance and manoeuvrability is not quantified as this will be dependent on the type of ship, speed and operating environment. The ship must be capable of stopping and also capable of returning to recover a person from the water within an acceptable period of time and within a safe distance.

- 7.3.1 Every ship shall have sufficient power for manoeuvring and going astern to secure proper control of the ship in all normal circumstances.
- 7.3.2 The ability of the machinery to reverse the direction of thrust in sufficient time so as to bring the ship to rest from maximum ahead service speed shall be demonstrated and recorded. The ship shall be capable of stopping within a safe distance, to be determined by the Surveyor, with due regard to the operating environment.

- 7.3.3 The effective operation of any supplementary means of stopping or manoeuvring the ship shall be demonstrated and recorded.

#### **7.4 Steering Gear**

- 7.4.1 Every ship shall be provided with an efficient main and auxiliary steering gear appropriate for the category of water the ship is certified to operate on. The main steering gear and the auxiliary steering gear shall be arranged so that the failure of one of them will not render the other one inoperative. The auxiliary steering gear shall be capable of being rapidly brought into action and shall be of adequate strength and of sufficient power to enable the ship to be steered at navigable speed. Consideration may be given to alternative means of steering such as motor control on multi-engined ships, to the satisfaction of the surveyor.
- 7.4.2 Means of communication shall be provided to enable orders to be transmitted from the bridge to any alternative steering position.

#### **7.5 Means for Stopping Machinery, Shutting Off Flammable Oil Supply Pipes, Pumps and Closing of Openings**

- 7.5.1 Means shall be provided -
- (1) for stopping ventilating fans serving machinery and accommodation spaces;
  - (2) for closing all doorways, ventilators, and other openings to such spaces (also see 15.6.1 in relation to machinery spaces); and
  - (3) to permit the release of smoke from machinery spaces.
- 7.5.2 Such means shall be capable of being operated from positions outside the said spaces and which would not be made inaccessible by a fire within such spaces.
- 7.5.3 Means shall be provided for shutting off fuel, lubricating oil and hydraulic oil supplies and associated pumps. This shall be readily accessible, situated outside the machinery space and shall be clearly labelled.
- 7.5.4 The means of stopping machinery, shutting off flammable oil supply pipes, pumps and closing of openings, for other types of propulsion shall be considered, on a case by case basis, to the satisfaction of the MCA.

## **7.6 Fuel and associated pipework**

### **7.6.1 Flash point of fuel**

Any oil fuel used in boilers or machinery shall have a flash point of not less than 55°C (closed test).

7.6.2 Where it is proposed to use other low flash point fuels, i.e. Liquified Petroleum Gas (LPG) or Liquified Natural Gas (LNG) or hydrogen the operator should contact the MCA for guidance early in the project, and the proposal shall be supported by a detailed risk assessment. The MCA will need to be satisfied that an appropriate level of safety is provided, which shall include the machinery installation being approved by a UK authorised Classification Society listed in 4.3, and being in general compliance with DfT standards. The fuel transportation, carriage storage ashore, and refuelling operations shall be in accordance with Health and Safety Executive requirements, and other relevant guidelines.

### **7.6.3 Oil fuel pipes**

(1) Fuel lines should be run in rigid, metal pipework unless permitted otherwise. Oil fuel pipes which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom, should be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned, easily accessible from a permanently manned control position, in the event of a fire occurring in the space in which such tanks are situated. Such a cock or valve is also required if there is a risk of tank contents syphoning out of the tank through pipes connected at the top of the tank.

(2) Oil fuel pipes shall have their valves and fittings (including filters) constructed of steel or other approved material. This is to provide at least a 30 minutes fire protection.

(3) Oil fuel pipes shall not be located immediately above or near units of high temperature, including boilers, steam pipelines, exhaust manifolds, silencers. As far as practicable, oil fuel lines shall be

arranged far apart from hot surfaces, electrical installations or other sources of ignition and shall be screened or otherwise suitably protected to avoid oil spray or oil leakage onto the sources of ignition. The number of joints in such piping systems shall be kept to a minimum. Heated surfaces, particularly the exhaust systems and exposed indicator cocks of main and auxiliary diesel engines, must be effectively insulated, so that the surface temperature is below 220°C.

#### **7.6.4 Flexible fuel pipes**

- (1) Fuel lines shall be run in rigid, metal pipework unless permitted otherwise. Minimum lengths of flexible hoses may be used where necessary to allow for relative movements and vibration between machinery and fixed piping systems. The hoses and any couplings shall be suitable for the intended purpose.
- (2) Flexible pipes and end attachments shall be of approved fire resisting materials of adequate strength which provide at least A30 fire protection. Where oil cannot escape from a tank through a damaged fuel pipe, the tank can be easily shut off from the control position, the machinery space concerned is protected by the fixed fire fighting, detection and protection requirements in full compliance with Section 19 then this requirement can be relaxed but flexible pipework shall at least comply with ISO 7840.
- (3) Documentary evidence shall be provided to show the pipework complies with the relevant standards.
- (4) Flexible fuel pipework shall be installed in accordance with the manufacturer's instructions and correctly supported. The pipework shall be provided with sufficient free movement to accommodate vibration and to avoid contact with any structure. Where protective sleeves are fitted, the sleeve shall extend beyond the flexible section of the pipe, with appropriate leak proof end connections.
- (5) Flexible fuel pipework shall be renewed according to the pipe manufacturer's instructions. Records of the most recent pipe renewal shall be kept onboard and ashore, where practicable.

#### 7.6.5 High pressure fuel lines

- (1) Flexible pipes are not acceptable for use in high pressure fuel injection systems.
- (2) All external high pressure fuel delivery lines between the high pressure fuel pumps and fuel injectors of engines with a power equal to or more than 375 kW shall be protected with a jacketed piping system capable of containing fuel from a high pressure line failure. A jacketed pipe incorporates an outer pipe into which the high-pressure fuel pipe is placed forming a permanent assembly. The jacketed piping system shall include a means for collection of leakages and arrangements shall be provided for an alarm to be given of a fuel line failure.
- (3) In multi-engine installations which are supplied from the same fuel source, means of isolating the fuel supply and spill piping to individual engines, shall be provided. The means of isolation shall not affect the operation of the other engines and shall be operable from a position not rendered inaccessible by a fire on any of the engines.
- (4) If an engine under 375 kW is designed and installed so that there are no surfaces having a temperature exceeding 220°C, and this can be verified by acceptable evidence/inspection, then an enclosure to prevent spray from a damaged high-pressure fuel line is not necessarily required. When approving such an installation, care should also be taken to ensure that there is no other equipment in the machinery space that may be a source of ignition if impinged by a fuel spray, e.g. electric motors, switches, etc. Where an engine manufacturer is unable to supply a jacketed high-pressure fuel piping system, any alternative arrangement provided must meet an equivalent level of safety, such as IACS Unified Interpretation SC 189. Such an installation may be accepted by the MCA.
- (5) Components of a diesel engine fuel system shall be designed considering the maximum peak pressure which will be experienced in service, including any high-pressure pulses which are generated and transmitted back into the fuel supply and spill lines by the action of fuel line injection pumps. Connections within the fuel supply and spill lines shall be constructed having regard to their ability to prevent pressurised

oil fuel leaks while in service and after maintenance.

## **8 Electrical Arrangement**

Rationale: The ship must comply with the relevant electrical standards of the Classification Society, or Seafish, that has been engaged to issue the Partial Declaration. The standards included in this section specify minimum requirements the Classification Society or Seafish standards must satisfy; they are not an alternative to full compliance with Classification Society or Seafish requirements.

### **8.1 Electrical requirements**

- 8.1.1 The electrical equipment and installations (including any electrical means of propulsion) shall be such that the ship and all persons onboard are protected against electrical hazards.
- 8.1.2 The electrical equipment and installations shall be maintained to ensure the ship is in an operational and habitable condition.
- 8.1.3 The main source of electrical power may be driven by auxiliary or the main propulsion engine. It shall be capable of illuminating any part of the ship normally accessible to and used by the passengers or crew, and provide power to main electrical systems, which shall operate without recourse to the emergency source of power.

### **8.2 Emergency power**

- 8.2.1 Additionally, emergency power shall be provided to supply the following where required by this Code:
  - (a) navigation lights;
  - (b) audible warning devices;
  - (c) emergency lighting;
  - (d) fixed VHF installations;
  - (e) alarm and public address systems;
  - (f) searchlights;
  - (g) fire alarm system;
  - (h) other safety equipment such as automatic pressurised sprinkler systems or fire pumps (unless supplied by mechanical power);
  - (i) bilge pumping systems (unless supplied by mechanical power);
  - (j) electronically powered signage where fitted;
  - (k) steering (unless mechanically powered);

- (l) alternative means of starting propulsion engine/s (unless mechanically powered);
- (m) fluxgate compass, where fitted; and
- (n) survival craft launching system, where appropriate.

8.2.2 The following are admissible for use as an emergency power source:

- (1) auxiliary generator sets with their own independent fuel supply and independent cooling system which, in the event of a power failure, start and take over the supply of power within 45 seconds automatically or, if they are located in the immediate vicinity of the wheelhouse or any other location permanently manned by crew members, can be brought into operation within 45 seconds; or
- (2) accumulator batteries, which, in the event of a power failure, connect automatically or, if they are located in the immediate vicinity of the wheelhouse or any other location permanently manned by crew members, can be connected manually. Accumulator battery banks shall be capable of being isolated.
- (3) to enable the crew to undertake (1) or (2) above, emergency battery lighting shall be provided in way of the emergency means of power supply described. This may be by the use of torches stowed in a readily accessible place nearby.
- (4) All ships other than those ships covered by 8.2.2(5) below shall be compliant with this sub-paragraph. The emergency means of power provided in accordance with (1) or (2) above shall be capable of powering the items listed in 8.2.1 for a projected operating period of at least 60 minutes without refuelling or recharging. Where accumulator batteries are employed there shall not be an unacceptable voltage reduction throughout the projected operating period.
- (5) Where the ship operates solely on Category A and/or B waters and is never further than 80 metres from an accessible bank where passengers could be evacuated should the need arise, the emergency means of power provided in accordance with (1) or (2) above shall be capable of powering the items listed in 8.2.1 for a projected operating period of at least 30 minutes without refueling or



recharging. Where accumulator batteries are employed there shall not be an unacceptable voltage reduction throughout the projected operating period.

8.2.3 The emergency power source and any associated switchboard plant shall be in a separate space to the main power supply. Cables feeding the electrical installations in the event of an emergency shall be installed and routed in such a way as to maintain the continuity of supply of these installations in the event of fire or flooding affecting the main power supply. Unless emergency power cables are suitably protected against fire and flame to a 30 minute standard for ships of category A and B waters, and to a 60 minute standard for ships operating on category C and D waters, they shall not be routed through the main engine room, galleys or space where the main power source and connected equipment is installed, except where necessary to provide power to emergency equipment in such areas. The emergency power source shall be installed above the line of the bulkhead deck of subdivided ships and as high as possible in open ships.

8.2.4 For the following rooms and locations, emergency lighting shall be provided:

- (a) locations where life-saving equipment is stored and where such equipment is normally prepared for use;
- (b) escape routes, access for passengers, including gangways, entrances and exits, connecting corridors, lifts and accommodation areas companionways, cabin areas and accommodation areas;
- (c) markings on the escape routes and emergency exits;
- (d) in other areas intended for use by persons with reduced mobility;
- (e) operation rooms, engine rooms, steering equipment rooms and their exits;
- (f) wheelhouse;
- (g) spaces containing the emergency power supply source other than battery lockers;
- (h) points at which extinguishers and fire extinguishing equipment controls are located; and
- (i) areas in which passengers, shipboard personnel and crew muster in the event of danger.

Emergency lighting may be in the form of supplementary lighting having a self-contained source of power (eg battery-powered torches).

## **8.2.5 Catamaran Emergency Source of Electrical Power**

Rationale: The requirements of section 8.2.3, that the emergency source of electrical power is located above the bulkhead deck, is intended to ensure that it is not immediately put out of action by a flooding incident, and that there is a safe access to it should it need attention, even during an emergency.

8.2.5.1 This requirement can be considered to be fulfilled on a catamaran ship with twin electrical generators, one in each hull, provided that –

- (1) The ship is decked and subdivided;
- (2) The machinery spaces containing each generator have a longitudinal bulkhead between so that the hulls are separate spaces;
- (3) They are to be enclosed by A class divisions insulated to A30 standard or equivalent;
- (4) Divisions and bulkheads surrounding these machinery spaces are to be watertight;
- (5) The freeboard to the machinery space access, on the intact side, shall not be less after damage than the minimum intact freeboard required, and the machinery space shall have a coaming as required by section 6.2, to ensure safe access to the generator after damage on the opposite side; and
- (6) The emergency switchboard shall be located in a position not susceptible to flooding when the ship is damaged.

## **9 Bilge Pumping**

Rationale: The ship must comply with the relevant bilge pumping standards of the Classification Society, or Seafish, that has been engaged to issue the Partial Declaration. The standards included in this section specify minimum requirements the Classification Society or Seafish standards must satisfy; they are not an alternative to full compliance with Classification Society or Seafish requirements.

The purpose of this section is to provide a means to pump out any water leaking into the ship as result of minor damage or as a result of failure of the watertight integrity of through hull fittings. It is not intended to protect against catastrophic flooding of a main compartment but to be able to control progressive flooding for example resulting from leaking watertight bulkheads and bulkhead fittings.

### **9.1 General**

- 9.1.1 An efficient bilge pumping system shall be provided, capable of pumping from and draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from sealed tanks/spaces (which may be vented to deck). Where these are used only for stability purposes and where the lowest point of the tank is above bilge wells/highest level bilge level, it may be drained by weighted lever cocks, fitted with non-return devices, and which are normally closed.
- 9.1.2 Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.
- 9.1.3 All bilge pipes used in or under fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other suitable material.

### **9.2 Fixed Bilge Pumping Requirements**

- 9.2.1 All ships shall be provided with at least two fixed and independently powered pumps. One of these units may be worked from the main engines, and the other is to be independently driven (if electrically driven,

supplied by the emergency source of power), and one of which may be the fire pump required by section 15.1.2. They shall not be installed within the same space. Suction pipes shall be arranged so that any compartment can be effectively drained, other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from buoyancy spaces.

- 9.2.2 For multi-hull craft, the power bilge pumping units in 9.2.1 are to take suction from the bilge main in each hull. Where the bilge system in each hull is entirely separate, at least two power bilge pumping units are to be provided in each hull.

### **9.3 Bilge Valves**

- 9.3.1 All manifolds and valves fitted in connection with the bilge pumping arrangements shall be located in positions which are readily accessible at all times under normal circumstances. If in any such ship there is only one system of bilge pipes common to all such pumps, the necessary valves for controlling the bilge suctions shall be capable of being operated from above the ship's bulkhead deck.
- 9.3.2 Every valve which is required by this Code to be operated from above the bulkhead deck shall have its means of control, at its place of operation, clearly marked to show the purpose it serves and how it may be opened and closed. It shall be provided with a means to indicate whether it is open or closed.

### **9.4 Requirements for bilge pumps and bilge suctions**

- 9.4.1 Every bilge pump provided shall be self-priming.
- 9.4.2 Each bilge pump shall be of a capacity of not less than the fire pump to ensure the ship is capable of discharging fire-fighting water of at least at the rate of input in a fire scenario. Where a fire pump is not required for ships operating in Category A waters, the bilge pump capacity shall be calculated in accordance with the equation detailed in 15.1.2.
- 9.4.3 Each independent power bilge pump shall have a direct suction from the

space in which it is situated, provided that not more than two direct suctions shall be required in one space. Where two or more such suctions are provided in a single space, they shall be positioned on either side of the ship or space. Direct suctions in a machinery space shall be of a diameter not less than that required for the bilge main.

- 9.4.4 All fixed bilge suctions shall be fitted with readily accessible strainers so that they may be regularly checked and cleaned.

## **9.5 Arrangement of bilge pipes**

- 9.5.1 All bilge suction piping up to the connection to the pumps shall be independent of other piping, except in the case where the pump is used for both fire fighting and bilge pumping and a section of the piping is required to serve both functions. All bilge pipes shall be of steel or equivalent material.
- 9.5.2 Bilge suction pipes shall not be led through oil tanks except in the case of double bottom tanks. Where bilge suction pipes pass through water tanks, such pipes shall be of heavy gauge and pipe joints shall be of the fully welded type, however, the number of pipe joints shall be kept to a minimum.

## **9.6 Alternative means of compliance for small ships**

- 9.6.1 Where the surveyor is satisfied that the fitting of a bilge main is not practical, the requirements of 9.1 to 9.5 may be satisfied by the use of individual submersible pumps. Such submersible pumps shall be capable of both automatic (except in machinery spaces) and manual operation and clear indication shall be provided on the navigating bridge when pumps operate
- 9.6.2 This does not relieve such ships of the requirement for at least two independent means of draining every compartment. The alternative means may be by provision of portable engine driven or submersible type electric pump with flexible discharge line, capable of being operated from main or emergency power via a wandering lead.
- 9.6.3 The failure of the main propelling machinery shall not render bilge pumping inoperable and a second independent system should be

provided if the ship is not subdivided and relies on internal buoyancy from foam or tanks to remain afloat in the case of flooding.

## **9.7           Precautions against flooding through bilge pipes**

- 9.7.1   The bilge pumping systems shall be so arranged as to prevent external water passing into any part of the ship. The bilge connection from any pump which also has an external suction, or suction from the ballast system, shall be fitted with a non-return valve.
- 9.7.2   Provision shall be made to prevent the flooding of any watertight compartment served by a bilge suction pipe by means of non-return valves in the event of the pipe being severed or otherwise damaged in any compartment through collision or grounding. Where any part of such pipe is situated nearer to the side of the ship than one-fifth of the breadth of the ship (such a distance being measured at right angles to the centre line of the ship at the level of the deepest subdivision load waterline), or in any duct keel, a non-return valve shall be fitted to the pipe in the watertight compartment containing the open end of the pipe.

## **9.8           Bilge Alarms**

- 9.8.1   A bilge alarm shall be fitted;
- (1)   in any compartment containing propulsion machinery; and
  - (2)   in any other compartment likely to accumulate bilge water.
  - (3)   The alarm shall provide an audible warning, and a separate visual warning, for each protected space at the control position. Once activated the audible alarm shall continue to sound until acknowledged.

## 10 Intact and Damage Stability Criteria

Rationale: The ship shall have appropriate stability for its intended area of operation and the risks that are associated with its intended operation, including the number of people that are intended to be carried.

### 10.1 Intact Stability

The intact stability requirements are dependent on the area of operation and the number of passengers onboard. The table below indicates which requirements apply to each ship type and provide the reference to the relevant paragraphs in this section.

**Table 10.1**

Water Category	Maximum Number of Passengers	Number of Decks	Applicable Standards	Section Reference
A or B	≤60*	0 or 1	Heel Test	10.1.1
A or B	≤60*	>1	Righting Lever Criteria	10.1.2
A or B	>60*	Any		
C	≤60*	0		
C or D	Any	≥1	Righting Lever Criteria, Heel on Turn, Severe Wind Rolling Criterion (SWRC)	10.1.2, 10.1.3 & 10.1.4

#### **Notes:-**

In the “Decks” column in the above table,

“0” means a ship which is completely open, as depicted in Annex 7.

“1” means a partially or fully decked ship.

“>1” means a partially or fully decked ship arranged with additional passenger decks at a higher level.

\* The aggregate number of passengers and crew shall not exceed 63. This rationale is based on the assessment of essential crew in Annex 2.

### 10.1.1 Heel Test Standard

- (1) A heel test shall be undertaken to determine that the angle of heel does not exceed  $7^\circ$  with a specified imposed passenger heeling moment, in accordance with the heel test procedure given in MCA Instructions for the Guidance of Surveyors, MSIS 09 – Approval of Stability, Chapter 1, Annex 2 – Heeling Test Process (as amended).
- (2) Alternatively, for ships having sufficient information available such as a lines plan, hydrostatics and righting arm curves, the physical heel test may be waived at the Surveyor's discretion and the requirements of paragraph 10.1.1(1) demonstrated by calculation.
- (3) For APV, weight checks may be undertaken using a certified weighbridge.

### 10.1.2 Righting Lever Criteria

A ship required to comply with the righting lever criteria shall meet the applicable method of compliance from (i) or (ii) and must meet (iii).

- (1) **(i) Ships operating in category A and B waters, or open ships in category C waters.**

The area under the righting lever curve (GZ curve) shall not be less than 0.055 metre-radians up to  $\varphi = 30^\circ$  angle of heel. The angle of downflooding shall be at least  $30^\circ$ .

- (ii) Ships with  $\geq 1$  deck operating in category C waters, or in category D waters.**

The area under the righting lever curve (GZ curve) shall not be less than 0.055 metre-radians up to  $\varphi = 30^\circ$  angle of heel and not less than 0.09 metre-radians up to  $\varphi = 40^\circ$  or the angle of down-flooding  $\varphi_f^1$  if this angle is less than  $40^\circ$ . Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of  $30^\circ$  and

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<sup>1</sup>  $\varphi_f$  is an angle of heel at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open.



40° or between 30° and  $\varphi_r$ , if this angle is less than 40° shall not be less than 0.03 metre-radian. The angle of downflooding shall be at least 30°.

**(iii) All ships required to meet the righting lever criteria.**

- (2) The righting lever GZ shall be at least 0.20 metres at an angle of heel equal to or greater than 30°.
- (3) The maximum righting lever shall occur at an angle of heel not less than 30°. This angle may be permitted to be reduced to 25° having regard to the design of a particular ship.
- (4) The following shall be applied where a ship's characteristics render compliance with the criterion of 10.1.2 (3) impracticable:

The area under the curve of righting levers (GZ curve) shall not be less than 0.070 metre-radians up to an angle of 15° when the maximum righting lever (GZ) occurs at 15° and 0.055 metre-radians up to an angle of 30° when the maximum righting lever (GZ) occurs at 30° or above. Where the maximum righting lever (GZ) occurs at angles of between 15° and 30°, the corresponding area under the righting lever curve shall be:

$$0.055 + 0.001 (30^\circ - \varphi_{\max}) \text{ metre-radians}^2$$

- (5) The initial metacentric height  $GM_0$  shall not be less than 0.15 m.
- (6) The angle of heel on account of crowding of passengers to one side as defined in 10.1.5 (4) below shall not exceed 10°.

### 10.1.3 Heel on Turn

The angle of heel on account of turning shall not exceed 10° when calculated using the following formula:

$$M_R = 0.200 * \frac{v_0^2}{L_{WL}} * \Delta * \left( KG - \frac{d}{2} \right)$$

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<sup>2</sup>  $\varphi_{\max}$  is the angle of heel in ° at which the righting lever curve reaches its maximum.

where:

$M_R$  = heeling moment (kNm)

$v_o$  = service speed (m/s)

$L_{WL}$  = length of ship at waterline (m)

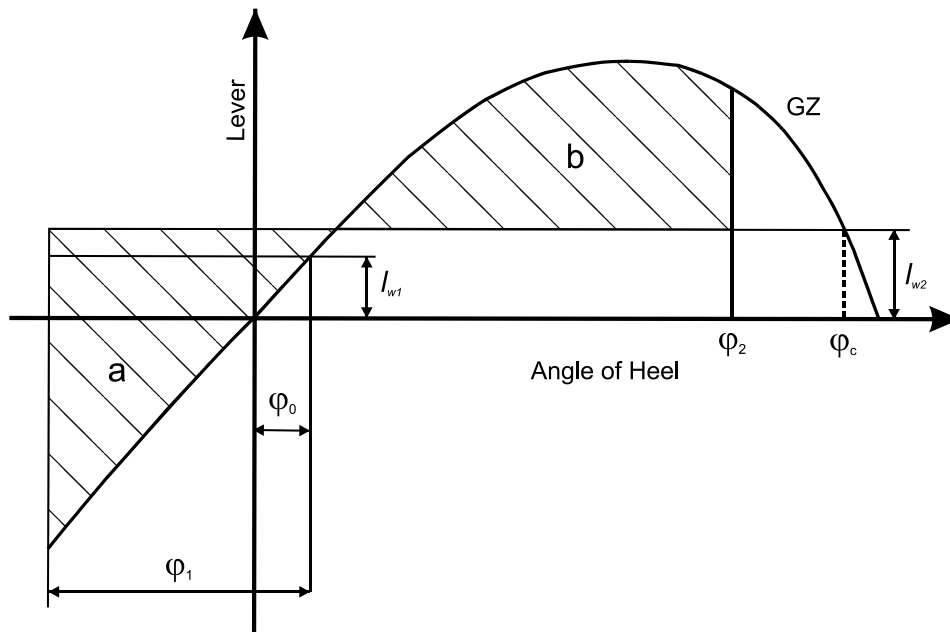
$\Delta$  = displacement (t)

$d$  = mean draught (m)

$KG$  = height of centre of gravity above baseline (m)

#### 10.1.4 Severe wind and rolling criterion (weather criterion)

- (1) The ability of a ship to withstand the combined effects of beam wind and rolling shall be demonstrated, with reference to the figure 10.1.4 as follows:
  - (a) the ship is subjected to a steady wind pressure acting perpendicular to the ship's centreline which results in a steady wind heeling lever ( $l_{w1}$ ).
  - (b) from the resultant angle of equilibrium ( $\varphi_0$ ), the ship is assumed to roll owing to wave action to an angle of roll ( $\varphi_1$ ) to windward. The angle of heel under action of steady wind ( $\varphi_0$ ) shall not exceed  $16^\circ$  or 80% of the angle of deck edge immersion, whichever is less.
  - (c) the ship is then subjected to a gust wind pressure which results in a gust wind heeling lever ( $l_{w2}$ );
  - (d) under these circumstances, area  $b$  shall be equal to or greater than area  $a$ ;



**Figure 10.1.4 – Severe wind and rolling**

The angles in the above figure 10.1.4 are defined as follows:

$\varphi_0$  = angle of heel under action of steady wind

$\varphi_1$  = angle of roll to windward due to wave action (see footnote 3)

$\varphi_2$  = angle of down-flooding ( $\varphi_f$ ) or  $50^\circ$  or  $\varphi_c$ , whichever is less

where:

$\varphi_f$  = angle of heel at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open.

$\varphi_c$  = angle of second intercept between wind heeling lever  $l_{w2}$  and GZ curves.

- (2) The wind heeling levers  $l_{w1}$  and  $l_{w2}$  referred to in 10.1.4 (1)(a)-(c) are constant values at all angles of inclination and shall be calculated as follows:

$$l_{w1} = \frac{P * A * Z}{1000 * g * \Delta} \quad (m) \quad \text{and}$$

$$l_{w2} = 1.5 * l_{w1} \quad (m)$$

where:

$P$  = wind pressure of 168 Pa (N/m<sup>2</sup>).

$A$  = projected lateral area of the portion of the ship and deck cargo above the waterline (m<sup>2</sup>);

$Z$  = vertical distance from the centre of  $A$  to the centre of the underwater lateral area or approximately to a point at one half the mean draught (m);

$\Delta$  = displacement (t)

$g$  = gravitational acceleration of 9.81 m/s<sup>2</sup>

- (3) Alternative means for determining the wind heeling lever ( $l_{w1}$ ) may be accepted, to the satisfaction of the MCA, as an equivalent to calculation in 10.1.4 (2). When such alternative tests are carried out, reference shall be made to the relevant part of IMO MSC.1 Circ 1200. Here the wind velocity used in the tests shall be 15 m/s in full scale with uniform velocity profile.

- (4) The angle of roll ( $\varphi_1$ )<sup>3</sup> referred to in 10.1.4 (1) (b) shall be calculated as follows:

$$\varphi_1 = 109 * k * X_1 * X_2 * \sqrt{r * s} \quad (\text{degrees})$$

where:

$X_1$  = factor as shown in table 10.1.4 (4)(a)

---

<sup>3</sup> The angle of roll for ships with anti-rolling devices should be determined without taking into account the operation of these devices unless the MCA is satisfied with the proof that the devices are effective even with sudden shutdown of their supplied power.

$X_2$  = factor as shown in table 10.1.4 (4)(b)

$k$  = factor as follows:

$k$  = 1.0 for round-bilged ship having no bilge or bar keels

$k$  = 0.7 for a ship having sharp bilges

$k$  = as shown in table 10.1.4 (4)(c) for a ship having bilge keels, a bar keel or both

“Sharp bilge” shall be considered a bilge radius  $<1\%$  breadth (B) and an angle between piecewise lines representing the bilge smaller than  $120^\circ$

$$r = 0.73 + 0.6 OG/d$$

with:

$$OG = KG - d$$

$d$  = mean moulded draught of the ship [m]

$s$  = factor as shown in table 10.1.4 (4) (d) where  $T$  is the ship roll natural period. In absence of sufficient information, the following approximate formula can be used:

$$\text{Rolling period } T = \frac{2 * C * B}{\sqrt{GM}} (s)$$

where:

$$C = 0.373 + 0.023(B/d) - 0.043(L_{wl}/100).$$

The symbols in tables 10.1.4 (4)(a), 10.1.4 (4)(b), 10.1.4 (4)(c), and 10.1.4 (4)(d), and the formula for the rolling period are defined as follows:

$L_{wl}$  = length of the ship at waterline (m)

$B$  = moulded breadth of the ship (m)

$d$  = mean moulded draught of the ship (m)

$C_B$  = block coefficient

$A_k$  = total overall area of bilge keels, or area of the lateral projection of the bar keel, or sum of these areas (m<sup>2</sup>)

$GM$  = metacentric height corrected for free surface effect (m).

**Table 10.1.4 (4)(a) – Values of factor  $X_1$** 

B/d	$X_1$
$\leq 2.4$	1.0
2.5	0.98
2.6	0.96
2.7	0.95
2.8	0.93
2.9	0.91
3.0	0.90
3.1	0.88
3.2	0.86
3.4	0.82
3.5	0.80
3.6	0.79
4.0	0.78
4.5	0.76
5.0	0.72
5.5	0.68
6.0	0.64
6.5	0.62

**Table 10.1.4 (4)(b) – Values of factor  $X_2$** 

$C_B$	$X_2$
$\leq 0.45$	0.75
0.50	0.82
0.55	0.89
0.60	0.95
0.65	0.97
$\geq 0.70$	1.00

**Table 10.1.4 (4)(c) – Values of factor  $k$** 

$\frac{A_k \times 100}{L_{WL} \times B}$	$k$
0	1.0
1.0	0.98
1.5	0.95
2.0	0.88
2.5	0.79
3.0	0.74

3.5	0.72
$\geq 4.0$	0.70

**Table 10.1.4 (4)(d) – Values of factor  $s$**

T	s
3.5	0.100
4.0	0.099
4.5	0.096
5.0	0.090
7.0	0.064
9.0	0.042
9.5	0.038
10.0	0.037
10.5	0.035

(Intermediate values in these tables shall be obtained by linear interpolation. If values lie outside of the range, see 10.1.4 (5) below or refer to MCA Stability Unit.)

- (5) The tables and formulae described in 10.1.4 (4) are based on data from ships having:
  - (a)  $B/d$  between 2.4 and 6.5;
  - (b)  $(KG/d-1)$  between -0.3 and 0.5;
  - (c) T smaller than 10.5 seconds.
- (6) For ships with parameters outside of the above limits the angle of roll ( $\phi_1$ ) may be determined with model experiments of a subject ship with the procedure described in IMO Circular MSC.1/ Circ. 1200 as the alternative. In addition, the MCA may accept such alternative determinations for any ship, if deemed appropriate.

#### **10.1.5 Assumptions for Intact Stability**

- (1) A minimum weight of 75 kilogrammes shall be assumed for each person except that this value may be increased subject to the approval of the MCA. In addition, the mass and distribution of

the luggage shall be approved by the MCA.

- (2) The height of the centre of gravity for passengers shall be assumed equal to:
  - (a) 1.0 metre above deck level for passengers standing upright. Account may be taken, if necessary, of camber and sheer of deck;
  - (b) 0.30 metres above the seat in respect of seated passengers.
- (3) Passengers and luggage shall be considered to be in the spaces normally at their disposal, on the highest decks they have access to, measured using the densities provided in 23.3 when assessing compliance with the criteria given in 10.1.2 (1) to 10.1.2 (5), above.
- (4) Passengers without luggage shall be considered as distributed to produce the most unfavourable combination of passenger heeling moment and/or initial metacentric height, which may be obtained in practice, when assessing compliance with the criteria given in 10.1.2 (6) and 10.1.3, respectively. In this regard, a value higher than four persons per square metre is not necessary.

## **10.2. Subdivision and Damage Stability**

### **10.2.1 Damage Stability Requirements**

The subdivision standard and damage stability criteria are dependent on the area of operation and the number of passengers onboard. The requirements for each ship type are summarised in the table below.



**Table 10.2.1**

<b>Water Category</b>	<b>Maximum Number of Passengers</b>	<b>Number of Decks</b>	<b>Subdivision Standard and Stability Criterion</b>	<b>Section Reference</b>
<b>A</b>	<b>Any</b>	<b>≥0</b>	<b>None</b>	<b>Intact Stability only</b>
<b>B</b>	<b>≤60*</b>	<b>≥0</b>	<b>Margin Line Residual GZ &amp; Range</b>	<b>10.2.8</b>
<b>B</b>	<b>&gt;60* &amp; &lt;400</b>	<b>≥1</b>	<b>SOLAS 1 compartment</b>	<b>10.2.2 - 10.2.7</b>
<b>B</b>	<b>≥400</b>	<b>≥1</b>	<b>SOLAS 2 compartment</b>	<b>10.2.2 - 10.2.7</b>
<b>B, C or D (see Note 4)</b>	<b>≤100</b>	<b>≤1</b>	<b>Margin Line Residual GZ &amp; Range</b>	<b>10.2.8</b>
<b>C</b>	<b>≤60*</b>	<b>≤1</b>	<b>Margin Line Residual GZ &amp; Range</b>	<b>10.2.8</b>
<b>C</b>	<b>&gt;60* &amp; &lt;400</b>	<b>≥1</b>	<b>SOLAS 1 compartment</b>	<b>10.2.2 - 10.2.7</b>
<b>C</b>	<b>≥400</b>	<b>≥1</b>	<b>SOLAS 2 compartment</b>	<b>10.2.2 - 10.2.7</b>
<b>D</b>	<b>&lt;400</b>	<b>≥1</b>	<b>SOLAS 1 compartment</b>	<b>10.2.2 - 10.2.7</b>
<b>D</b>	<b>≥400</b>	<b>≥1</b>	<b>SOLAS 2 compartment</b>	<b>10.2.2 - 10.2.7</b>

**Notes:-**

- (1) A 1-compartment subdivision standard means the ship shall be so constructed as to provide sufficient intact stability in all service conditions to enable the ship to withstand the total or partial flooding of any one of the main compartments anywhere in the length between main transverse watertight bulkheads.
- (2) A 2-compartment subdivision standard means the intact stability shall be adequate to withstand the total or partial flooding of any two

adjacent main compartments anywhere in the length including a main transverse watertight bulkhead (see also 10.2.4 below, regarding damage length).

(3) In the “Number of Decks” column in the above table,

“0” means a ship which is completely open, as depicted in Annex 7.

“1” means a partially or fully decked ship.

(4) Only applicable when the ship is restricted to operations in all cases in favourable weather, in summer, and in daylight hours.

\* The aggregate number of passengers and crew shall not exceed 63. This rationale is based on the assessment of essential crew in Annex 2.

#### 10.2.2 Subdivision Standards

The requirements for subdivision, set out at paragraphs 10.2.3 to 10.2.8 are applicable to plane subdivision only. Any other arrangements should be referred to the Stability Unit of the MCA for special consideration.

#### 10.2.3 Collision and aft peak bulkheads

(1) A forepeak or collision bulkhead shall be fitted which shall be watertight up to the bulkhead deck. This bulkhead shall be located at a distance from the forward perpendicular of not less than 5% of the length of the ship and not more than 3 metres plus 5% of the length of the ship.

(2) For ships of under 24 metres in length, this bulkhead shall be located at a distance from the forward perpendicular of not less than 3% of the length of the ship and not more than 10% of the length of the ship.

(3) Where any part of the ship below the waterline extends forward of the forward perpendicular, e. g. a bulbous bow, the distances stipulated in paragraph 1 shall be measured from a point either:

(a) at the mid-length of such extension; or

(b) at a distance 1.5% of the length of the ship forward of the forward perpendicular; or

- (c) at a distance 3 metres forward of the forward perpendicular, whichever gives the smallest measurement.
- (4) Where a long forward superstructure is fitted, the forepeak or collision bulkhead shall be extended weathertight to the next full deck above the bulkhead deck. In ships where a bow door is fitted, this extension shall be so arranged as to preclude the possibility of the bow door causing damage to the bulkhead, in the case of damage to or detachment of a bow door.
- (5) The extension required in paragraph 4 need not be fitted directly above the bulkhead below provided all parts of the extension are not located forward of the forward limit specified in paragraph 1 or in paragraph 2.
- (6) Ramps not meeting the above requirements shall be disregarded as an extension to the collision bulkhead.
- (7) An afterpeak bulkhead, and bulkheads dividing the machinery space, from the cargo and passenger spaces forward and aft, shall also be fitted and made watertight up to the bulkhead deck. The afterpeak bulkhead may, however, be stepped below the bulkhead deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished. Variations of plane bulkheads will be considered separately by the MCA.
- (8) In all cases stern tubes shall be enclosed in watertight spaces. The stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the margin line will not be submerged.

#### **10.2.4 Minimum spacing of bulkheads**

If the distance between the two adjacent main transverse bulkheads required to be watertight, or their equivalent plane bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads is less than 3 metres plus 3 per cent of the length of the ship or 11 metres, or 10 percent of the length of the ship, whichever is the least, only one of these bulkheads shall be regarded as forming part of the subdivision of the ship.

#### 10.2.5 **Cross-flooding control**

- (1) Ships shall be so constructed as to keep asymmetrical flooding, when the ship is in a damaged condition, at the minimum consistent with efficient arrangements.

Cross-flooding control arrangements shall be in accordance with IMO Resolution MSC.245(83), adopted on 12th October, 2007.

- (2) In ships fitted with cross-flooding arrangements, the fittings shall be, where practicable, self-acting but, in any case, where controls to cross-flooding fittings are provided, they shall be capable of being operated from an accessible position above the bulkhead deck.
- (3) Any cross-flooding control systems shall ensure that equalisation shall occur at an angle not exceeding 15 degrees or less, as necessary, to ensure the safety of the ship.
- (4) If the margin line may become submerged during the flooding for the assumed damage in 10.2.6, the construction of the ship shall be such as will enable the master of the ship to ensure -
  - (a) that the maximum angle of heel during any stage of such flooding will not be such as will endanger the safety of the ship; and shall not exceed 15 degrees
  - (b) that the margin line will not be submerged in the final stage of flooding.

#### 10.2.6 **Calculation of stability in the damaged condition**

The sufficiency of stability of every ship following damage and flooding shall be determined by calculation which has regard to the design and construction of the ship, and the damaged compartments, and which is in accordance with the following:

- (a) Damage calculations shall be made over the operational draught range as a basis for curves of minimum metacentric height or maximum vertical centre of gravity;
- (b) The assumed average permeabilities shall be as follows -

- (i) Accommodation spaces for passengers and crew .. 95%  
Machinery spaces. . . . . 85%  
Tanks for liquids . . . . . 0 or 95%,  
Spaces occupied by vehicular cargo . . . . . 90%  
Spaces occupied by other cargo or stores . . . . . 60%  
(whichever results in the more onerous requirements).
  
- (ii) Higher surface permeabilities shall be assumed in respect of spaces which, in the vicinity of the damaged water plane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of cargo or stores.
  
- (c) The extent of damage shall be assumed to be as follows -
  - (i) Longitudinal extent; 3 metres plus 3 per cent of the length of the ship, or 11 metres, or 10 percent of the length of the ship, whichever is less;
  
  - (ii) Transverse extent: from the ship's side to its centerline including any centerline bulkhead at the level of the deepest subdivision load waterline taken parallel to the keel. Ships with a centerline bulkhead will need to be considered in two ways – a calculation for damage through and beyond the bulkhead, and a calculation for damage up to but not including the bulkhead, in accordance with the “lesser extent of damage” provision in 10.2.6(c)(iv). Ships with wing boundaries, e.g. B/5 bulkheads or wing tanks, need calculations assuming damage to the outboard and centreline spaces, leaving the space on the side undamaged intact, maximizing the heel effect;
  
  - (iii) vertical extent; from the base line upwards without limit;
  
  - (iv) if any damage of lesser extent than that indicated in subparagraphs (i), (ii) and (iii) would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed for the purposes of the calculation.
  
  - (v) forward damage on catamarans shall be considered to extend to

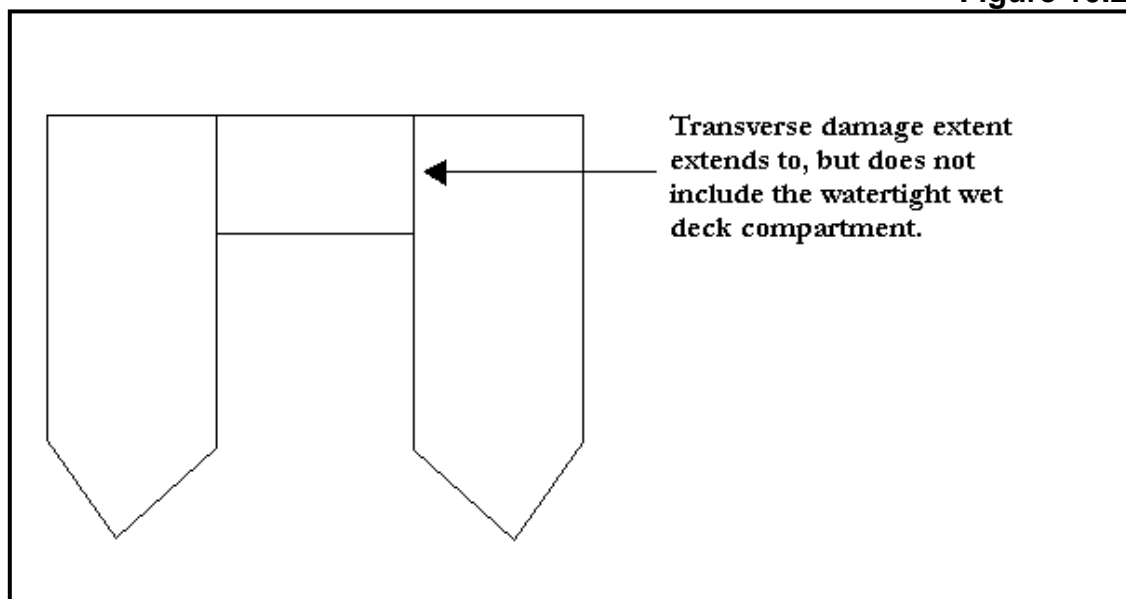
the collision bulkhead of both hulls.

(vi) grounding damage on catamarans shall be considered to flood one compartment in each hull.

(d) Where the ship is fitted with decks, inner skins or longitudinal bulkheads of sufficient tightness to restrict the flow of water, regard shall be had to such restrictions in the calculation.

(e) When considering transverse damage on multihulls, catamarans need only be considered to have damaged one hull, provided the two hulls are totally independent, and that there are not cross connections that, if damaged would flood the other hull and wet deck compartment. See Figure 10.2.6. Trimarans should be considered to have damaged wing and centre compartments.

**Figure 10.2.6**



### **10.2.7 Standard of stability in the damaged condition**

The stability of the ship shall be deemed to be sufficient if the calculations in section 10.2.6 show that, after the assumed damage, the condition of the ship is as follows:

(1) In the final stage after damage, and after equalisation where provided -

- (a) the positive residual righting lever curve has a range of at least 15 degrees beyond the angle of equilibrium; this range may be reduced to a minimum of 10 degrees in the case where the area under the righting lever curve is that specified in subparagraph 1(b) is increased by the ratio 15/Range, where Range is expressed in degrees;
- (b) the area under the righting lever curve is at least 0.015 metre-radians, measured from the angle of equilibrium to the lesser of:
  - (i) the angle at which progressive flooding occurs;
  - (ii) 22 degrees (measured from the upright) in the case of one compartment flooding, or 27 degrees (measured from the upright) in the case of simultaneous flooding of two or more adjacent compartments;
- (c) a residual righting lever (GZ) value, is to be obtained within the range specified in subparagraph (1)(a), when determined by the formula -

$$GZ(m) = \frac{\text{heeling moment}(t.m)}{\text{displacement}(t)} + 0.04$$

where the heeling moment is to be taken as the greatest value resulting from any one of the following effects -

- (i) the crowding of all passengers towards one side of the ship allowing 0.25 square metres per passenger;
- (ii) the launching of all fully loaded davit-launched survival craft on one side of the ship;
- (iii) the pressure of the wind on one side of the ship;

where in no case shall the GZ value so determined be less than 0.10 metres;

- (d) for the purpose of calculating the heeling moments in subparagraph (1)(c), the following assumptions shall be made -

- (i) moments due to crowding of passengers -
  - (aa) 4 persons per square metre;
  - (bb) a mass of 75 kilogrammes for each passenger;
  - (cc) passengers shall be distributed on available deck areas towards one side of the ship on the decks where muster stations are located and in such a way that they produce the most adverse heeling moment;
- (ii) moments due to launching of all fully loaded davit-launched survival craft on one side -
  - (aa) all lifeboats and rescue boats fitted on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out fully loaded and ready for lowering;
  - (bb) for lifeboats which are arranged to be launched fully loaded from the stowed position, the maximum heeling moment during launching shall be taken;
  - (cc) a fully loaded davit-launched liferaft attached to each davit on the side to which the ship has heeled after having sustained damage shall be assumed to be swung out ready for lowering;
  - (dd) persons not in the life-saving appliances which are swung out shall not provide either additional heeling or righting moment;
  - (ee) life-saving appliances on the side of the ship opposite to the side to which the ship has heeled shall be assumed to be in a stowed position;
- (iii) moments due to wind pressure -
  - (aa) a wind pressure of  $80\text{N/m}^2$  (Pa) to be applied;
  - (bb) the area applicable shall be the projected lateral area of the ship above the waterline corresponding to the intact condition;
- (e) in intermediate stages of flooding, or during equalisation where applicable, the maximum righting lever shall be at least 0.05 metres and the range of positive righting levers shall be at least 7 degrees. In all cases only one breach in the hull and only one



free surface need be assumed;

- (2) The final condition of the ship after damage and, in the case of asymmetrical flooding, after equalisation measures have been taken shall be as follows –
  - (a) in the case of symmetrical flooding there shall be a positive residual metacentric height of at least 50 mm as calculated by the constant displacement method;
  - (b) in the case of asymmetrical flooding the angle of heel for one-compartment flooding shall not normally exceed 7 degrees. Proposals to exceed 7 degrees shall be submitted to the MCA for special consideration. Such a proposal will not be accepted if the heel angle exceeds 12 degrees. The proposal must include information which demonstrates that muster stations, evacuation routes and life-saving appliances are able to be used satisfactorily.
  - (c) in no case shall the margin line be submerged in the final stage of flooding. At intermediate stages of flooding the margin line is not to be submerged unless partial subdivision above the bulkhead deck limits sufficiently the spread of water along the bulkhead deck and results in an angle of heel not exceeding 15 degrees. In the case of ships carrying vehicles on the bulkhead deck, the angle of heel at intermediate stages of flooding shall not be greater than that which will submerge the margin line;
- (3) For the purpose of the requirements in this section -
  - (a) when major progressive flooding occurs, that is, when it causes rapid reduction in the righting lever of 0.04 metres or more, the righting lever curve is to be considered as terminated at the angle at which the progressive flooding occurs, and the range and area referred to in subparagraphs (1)(a) and (b) shall be measured to that angle; and
  - (b) in cases where the progressive flooding is of a limited nature that does not continue unabated and causes an acceptable slow reduction in righting lever of less than 0.04 metres, the

remainder of this curve shall be partially truncated by assuming that the progressively flooded space is so flooded from the beginning.

**10.2.8 Damage Stability for Undecked, Partially Decked or Single Deck Ships Operating within UK Category B and C Waters and carrying up to 60 passengers**

- (1) The ship shall be capable of remaining afloat at equilibrium with a minimum freeboard anywhere in the length of 76 mm on a decked ship (or 76 mm below the gunwale on ships without a deck or with an incomplete deck) following flooding of any internal compartment, and any compartments which may be penetrated from the shell to reach that internal compartment.
- (2) During intermediate stages of flooding, and at final equilibrium, the maximum righting lever shall be at least 0.05 metres within a range of 0 – 25 degrees and the range of positive righting levers shall be at least 7 degrees.
- (3) The determination of this requirement shall be by calculation where:
  - (a) calculations shall be made with all non-floodable tanks in either fully pressed or empty conditions (whichever is more onerous);
  - (b) calculations shall be made with all floodable tanks assumed to be flooded to their full capacity with their intended content or to be empty should this condition be possible with the ship in its flooded state (whichever is more onerous);
  - (c) in such cases it shall be assumed that any 'open' or undecked compartment is filled with water to the level of the outside waterline;
  - (d) the mass of the ship shall be that equating to its mark of least allowable freeboard and movable components of this shall be positioned so as to produce the most severe heeling moment. Passengers are not assumed to move;
  - (e) the volume of the ship contributing to buoyancy shall include all

structure and fixed equipment which is non-permeable in nature and the solid portions of permeable items.

- (4) Buoyancy fitted which is not integral to the hull shall be so contained as not to be able to become displaced in the event of damage, excepting that portion which may be within the limits of the assumed extent of damage. The strength of the buoyancy fixing arrangements shall be required to be demonstrated by calculation to ensure the buoyancy will remain in position when experiencing the full upward thrust due to the buoyancy forces.
- (5) In addition to the requirements above a ship which is assessed as an open ship but which has a deck or sole above the level of the outside waterline will require additional assessment. This additional assessment will consider the potential for water on deck, distribution of buoyancy and any required measures to ensure stability is not adversely affected by the arrangement and the ship is not vulnerable to swamping.
- (6) Special consideration may be required for large protected openings which will be below the damaged waterline e.g. lower door sills. In such cases more detailed assessment may be required to determine the resistance of the arrangements to damage and consequences of breach. This assessment may result in increased residual freeboard requirements in way of the arrangement or additional watertight boundary protection.
- (7) The freeboard requirements of (1) may be relaxed provided that all of the following criteria are met to the satisfaction of the surveyor:
  - (a) the immersed portion of the weather deck is not a life saving appliance storage area;
  - (b) it is not part of an assembly station, evacuation point or part of an evacuation route; and
  - (c) that no more than 10% L of the deck edge on the damaged side is immersed in the process, and that negative freeboard measured from the deck edge is limited to a maximum of 300 mm.
- (8) Alternatively to calculation, damage stability may be demonstrated by practical test, in the swamped condition (ship complete, with

simulated full load, fuel, fluids persons simulated at 75 Kg each, tyres fully inflated (for APV), and eliminating as far as practical any air pockets from areas where they may become trapped) and floating at equilibrium following the worst possible flooding of the passenger space or combination of passenger space and one under deck compartment) and with a load equivalent to a righting lever of 0.05m at the gunwale there should be at least 7 degrees range of positive stability beyond the equilibrium angle. The residual freeboard requirements of (1) must also be met.

### **10.3 Stability Information**

- 10.3.1 Ships complying with the heel test requirements of 10.1.1 shall be issued with a heel test report.
- 10.3.2 In order to establish where the centre of gravity is on all ships other than heel test ships, an inclining test or hull form analysis will be required and the elements of it's stability determined to demonstrate compliance with the requirements of 10.1 and 10.2. The inclining test shall be in accordance with the inclining test procedure given in MCA Instructions for the Guidance of Surveyors, MSIS 09 – Approval of Stability, Chapter 1, Annex 3 – Inclining Test Process. The stability information shall be submitted to the MCA for approval. The master shall be supplied by the owner with approved information relating to the stability of the ship.
- 10.3.3 Every ship complying with the requirements of 10.2.8 on completion shall have its stability information submitted to the MCA for approval.
- 10.3.4 Full stability information shall be submitted to the MCA for a full independent stability check.
- 10.3.5 All ships shall keep a written record of stability information onboard.

### **10.4 Subsequent Stability Verifications**

- 10.4.1 Heel test ships and ships assessed for Margin Line, Residual GZ and Range
  - (1) The stability of the ship is required to be reconsidered every 5 years either by repeating the heel test or undertaking a lightship survey,

provided the lightship survey undertaken at the previous heel test was well documented and the freeboard measurements recorded. The owner must also prepare and sign a declaration to verify no changes have been made to the ship in the intervening period.

- (2) The ship shall be placed in the same “light” condition as recorded. The upright freeboards shall be re-recorded and compared with the previous values. Should the result be the same then the ship is deemed to be unchanged and the stability is accepted for a further five years. Due to measurement errors freeboards are considered unchanged if within 3 centimetres of the original figures at the bow and stern and 2 centimetres at the amidships measuring point. Slightly larger figures may be accepted if reasons for the change can be accounted for. However, if the change in freeboard exceeds these margins and cannot be accounted for (thereby indicating an increase in the lightship displacement) then the heeling test must be repeated.
- (3) Every inclining or lightship survey or tests made for this purpose or for the purpose of this section of the Code shall be carried out in the presence of an MCA surveyor.

#### **10.4.2 Subdivided Ships**

- (1)
  - (i) In each period of five years every subdivided ship shall have a lightship survey, to verify any changes in lightship displacement and longitudinal centre of gravity.
  - (ii) Such periods shall commence on the date of issue of either a Passenger Certificate or from a previous inclining or lightship survey, whichever date is earliest.
  - (iii) The ship shall be re-inclined whenever, in comparison with the ship's approved stability information derived from the previous inclining experiment, a deviation from the lightship displacement exceeding 2% or a deviation of the longitudinal centre of gravity exceeding 1 per cent of the ship's length is found or anticipated.
  - (iv) The owner or their representative is responsible for arranging and conducting the tests.

- (v) The interval between the lightship surveys or tests of any such ship may be extended for a period of not more than one year if, on the production of relevant information about the ship, it can be shown that the lightship survey or test is not necessary at the required interval.
- (2) An approved report of each inclining or lightship survey or test carried out in accordance with this Code and of the calculation therefrom of the lightship condition, shall be placed on board for the use of the master.
- (3) Where elements of a ship's stability have been found to have changed following any inclining or lightship survey or test carried out in accordance with the requirements of paragraph (2), the master shall be supplied with amended approved stability information.
- (4) Where any alterations are made to a ship so as materially to affect the stability information supplied to the master amended stability information shall be provided and the ship shall be re-inclined
- (5) The stability information provided pursuant to paragraphs (2), (3) and (4) shall be furnished in the form of a book (the stability information book) which shall be kept on board the ship at all times in the custody of the master. The information shall include particulars appropriate to the ship and shall be in a form acceptable to the certifying authority.
- (6) Every inclining or lightship survey or tests made for this purpose or for the purpose of this section of the Code shall be carried out in the presence of an MCA surveyor.

## **11 Freeboard and Freeboard Marking**

Rationale: The ship shall have and maintain sufficient freeboard in relation to its size and intended operation.

### **11.1 Draught marks**

Every ship shall have a datum marked clearly at the bow and stern with a range of draught marks of interest. The accuracy of the draught marks shall be witnessed and confirmed by the MCA, or Classification Society, surveyor.

### **11.2 Freeboard Marking**

- 11.2.1 Every ship shall be marked on each side of the ship at amidships with its assigned loaded freeboard. The mean loaded freeboard measured at the amidships point is the assigned loaded freeboard of the ship. The marks shall consist of horizontal lines 25 mm in breadth and 300 mm in length. The marks shall be painted in white or yellow if the background is dark or in black if the background is light and they shall be permanently affixed to the sides of the ship. The location and accuracy of the freeboard mark shall be witnessed and confirmed by the MCA, or Classification Society, surveyor. Normally the freeboard mark shall be centred at midships LBP but if this cannot be done for any reason it shall be placed as near to that point as possible and the distance of any deviation noted.

### **11.3 Assigning of freeboard**

- 11.3.1 For subdivided ships operating on category C and D waters the assigned freeboard shall be the greatest of:
- (a) freeboard of the deepest approved loading condition recorded in the stability information booklet; or
  - (b) 380 mm for ships of 12 metres length or less to 760 mm for ships of 24 metres length or more and the value obtained by interpolation for lengths between 12 and 24 metres; and
  - (c) in no circumstances shall the assigned freeboard draft be greater than the approved scantling draft .
- 11.3.2 For open ships, as depicted in Annex 7, operating on category C and D waters the assigned freeboard shall be the greatest of:

- (a) freeboard of the deepest approved loading condition recorded in the stability information booklet; or
- (b) 380 mm for ships of 6 metres length or less to 760 mm for ships of 18 metres length or more and the value obtained by interpolation for lengths between 6 and 18 metres; and:
- (c) in no circumstances shall the assigned freeboard draft be greater than the approved scantling draft.

11.3.3 For ships operating on category B waters the assigned freeboard shall be the greatest of:

- (a) freeboard of the deepest approved loading condition recorded in the stability information booklet; or
- (b) 380 mm for ships of 12 metres length or less to 570 mm for ships of 18 metres length or more and the value obtained by interpolation for lengths between 12 and 18 metres, and:
- (c) in no circumstances shall the assigned freeboard draft be greater than the approved scantling draft.

11.3.4 Ships operating on category A waters shall be allowed to take the minimum freeboard requirement of 380 mm regardless of the length of the ship provided the minimum residual freeboard in the heeled condition is at least 252 mm. In no circumstances shall the assigned freeboard draft be greater than the approved scantling draft.

11.3.5 Ships complying with the heel test requirements shall be marked with the assigned loaded freeboard corresponding to the full load condition at which the heel test was conducted. Where the heel test requirements were demonstrated by calculation, the marked freeboard shall be the freeboard corresponding to the full load condition used in the calculation.

#### **11.4. Freeboard measurements**

11.4.1 Loaded freeboard measurements shall be taken at the heeling test with all weights onboard corresponding to the total number of passengers at 75 kilogrammes each. Freeboard measurements shall be taken at positions forward, aft and amidships; with the location of the measurement points being recorded for future reference. Freeboard measurements shall generally be taken to the deck edge at side; any exception to this shall be noted to avoid any misinterpretation. The minimum freeboard and its location shall also be recorded. The mean loaded freeboard shall not be



less than the minimum freeboard permitted for the ship. These minimum freeboards may be subject to concessions given in 9.3 and 9.4.

- 11.4.2 The mean loaded freeboard measured at the amidships point shall be the assigned loaded freeboard of the ship and shall be the freeboard to be marked as required by Section 11.3.2. The assigned freeboard shall be the distance between the top edge of the mark and the deck edge at side (or noted alternative reference point). The surveyor shall attend the ship to verify that the marks are in the correct position.
- 11.4.3 Open ships may take the minimum freeboard to the lowest point of downflooding rather than to the deck edge, providing that the upstands or superstructure raising the point of downflooding above the level of the deck are of a similar standard of watertight structural efficiency to the ship's topsides.
- 11.4.4 In the case of ships heeling less than 7° but not meeting the minimum freeboard requirement, a reduced minimum freeboard may be accepted provided that the actual freeboard in the heel test condition is not less than the residual freeboard would have been, had the prescribed minimum freeboard criteria been complied with and the ship had heeled to the full 7°.
- 11.4.5 At the heeling test, freeboard measurements shall also be taken in the 'light' condition with no passenger weight on board. This may be done before or after the heeling test is conducted. The tank states shall be as per the heeling test condition (95% full or compensated using weights). Freeboard measurements shall be taken forward, aft and amidships; with the location of the measurement points being recorded for future reference. Details of any bar stock, changes in normal furniture and equipment, and number of personnel onboard shall also be noted.

## **11.5        Sounding Arrangements**

- 11.5.1 All tanks shall be provided with an efficient arrangement to ascertain fluid levels in them and all watertight compartments, not being part of the machinery space, shall be provided with efficient sounding arrangements to ascertain the water level therein, which shall be protected where necessary against damage.

Rationale: Liferafts - Evacuation in an emergency should be direct to shore, liferaft or attending ship as far as practical, therefore passengers should not be expected to enter the water. In category A waters, ships should use the most appropriate life saving appliance or equipment to achieve this goal. In other categories of water, in the event of flooding when damage exceeds the survivability standard, or uncontained fire, it is of paramount importance to evacuate the ship as quickly as possible. Open Reversible Inflatable Liferafts (ORIL) provide a safe evacuation platform and total evacuation time will be less than scenarios when other ships attend to evacuate passengers if they are not in close proximity.

Rationale: Buoyant Apparatus – The provision of buoyant apparatus or lifebuoys is to provide some temporary support for those persons who may enter the water because they were unable to successfully take advantage of the dry-shod evacuation facilities . In this event, buoyant apparatus would give those passengers in the water something to hold on to until they could transfer to a liferaft or until assistance arrives.

Rationale: Life-saving appliances shall be provided to protect all persons onboard should they be required to abandon the ship. Life-saving appliances shall also be provided that will enable the ship's crew to contact emergency services in an emergency situation.

Rationale: The crew onboard the ship must be able to recover a person incapable of self recovery from the water.

Life-saving appliances and equipment shall be provided in accordance with tables 1 and 2 below.

**Table 1 - Life Saving Appliances and Equipment**

Requirement	Most Onerous Water Category of Operation			
	A	B	C	D
<b>LIFERAFTS or ORIL *</b>	N/A, See 12.1.1	100% See 12.1.2 and 12.2.1	100% See 12.2.1	100% See 12.1.4(2) and 12.2.1
<b>ADDITIONAL BUOYANT APPARATUS OR LIFEBOOYS *</b>	N/A	20% See 12.2.6	20% See 12.2.6	20% See 12.2.6
<b>LIFEBOOYS (Total) **- Comprising of :-</b> see 12.2.3	10% with a minimum of 4, see 12.1.1 (4)	4, see 12.1.2 (2)	4, see 12.1.3	4, see 12.1.4
<b>LIFEJACKETS/BUOYANCY AIDS</b> (see 12.2.4)	N/A	100%	100%	100%
<b>PUBLIC ADDRESS SYSTEM</b> (see 12.4.1)	YES	YES	YES	YES
<b>PRIMARY MEANS OF COMMUNICATION</b> (See 12.4.2(1))	VHF DSC (see 12.4.2(1))	VHF DSC (see 12.4.2(1))	Fixed VHF DSC	Fixed VHF DSC

<b>PORTABLE COMMUNICATION DEVICE</b> (See 12.4.2 (2))	N/A	VHF or mobile phone*** - 1 per liferaft	VHF radio - 1 per liferaft	VHF radio - 1 per liferaft
<b>PYROTECHNICS</b>	N/A	N/A	N/A	YES
- RED PARACHUTE ROCKET	N/A	N/A	N/A	2
- RED HANDHELD	N/A	N/A	N/A	2
- BUOYANT ORANGE SMOKE	N/A	N/A	N/A	2
<b>RESCUE BOAT</b>	N/A	N/A	YES (for over 24m.) See 12.2.2	YES (for over 24m.) See 12.2.2
<b>SET OF LINE THROWING APPLIANCES (2 lines plus 2 Projectiles)</b>	N/A	N/A	N/A	1 (for over 24m)
<b>BOATHOOK and SEARCHLIGHT</b>	YES	YES	YES	YES
<b>MEANS OF RECOVERY OF PERSONS FROM THE WATER</b> (see 12.2.5)	YES	YES	YES	YES

NOTE: Where a percentage is specified this denotes the percentage of total number of persons the ship is certificated to carry for whom provision shall be made

\* Liferafts, ORIL and Buoyant Apparatus shall be float free.

\*\* These can be the same lifebuoys detailed in the Additional Buoyant Apparatus or Lifebuoys section of the table.

\*\*\* Where there is mobile phone coverage available. This shall be documented in the SAR Plan.

**Table 2 - Documentation Required**

Requirement	Most Onerous Water Category of Operation			
	A	B	C	D
<b>TRAINING MANUAL</b> (see 16.4.2 (2))	YES	YES	YES	YES
<b>POSTERS AND SIGNS SHOWING SURVIVAL CRAFT AND EQUIPMENT OPERATING INSTRUCTIONS</b> (see 12.2.1 (1))	YES (if applicable)	YES	YES	YES
<b>INSTRUCTIONS FOR ONBOARD MAINTENANCE</b> (see 16.4.3)	YES	YES	YES	YES

## 12.1 Life-Saving Appliances and Equipment Carriage Requirements

### 12.1.1 Ships which may operate in Category A waters only

- (1) Provision must be made to enable all persons onboard to transfer direct to shore safely in an emergency scenario wherever possible. Equipment capable of efficiently transferring all persons ashore must be provided; this may include ladders, gangways, inflatable slides, tenders or other craft as appropriate.
- (2) The method and equipment adopted will vary, dependant upon the shoreline within the area of operation, the ship's freeboard and

probable emergency scenarios. Where the shoreline is generally of a similar height to the embarkation point(s), personnel transfer ashore may be achieved via a suitably constructed gangway. If the height of the shoreline is generally significantly higher than the embarkation point(s), means of transferring persons may be via the use of ladders as appropriate. In this case, the risk assessment referred to in section 3.7 shall include the anticipated physical capabilities of the passengers. In cases where the shore line is predominantly lower than the embarkation points(s) then inflatable slides may be used.

- (3) When operating at night there must be sufficient portable lighting provided to enable those onboard to safely make their way to a safe place ashore, with consideration made of the terrain they may be required to cross. Any operational restrictions shall be recorded on the Passenger Ship Safety Certificate.
- (4) All means of transferring persons ashore in emergency scenarios shall be to the satisfaction of the surveyor.
- (5) Sufficient lifebuoys shall be provided for a least 10% of persons on board at least two lifebuoys shall be provided with buoyant lifelines and at least two with lights.

#### 12.1.2 Ships which may operate in Category B waters

- (1) Ships operating in Category B waters must normally provide liferafts of ORIL as required in Table 1 above.
- (2) However, in operating areas where the ship is never further than 80 metres from an accessible bank where persons could be evacuated should the need arise, liferafts or ORIL are not required to be provided. This should be agreed with the surveyor by the provision of objective evidence, and the restriction shall be recorded on the Passenger Ship Safety Certificate. Such evidence may be part of the risk assessment undertaken by the operator, as required by section 3.7.
- (3) Where the relaxation outlined in paragraph (2) is agreed, the ship shall continue to carry additional buoyant apparatus in accordance with

Table 1 above.

(4) At least two of the lifebuoys shall be provided with lifelines and two with lights.

(5) The requirements of 12.1.1(3) and (4) shall be complied with.

#### 12.1.3 Ships which may operate in Category C Waters

At least two of the lifebuoys shall be provided with lifelines and two with lights. In the case of a ship over 24 metres in length, not less than two of the lifebuoys provided with lights shall also be provided with 3 minute smoke floats and be capable of quick release from the wheelhouse. At least 50% of any additional lifebuoys carried shall be fitted with lights.

#### 12.1.4 Ships which may operate in Category D Waters

(1) At least two of the lifebuoys shall be provided with lifelines and two with lights. In addition to the pyrotechnic requirements of Table 1, ship over 24 metres in length, not less than two of the lifebuoys provided with lights shall also be provided with self-activating smoke signals and be capable of quick release from the navigating bridge. At least 50% of any additional lifebuoys carried shall be fitted with lights.

(2) Approved lifeboats or Marine Evacuation Systems (MES) shall be accepted as an alternative to the liferaft requirements stated in Table 1.

### 12.2 General Equipment Requirements

#### 12.2.1 Liferafts (including ORIL)

##### (1) General standards for liferafts

Except as allowed for in sections 13.1.3 and 13.1.4, prescribed liferafts shall be SOLAS standard and MED approved canopied liferafts. SOLAS canopied liferafts may be permitted an uplift in capacity of 20% in accordance with Instructions to Surveyors for Life Saving Appliances, MSIS14, Section 7.7.20. Other relevant liferaft standards may be considered on application to the MCA.

**(2) General standards for Open Reversible Inflatable Liferafts (ORIL)**

ORIL provided in compliance with this section shall be either SOLAS MED rafts complying with the requirements of the Annex 11 of the IMO High Speed Craft Code, 2000, or Non-SOLAS Reversible rafts approved for and complying with UK requirements in MSN1676 Schedule 4 Part 4, which permits a higher number of persons within a given size of raft than the SOLAS requirement. Other relevant ORIL standards may be considered on application to the MCA.

**(3) Operating instructions for launching of liferafts**

Posters and signs shall be provided in the vicinity of liferafts illustrating the purpose of the controls and the procedures for launching the liferaft.

**(4) Distribution of liferafts**

Where liferafts are carried they shall, as far as practicable, be equally distributed on each side of the ship close to the embarkation stations. Alternative arrangements can be accepted provided it is practically demonstrated to the surveyor that all liferafts can be readily transferred to the embarkation stations.

**(5) Assembly and Embarkation arrangements for liferafts**

- (a) Suitable embarkation arrangements shall be provided to ensure safe and efficient evacuation of passengers dry shod.
- (b) Liferaft embarkation arrangements shall comply with the following:
  - (i) Where the distance between the embarkation deck and the top of the liferaft buoyancy tube exceeds 1 metre with the ship in its lightest condition, either an evacuation slide or SOLAS type embarkation ladder are to be provided.
  - (ii) Where the distance between the embarkation deck and the top of the liferaft buoyancy tube exceeds 4.5 metres with the

ship in its lightest condition, davit launched liferafts and at least one launching appliance shall be provided on each side of the ship.

- (iii) Liferaft stowage positions shall not be located in way of the machinery spaces or other spaces with a high fire risk unless the boundaries between the high risk areas and the liferaft stowage position is insulated to the A-30 standard of fire protection.
- (iv) Embarkation and assembly stations shall not be located in way of the machinery spaces or other spaces with a high fire risk unless the boundaries between the high risk areas and the embarkation and assembly station is insulated to the A-30 standard of fire protection.
- (c) Assembly points shall be readily identifiable by signage. All routes to the assembly points shall be clearly marked.

**(6) Launching stations for liferafts**

- (a) A launching station for liferafts (including open reversible liferafts) shall be in such a position as to ensure safe launching. Ships over 24 metres shall have particular regard to liferaft clearance from the propeller and steeply overhanging portions of the hull so that, as far as practicable, liferafts can be launched down the straight side of the ship. Care shall also be given to avoid the ship's side in way of a machinery space or other space with a high fire risk unless the side of the ship is insulated to the A-30 fire protection standard. Life saving appliances shall also be stowed abaft the collision bulkhead.
- (b) Where davit launch liferafts are carried they shall be capable of being boarded from a position immediately adjacent to the stowed position or from a position the liferaft is transferred to prior to launching.
- (c) Handling of liferafts at any one launching station shall not interfere with the handling of liferafts at another launching station.

**(7) Stowage of liferafts**

- (a) Liferafts and buoyant apparatus shall be so stowed that they can be released into the water safely even under unfavourable conditions of trim and of up to 15 degrees of list either way.
- (b) Liferafts shall be stowed so that they can all be released from one control position on the ship or alternatively so that all the liferafts on each side of the ship can be released from one control position on that side.
- (c) Such control position or positions shall be at or adjacent to the location from which the ship is steered.
- (d) The stowage and release arrangements for liferafts/ORIL are to be such that the liferaft will automatically inflate on reaching the water in a controlled evacuation procedure. A special painter arrangement is to be incorporated into the gas inflation system for this purpose.
- (e) Liferafts shall be stowed, as far as practicable, in a secure and sheltered position.
- (f) Every liferaft shall be stowed:
  - (i) with its painter permanently attached to the ship, with a suitable weak link able to break under the force of the buoyancy of the liferaft. The painter should be arranged to allow the safe operation of the liferaft and facilitate quick launching.
  - (ii) so that the liferaft can be manually released from its securing arrangements.
- (g) Any float-free arrangement shall be capable of being activated in the depths of water in which the ship operates. The manufacturers' recommendations should be followed.
- (h) As far as practicable, liferafts shall not be positioned in the vicinity of any over-board discharge.
- (i) Liferafts shall be stowed so that one person may launch the



liferaft into the water in an emergency.

#### 12.2.2 Rescue Boats

- (1) All ships of greater than 24 metres in length that are certified to operate in Category C or D waters shall be fitted with a rescue boat.
- (2) Rescue boats shall be served by their own launching appliances.
- (3) Sufficient inflatable lifejackets for the crew of the rescue boat shall be provided.
- (4) Posters and signs shall be provided in the vicinity of the rescue boat illustrating the purpose of the controls and the procedures for launching and manoeuvring the rescue boat.
- (5) The requirement for the carriage of a rescue boat may be relaxed for ships of less than 50 metres in length where the surveyor considers that the installation is not possible due to inadequate space. For such a relaxation the ship must be arranged to allow the recovery of a helpless person from the water; recovery of the helpless person can be observed from the navigating bridge; and the ship must have sufficient manoeuvrability to close to and recover the person in the worst operating conditions. Consideration of the rescue of somebody from the water should be made in the risk assessment required under 3.7.1 and 12.2.5.

#### 12.2.3 Lifebuoys

- (1) Lifebuoys shall be so distributed as to be readily available on both sides of the ship and, as far as practicable, positioned near mooring or embarkation points. At least one lifebuoy shall be placed in the vicinity of the stern.
- (2) Lifebuoys shall not be permanently secured in any way and shall be stowed to be capable of being rapidly cast loose.
- (3) Lifebuoys with lights and those with both lights and smoke signals shall, so far as practicable, be equally distributed on both sides of the ship.

#### 12.2.4 Lifejackets / Buoyancy Aids

- (1) Where required by Table 1, suitably sized buoyancy aids or lifejackets shall be carried for all persons onboard, including adequate provision for infants, children and oversized passengers. Depending upon the mix of passenger sizes anticipated to be carried in service this may require carriage of lifejackets and buoyancy aids in excess of the number of persons the ship is certified to carry. The operator should consider this in their risk assessment required by 3.7.1. The numbers provided shall be to the satisfaction of the surveyor.
- (2) Lifejackets or buoyancy aids shall be stored where they are readily accessible where passengers are seated, and their location clearly marked. They shall be stowed with straps in their most relaxed positions for easy donning, and clear guidance on donning, fastening and tightening shall be provided nearby. Lifejackets shall be ready for immediate use at all times, and the stowage shall be suitable to allow rapid donning of lifejackets in an emergency.
- (3) Lifejackets or buoyancy aids shall be stowed throughout the passenger accommodation. For ships constructed on or after 1 January 2018, the distribution of lifejackets or buoyancy aids around the ship shall follow approximately the distribution of passengers.
- (4) Lifejackets on all category C and D ships constructed on or after 1 January 2018 shall be fitted with an automatically activated light of MED, SOLAS or ISO approved type.
- (5) This requirement may be relaxed for Category C ships that operate only between sunrise and sunset (i.e. in daylight hours, and do not carry navigation lights). In this case, the limitation of daylight only (between sunrise and sunset) shall be recorded on the certificate.
- (6) Any lifejacket lights voluntarily carried in excess of the requirement of (4), for example on ships built before 1st January 2018, should be automatically activated and of MED, SOLAS or ISO approved type.

#### 12.2.5 Means of recovery of persons from the water

- (1) Operators must carry out a risk assessment to determine the means

necessary to effect rescue of persons incapable of self recovery from the water.

- (2) Ships shall be so designed to enable the safe recovery of persons from the water. Arrangements will be dependent on the individual ships, but ships with good manoeuvrability, together with adequate onboard equipment (such as a boom with a lifting device or a recovery cradle and boathooks) will provide the best platform from which to recover a person from the water.
- (3) Ships of over 24 metres in length operating in Category C or D waters are normally required to carry a rescue boat, but may be subject to the concessions in 12.2.2.
- (4) The means of recovery of persons from the water must be satisfactorily demonstrated under realistic conditions to the MCA surveyor.

#### 12.2.6 Buoyant Apparatus

12.2.6.1 Buoyant apparatus shall be stowed in a float-free arrangement.

### 12.3 Servicing of LSA

12.3.1 Liferafts shall be serviced in accordance with the manufacturer's instructions and at least twice in every 5 year period for the first 10 years of service life. Thereafter, such liferafts shall be serviced annually, in accordance with the manufacturer's instructions.

12.3.2 Inflatable lifejackets shall be serviced in accordance with the manufacturers instructions and at least every 2 years. Where any inflatable lifejackets are used on a regular basis, they shall be serviced annually.

### 12.4 Communications

#### 12.4.1 General Alarm system

Ships shall be provided with a general emergency alarm system, or a public address system, which can also be used for broadcasting a general emergency alarm. If a public address system is used it shall also be in

accordance with section 13.1.

#### 12.4.2 Primary and Portable Communications

##### (1) **Primary Communications**

All ships shall carry suitable means of contacting emergency services for the area of operation. This shall normally be by VHF DSC unless operating in areas without suitable VHF coverage. In such circumstances, primary communication shall normally be by mobile phone or other communication system that can be shown to provide a reliable connection at all times. In category C and D waters the ship's primary VHF DSC radio shall be fixed. Where fitted, the VHF DSC radio shall have a suitable position input which may be either by a global positioning system or by regular manual input.

##### (2) **Portable Communication**

A portable VHF shall be provided for each liferaft, where carried, subject to adequate coverage as outlined in sub-paragraph (1) above. These are to be portable, waterproof and shall be stowed in a protected and easily accessible position.

#### **12.5 Retro-reflective material**

Life-saving appliances shall be fitted with retro-reflective material. The dimensions and location of the material shall be as specified in Annex 6.

#### **12.6 Tunnel and Lock Transits**

12.6.1 Owners/Operators shall carry out a risk assessment to determine adequate LSA provision.

12.6.2 Passage through a canal tunnel of over 300 metres in length without a towpath requires special consideration by the surveyor. This will be dependent upon the type of propulsion, location, availability of emergency services and the tunnel safety procedures supplied by the Navigation Authority and the operator.

12.6.3 Where a towpath is provided, irrespective of tunnel length, a gangway and

powerful hand lamps shall be carried.

12.6.4 Ships transiting locks shall ensure a means of raising alarm in the case of an emergency and must carry equipment such as:

- (1) Additional rope for lashing
- (2) Loop harness and safety rope
- (3) Ladders and torches, as appropriate.

## **13                    Emergency Information for Passengers and Escapes**

Rationale: A member of the crew must be able to broadcast a safety or emergency message that can be heard by all persons onboard the ship.

### **13.1                Public Address Systems**

- 13.1.1 Ships are to be provided with a public address system, operable from at least one point that can be heard by all persons onboard. All ships carrying more than 100 passengers or more than 30 metres in length shall have a public address system operable from at least two well separated points.
- 13.1.2 In ships carrying not more than 60 passengers in which the passengers have access to only one passenger compartment or space, a portable loud hailer may be carried in lieu of the a public address system required by 13.1.1.
- 13.1.3 Arrangements and procedures must be in place to silence entertainment systems (such as amplifiers, musical equipment etc.) and entertainers when the public address system is to be used. The ability to turn off electronic entertainment systems must be available at the point of operation of the public address system. Manual shut off shall be available on ships with loud hailers.

#### **(1)                System Requirements**

- (a) The system shall be used to inform the passengers of the action they shall take in the event of an emergency which could lead to the ship being abandoned. This information, detailed in 13.1.3 shall be given either prior to or immediately on leaving the berth. An example of such an announcement is given at 13.1.4. In the case of ships which operate a waterbus or regular ferry service of short duration where compliance would result in very frequent broadcasting of the safety message, other arrangements will be considered by the surveyor. Arrangements such as drawing attention to the relevant safety notices may suffice.
- (b) The speakers in the public address system must be so located that broadcasts will be audible in all public spaces, including open decks, to which passengers have access.

- (c) A public address system shall be powered from the main source of electrical power and from an alternative source of electrical power situated in a location remote from the main source. Battery back-up or spare batteries shall be carried for loudhailers.

(2) **Passenger Emergency Instructions Notices**

- (a) Passenger Emergency Instructions notices shall be displayed in each passenger compartment. The number to be displayed will depend on the layout of the compartments and the service the ship is engaged in. Notices shall also be provided in waiting rooms and terminals, where practicable. The information provided in a notice shall include:
  - The method to be used to inform passengers that an emergency has occurred;
  - The action they will be required to take;
  - How to use the life-saving equipment;
  - How to don a lifejacket; and
  - Where lifejackets are carried, if appropriate.

(3) **Passenger Emergency Instructions Announcement**

- (a) The announcement required to be made at the commencement of each voyage shall contain as a minimum:
  - The method to be used to inform passengers that an emergency has occurred;
  - The type of life-saving appliances on board;
  - Action to take in event of an emergency;
  - How to use the life-saving appliances.
- (b) Announcements shall be made in a clear and simple manner, bearing in mind that in some services a significant number of persons may not understand the main language used on board the ship. Announcements shall be brief in order to convey sufficient information to assist all concerned in the event of an emergency.
- (c) Announcements shall be prefaced by a special signal followed by a request for everyone's attention. An example of such an announcement is given below.

(4) **Example of Emergency Instruction Broadcast**

- (a) Special signal sounded.
- (b) Ladies and gentlemen, please listen very carefully to the following safety announcement.
- (c) In the unlikely event of an emergency you will be informed by means of an announcement\*/a signal consisting of seven or more short blasts followed by one prolonged blast on the ship's whistle and/or the alarm bells\*/by a crew member\*. Please follow the instructions given in the event of an emergency.
- (d) The ship is equipped with lifejackets\* with donning instructions. Crew members will assist where necessary.
- (e) The ship is equipped with liferafts\*, buoyant apparatus\* and lifebuoys\* which can be manually launched or will float free in the event of the ship sinking.
- (f) In the unlikely event of an emergency requiring evacuation you will be instructed by the Master to proceed to the nearest assembly area\*\* or embarkation point\*\* to board a liferaft or embark safely to shore or an attending ship. All exits are clearly marked. Please do not attempt to abandon the ship unless specifically instructed to do so by the crew.
- (g) Lifebuoys and buoyant apparatus are fitted with grablines. Each lifebuoy will support two persons.
- (h) In the unlikely event of an emergency, it is of great importance that all passengers remain calm and listen for instructions.

\* As appropriate

\*\* Include location

## **13.2 Means of escape**

Rationale: All persons onboard should be able to escape from any space which may be occupied under normal operational circumstances readily in an emergency.

- 13.2.1 Every ship shall provide means of escape from all crew and passenger spaces. These escapes are to be in the form of doorways, corridors or stairways, unless alternative arrangements are defined below. They shall lead to embarkation points close to the stowage position of life saving appliances or assembly areas. There shall be at least two widely separated escapes from each space although in spaces normally



occupied by limited numbers of crew only this may be reduced to one.

- (1) In enclosed spaces where more than 5 passengers are likely to be present, there shall be at least two escapes on each side of the ship on each deck. The main escapes each side shall be by doorways or stairways; in addition there shall be at least one escape on each side by emergency window. Other smaller enclosed spaces such as toilets or walk-in storage areas must have direct access to another space providing an escape route.
- (2) The means of escape shall be so designed and constructed as to be capable of being easily used by the persons for whom they are intended. In crew spaces the second escape route may be a ladder way or emergency window.
- (3) Where escapes are in the form of doors or windows they shall be capable of being opened from either side.
- (4) All escapes shall be clearly marked.
- (5) Main and emergency lighting shall be provided at each escape point.

13.2.2 The minimum clear width of doorways, corridors and stairways depends on two aspects: firstly a minimum width to allow movement of people in both directions as needed, and secondly an overall width to allow the total number of persons to escape the space in a reasonably short length of time. The minimum width of any individual door, corridor or stairway shall be 750 mm, but see section 5-1 for guidance on access for persons of reduced mobility.

13.2.3 Notwithstanding the above the minimum aggregate clear width of escape doors, corridors and stairway shall be increased by 10mm for every passenger in excess of 75 that the escape or escapes are designed to be used by. A space with between 75 and 150 passengers with two escape routes (as required) will meet the aggregate requirement by default provided that the number intended to escape through each route is a maximum of 75. If, for example one escape were intended to be the route for 100 passengers and one for 50 the clear widths would need to be 1000mm and 750mm respectively. A space with 200 passengers would need an aggregate clear width of 2000mm and the intended distribution would determine the number and width of each escape (eg two 1000mm doors, but three 750mm doors as in no case are they to be less than

750mm).

- 13.2.4 Stairways shall, where practicable, be arranged in the fore and aft direction and at an inclination of not less than 45 degrees to the vertical.
- 13.2.5 Where any of the means of escape are windows, they shall be easy to open and arranged to be readily accessible. The minimum dimension of windows used for escape shall be 600 mm by 600 mm.
- 13.2.6 All doors provided for passenger use and leading from passenger compartments to open decks shall be clearly indicated with one or more signs marked "EXIT". Any doors, windows, or other openings provided for emergency escape purposes but not normally used by passengers shall be clearly indicated with one or more signs marked "EMERGENCY ESCAPE DOOR" or "EMERGENCY ESCAPE WINDOW" as appropriate. Signs shall be:
- (1) Inherently luminous or electrically powered by an internal power source which is maintained and charged in normal service.
  - (2) Located over the door, window or escape where possible. Where a door is not readily visible from within the space it serves, a further sign shall be provided to indicate the direction in which the door lies. Signs shall not be on doors except in cases where a door is never in the open position when the ship is in service. Signs shall be composed of white or light coloured letters on a green background, examples of signage are given in Annex 4.
- 13.2.7 The means of escape from any public room which may be used for entertainment shall be adequate. The seating shall be arranged to ensure free access to the exits. All doors shall be constructed to open in the direction of escape.
- 13.2.8 All decked machinery spaces, shaft tunnels, boiler rooms or similar shall be provided with two means of escape as widely separated as practicable. The means of escape shall consist of steel ladders leading directly or indirectly to the stowage position of the LSA or assembly areas. In any such ship the surveyor may permit one of the means of escape required by this paragraph to be dispensed with having regard to the size, nature and location of the space and whether persons are normally employed in that space. Where

only one means of escape is permitted it should lead as directly as possible to an open deck or assembly point.

## **14 Search and Rescue (SAR) Requirements**

### **14.1 SAR Plan**

Rationale: The aim of the SAR co-operation plan is to ensure that, in the event of an emergency, ships' staff, the company response team ashore and SAR services are able to work efficiently together to respond to an emergency.

14.1.1 All ships must carry an approved up to date plan for co-operation with relevant SAR services for the ship's area of operation. Brief details of the passenger ship, the company and the SAR services must be exchanged and maintained ready for use and shall include direct contact details.

14.1.2 The SAR plan shall be prepared in the format required by MSN 1878.

14.1.3 Copies of the approved SAR co-operation plan shall be held onboard, in the company office and at the relevant SAR service. This will normally be the UK Coastguard's, National Maritime Operations Centre (NMOC). SAR plans should be submitted there electronically, to the e-mail address: [sarcp@hmcg.gov.uk](mailto:sarcp@hmcg.gov.uk). For inland areas however, the SAR service may be a relevant Police Authority, and in these cases, advice should be sought from the NMOC, at the following address:

National Maritime Operations Centre (NMOC)  
HM Coastguard  
Unit 12  
Kites Croft Business Park  
Fareham  
Hampshire  
PO14 4LW.

Tel: 02392 556000

### **14.2 SAR Exercises**

Rationale: Exercising the SAR Plan regularly tests the plan's effectiveness.

14.2.1 Exercises shall be undertaken to test the plan's effectiveness periodically. These shall be combined with any other exercise programs, to test SAR

services and co-operation arrangements without imposing an additional burden on ships' staff.

- 14.2.2 For companies who operate six or more ships, an overall program of exercises shall be developed by the company and the relevant SAR services, to ensure all staff participate. Where possible, it is recommended that joint exercises with the relevant SAR services shall be undertaken annually. In most cases this can take the form of a simple tabletop exercise.
- 14.2.3 The fundamental principles of the SAR plan will be discussed at the annual survey to demonstrate procedures are clearly understood, are readily accessible and contain up-to-date information.
- 14.2.4 Records of such exercises and names of participants shall be recorded in the Safety Management System.

### **14.3 Accident Reporting**

- 14.3.1 It is a requirement that certain notifiable accidents involving or occurring onboard a ship must be reported in accordance with The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012. Guidance is provided in MGN 564: Marine Casualty and Marine Incident Reporting.
- 14.3.2 When a notifiable accident occurs, the following persons associated with the ship shall send a report as soon as possible to the Chief Inspector of the Marine Accident Investigation Branch (MAIB);
  - (1) the master or, if they have not survived, the senior surviving officer, and
  - (2) the ship's owner, unless they have ascertained to their satisfaction that the master or senior surviving officer has reported the accident in accordance with paragraph (a).
- 14.3.3 Any incident or defect which affects the safety of the ship is to be reported to the MCA at the earliest opportunity. This includes any loss, failure or defects occurring to the ship's structure and machinery or to the safety equipment specified in the Supplementary Record of Equipment And Information For A Passenger Ship Operating Solely In UK Categorised

Waters.

## 15 Fire Safety

Rationale: There must be sufficient fire protection of high risk fire areas to prevent the rapid spread of heat, flame and smoke into passenger spaces in order to extinguish a fire or, if firefighting fails, to allow sufficient time to evacuate the ship. Machinery spaces shall be able to be rapidly closed down to contain a fire, before extinguishant is applied. In lower risk areas, such as voids, public toilets and similar spaces, fire should not be able to rapidly take hold. Crew are not expected to carry out sustained fire fighting onboard ships to which this Code applies. The focus is on timely detection and remote control fire fighting systems for high risk areas and machinery spaces.

### 15.1 Fire fighting arrangements

#### 15.1.1 System Capability

- (1) The ship must be provided with at least one power operated fire pump located outside the machinery space which is capable of delivering at least one jet of water to any part of the ship accessible to passengers and crew.
- (2) The requirements of (1) may be relaxed for ships operating on category A waters only or ships of less than 15 metres in length operating on other categorised waters, provided an additional 21A/113B extinguisher is carried in lieu of the power operated fire pump. This is in addition to the portable extinguishers required by section 15.2.

#### 15.1.2 Fire Pumps

- (1) The power driven fire pump shall have a volume flow rate not less than the quantity obtained from the following formula:

Quantity of water in cubic metres per hour =  $2.5d^2$  where:

$$d = 1 + 0.066\sqrt{L(B + D)}$$

$d$  is taken to the nearest 0.25

where:

L = the length of ship measured in metres

B = the greatest moulded breadth measured in metres

D = the moulded depth measured to the bulkhead deck at amidships (or the uppermost part of the gunwale on an open ship) measured in metres

(2) Every centrifugal pump which is connected to the fire main shall be fitted with a non-return discharge valve.

#### 15.1.3 Fire Main and Hydrants

- (1) The fire main and hydrants shall be so positioned to meet the requirements of 15.1.1.
- (2) The fire main shall have no connections other than those necessary for fire-fighting and washing down.
- (3) The fire hydrants shall be so placed that the fire hoses may be easily coupled to them.
- (4) At least one hose must be provided for every hydrant fitted.
- (5) Hydrant valves of the screw lift type shall be fitted in such position that any of the fire hoses may be isolated and removed while the fire pumps are at work.
- (6) The arrangements of pipes and hydrants shall be such as to avoid the possibility of freezing.
- (7) materials readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected.

#### 15.1.4 Fire hoses and nozzles

- (1) Fire hoses shall be of suitable length and diameter to satisfy the requirements of 15.1.1 (1) and 15.1.2.
- (2) Fire hoses and associated tools and fittings shall be kept in readily accessible and known locations, close to the hydrants or connections on which they will be used.
- (3) Each hose shall be provided with a jet/spray nozzle incorporating a shut-off facility.
- (4) Each hose shall be made of non-perishable material.

#### 15.1.5 Drainage of fire extinguishing water from enclosed spaces

- (1) Passenger and crew spaces shall be fitted with drainage arrangements such that fire fighting water is cleared from the space



no less quickly than the rate at which it may be input by the fire fighting system in order to avoid the accumulation of water and associated free surfaces.

- (2) Such drainage mechanisms shall be so arranged as to ensure effective drainage, taking account of possible heel or trim of the ship which might cause an accumulation of water in one part of a compartment. The drainage system shall allow free-flow of water, any valves or closures must be so designed as to reliably open automatically when the fire extinguishing system is in operation.
- (3) Regardless of the route of discharge of water from the ship, which may involve free-flow overboard or drainage to the bilge and pumping from there, it must be able to be discharged at no less than the rate at which it is capable of accumulating. In the design of systems the dimensions of orifices and piping, their shapes and friction factors shall be taken into account where necessary.
- (4) Freeing ports, drains and pump suctions shall be kept free of obstructions and be suitably protected to avoid their blockage during operation. Regular inspection, appropriate to the operation of the ship, shall be carried out to ensure that they are not blocked.

## **15.2        Portable Fire Extinguishers**

### **15.2.1    Every ship shall be provided with:**

- (1) At least one portable fire extinguisher in each of the crew and passenger spaces above the bulkhead deck.
- (2) At least two portable fire extinguishers in each of the crew and passenger spaces below the bulkhead deck.
- (3) The portable extinguishers required by (1) and (2) shall be so arranged such that a portable extinguisher is available for use within a distance of 10 metres from any location and as close to the entrances to spaces as practicable. A minimum of at least three portable fire extinguishers shall be provided.

- 15.2.2 Extinguishers provided in crew and passenger spaces shall be either foam, water, dry powder or a combination thereof, depending on the type of fire risks in specific areas.
- 15.2.3 In spaces where significant amounts of electronic or electrical equipment or appliances are present, such as the bridge or machinery spaces, carbon dioxide, dry powder extinguishers or other types of extinguishers designed to extinguish electrical fires shall be provided and where possible, inlet ports on equipment shall be provided to aid the extinguishing of fires. Consideration should be given to the quantity of carbon dioxide to be released in confined unventilated spaces because it can cause suffocation in sufficiently high concentrations.
- 15.2.4 An additional extinguisher of a suitable type shall be fitted in any galley space and a fire blanket shall be provided in every galley or pantry provided with hot plates for cooking. It is most important that only extinguishers classified as suitable for use on class F fires are used on fat or cooking oil fires.
- 15.2.5 Portable fire extinguishers shall be of the capacities shown in the following table.

<b>Portable Fire Extinguisher Type</b>	<b>Fire Rating</b>
Water	21A
Carbon dioxide	55B
Dry powder	34A/113B
Class F Wet Chemical	13A/113B
Foam	21A/183B

- 15.2.6 Portable fire extinguishers shall be suitably sized to enable ease of handling.
- 15.2.7 Additionally an approved portable fire extinguisher (See Annex 5) suitable for fighting liquid fires (Class B) shall be provided within any manned machinery space.

- 15.2.8 All portable fire extinguishers are to be serviced by a competent person in accordance with the servicing intervals in Table 1 of MGN 276 (M+F) – “Maintenance of portable fire extinguishers”.

### **15.3 Fire Fighting Systems for Machinery Spaces, other than Machinery Spaces with a power output of 375kW or more**

- 15.3.1 All machinery spaces shall be provided with a fixed fire extinguishing system, which may be a water, gas or dry aerosol system that is to the satisfaction of the MCA. Any ventilation machinery supplying a machinery space shall be capable of being shut off from a safe location outside the space and ventilation trunks shall be capable of being closed by damper, efficient flaps or other effective means.

Where access to the machinery space is not possible without leaving the ship, the means of cooling and ventilation of the machinery compartment should be specially considered with regard to means of sealing the space gastight in the case of fire during entry into water and waterborne operation.

#### **(1) Ships of 24 metres and under**

Where machinery spaces consist of machinery covered by a boxed housing the fixed fire extinguishing system may comprise an approved portable extinguisher (of a suitable size and type for the space being protected) permanently connected and arranged to discharge into that space. The boxhousing shall totally enclose the machinery space and, as far as practicable, have the capability of closing any openings in the event of a fire before operation of the fire extinguisher. The arrangements shall be to the satisfaction of the surveyor.

All other arrangements shall comply with (2).

#### **(2) Ships Over 24m**

A fixed fire fighting system complying with MED shall be provided.

- 15.3.2 Where a gas system is fitted to meet the requirement of 15.3.1 or 15.4.1, bottles shall be stowed in well ventilated spaces away from heat/ignition sources and direct sunlight. Stowage shall also not be in the vicinity of

accommodation escape routes or the space the system is protecting. Suitable signage shall be prominently displayed outside the space containing the bottles.

#### **15.4 Fire Fighting Systems for Machinery Spaces with a power output of 375 kW or more**

15.4.1 Machinery spaces with a power output of 375kW or more shall be provided with at least one of the following fixed fire-extinguishing systems complying with the MED:

- (1) a fixed pressure water-spraying system;
- (2) a fixed gas fire-extinguishing system;
- (3) a high expansion foam system;
- (4) a dry aerosol system.

15.4.2 In addition to the requirements of paragraph 15.4.1, any machinery space with a power output of 375kW or more containing internal combustion type machinery shall have readily available portable fire extinguishers suitable for extinguishing oil fires, so located that an extinguisher is not more than 10 metres walking distance from any point in the space. Not less than two such extinguishers shall be provided.

#### **15.5 Fire Detection in Machinery Spaces**

15.5.1 All machinery spaces located underdeck or remote from the control position shall be fitted with a fire detection system comprising of smoke/heat detectors which will give an audible and visual alarm at the control position. For ships under 24m the detection system need not be MED approved but must meet the standard of BS EN 54.

#### **15.6 Fire Protection of Machinery and Auxiliary Machinery Spaces**

15.6.1 All machinery spaces shall be enclosed by "A" class divisions insulated to "A-30" standard. Where the adjacent space is a low risk area such as a void space, side shell (except in way of life-saving appliances) or open decks not used for passengers, crew or cargo, additional structural fire protection is not required, but the boundaries shall be to "A-0" standard (steel) or equivalent. Machinery spaces shall be designed and constructed to enable them to be made gas-tight if a fire occurs.

- 15.6.2 Auxiliary machinery spaces shall be enclosed by an “A-0” division (steel) or equivalent.
- 15.6.3 MGN 407 may be used as an equivalent to the fire protection standards above for fibre re-inforced plastics and timber. When the construction material has been determined it may be possible to select an insulation tested on another structure as described in MGN 407, Annex 1.

## **15.7 Fire protection of passenger and crew accommodation**

- 15.7.1 In all enclosed accommodation the bulkheads, linings, ceilings and their associated grounds shall be constructed of non-combustible materials, as defined in the FTP Code, and their exposed surfaces shall have low flame spread compliant with the FTP Code, Annex 1, Part 5.
- 15.7.2 Primary deck coverings within accommodation spaces, service spaces and control stations are to be of a type which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperatures. These shall be approved in accordance with the FTP Code, Annex 1, Parts 2 and 5, or BS ISO 5658- Part 2:2006+A1:2011.
- 15.7.3 Except when a fully addressable fire detection system is fitted, upholstered furniture (fabric in association with any backing or padding material) used throughout the ship and on open decks shall be approved in accordance with the FTP Code, Part 8 or an equivalent standard, such as BS 5852: 2006, which is acceptable to the MCA.
- 15.7.4 Except when a fully addressable fire detection system is fitted, vertically supported textile materials such as curtains and drapes shall be approved in accordance with the FTP Code, Annex 1, Part 7, or an equivalent standard such as BS 5867-2:2008 Fabric Type ‘B’, tested to BS 5438: 1989 Tests 2A and 2B, which is acceptable to the MCA.
- 15.7.5 All ships with passenger sleeping accommodation shall be fitted with a fixed fully addressable fire detection system installed and arranged to detect the presence of fire in such spaces and corridors, stairways and escape routes within accommodation spaces. Bedding components shall be approved in accordance with the FTP Code, Annex 1, Part 9 or an equivalent standard, such as BS 6807: 2006, which is acceptable to the MCA.

- 15.7.6 Upholstered furniture, bedding components and suspended textiles required to comply with the FTP Code or an equivalent standard (such as suitable ISO/BS standards) are to be clearly labelled by the manufacturer stating the standard that they meet and any washing or cleaning instructions needed to maintain their fire resistance. These labels are not to be removed.
- 15.7.7 Passenger sleeping accommodation shall be fitted with an automatic pressurised water sprinkler or water mist fixed fire fighting system.
- 15.7.8 Ships of 500GT and over shall have a fixed fire detection and alarm system in all enclosed spaces except those containing no significant fire risk (toilets, bathrooms, void spaces, etc.). Manually operated call points should be placed effectively to ensure a system is to be installed in accordance with the requirements of SOLAS II-2/7 and the FSS Code, Chapter 9, and shall be audible externally.

## **15.8 Fire Safety for Galleys, Pantries or Isolated Pantries**

### **15.8.1 General**

(1) Pantries or isolated pantries containing no cooking appliances may contain:

(a) toasters, microwave ovens, induction heaters and similar appliances each of them with a maximum power of 5 kW; and

(b) electrically heated cooking plates and hot plates for keeping food warm each of them with a maximum power of 2 kW and a surface temperature not above 150°C.

(c) such pantries may also contain coffee machines, dishwashers and water boilers with no exposed hot surfaces regardless of their power.

A dining room containing such appliances should not be regarded as a galley.

(2) Galleys and pantries containing cooking appliances may contain:

(a) toasters, microwave ovens, induction heaters and similar

appliances each of them with a power of more than 5 kW; and

(b) electrically heated cooking plates and hot plates for keeping food warm each of them with a maximum power of 5 kW.

(c) such galleys may also contain coffee machines, dishwashers and water boilers regardless of their power.

(3) Spaces containing any electrical cooking appliance, heated cooking plate or hot plate for keeping food warm with a power of more than 5kW, deep-fat cooking facilities or liquefied petroleum gas (LPG) installations must be regarded as a galley and the requirements of section 15.8.3 will apply.

(4) All electrical appliances shall be electrically tested at least annually.

(5) Any LPG installations shall also comply with the requirements of Annex 1.

(6) Ships with cooking facilities on an open deck such as pig roast or barbeque facilities should follow the additional guidance in MGN 406.

#### 15.8.2 Deep-fat cooking equipment

(1) Deep fat cooking facilities shall be fitted with:

(a) an automatic or manual extinguishing system which complies with the requirements of the MED,

(b) a primary and back-up thermostat with an alarm to alert the operator in the event of failure of either thermostat,

(c) arrangements for automatically shutting off the electrical power upon activation of the extinguishing system,

(d) an alarm for indicating operation of the extinguishing system in the galley where the equipment is installed, and

(e) controls for manual operation of the extinguishing system which are clearly labelled for ready use by the crew.

### 15.8.3 Fire protection of galleys

- (1) All galleys shall be enclosed to prevent the spread of smoke and flame. This may be achieved by installation of an A-0 class steel boundary with self-closing steel doors, or by an alternative means, such as steel shutters, together with a MED water-mist fire fighting system. Any serving hatches must be fitted with steel shutters.
- (2) Galleys shall not be sited adjacent to the main escape route as required by Section 13.2 of this Code.
- (3) In addition to the fire extinguishers specified, a readily accessible fire blanket is to be provided in the galley.

## 15.9 Availability of Fire-Fighting Appliances

- 15.9.1 All moveable fire appliances shall be stowed where they will be readily accessible from the spaces in which they are intended to be used. Any appliance out of sight shall have inherently luminous signs identifying the location.

## 15.10 Fire Protection of LSA, Assembly and Embarkation Areas

- 15.10.1 The requirements regarding protection of liferaft stowage, assembly and embarkation areas are detailed in sections 12.2.1 (5) (b) (iv) and 12.2.1 (6) (a).



## **16 Safety Management System**

### **16.1 General**

- 16.1.1 This section applies to all ships except those which comply with the International Safety Management (ISM) Code. All ro-ro ships must comply with the ISM Code.
- 16.1.2 The 'operator' in this section is defined as the owner or other organisation or person assuming responsibility for operating the ship.
- 16.1.3 Further guidance on the DSM Code can be found in MSN 1869 and MGN 536 (as amended).

### **16.2 Objectives**

- 16.2.1 All ships to which this section applies must have a Safety Management System in place to ensure a simple and cost effective means of:
  - (1) ensuring safety on board;
  - (2) preventing human injury and loss of life;
  - (3) preventing pollution; and
  - (4) complying with applicable regulations and rules.
- 16.2.2 Safe practices must be developed and implemented which include the following:
  - (1) a health and safety protection policy;
  - (2) procedures to ensure safe operation of ships in compliance with relevant rules;
  - (3) lines of communication between personnel ashore and afloat with regard to additional requirements and local bye-laws;
  - (4) procedures to prevent pollution;
  - (5) procedures for reporting accidents; and
  - (6) procedures for responding to emergency situations.

### **16.3 Health and Safety Protection Policy**

- 16.3.1 The health and safety protection policy is required to include environmental protection issues only in so far as they relate to the safety

of the ship and the health and safety of persons onboard, and to the safety of other ships and the health and safety of persons onboard other ships and other users of the waterway. Operators shall develop and implement management plans for garbage and oily waste in accordance with the requirements detailed in Sections 18.2 and 18.5 respectively.

16.3.2 The operator shall ensure that a Health and Safety Protection policy is implemented, and that responsibilities of all personnel are understood.

16.3.3 The health and safety protection policy shall:

- (1) Address the issues of health, safety and the environment as they affect the company and its staff, both ashore and afloat.

Such a policy might read along the following lines:

“The policy of (name of Company) is to conduct its activities taking full account of the health and safety of its employees and of all persons using or connected with the Company. In implementing this policy, (name of Company) will ensure that the [ship] is, at all times, properly maintained and operated by qualified personnel in full compliance with relevant legislation. In particular the [Company,] will carry out an assessment of the risks to the health and safety of workers and others affected by [the undertaking], and will take the necessary measures to minimise the risks identified.”

- (2) Include a policy on prevention of alcohol and drug abuse. Where alcohol is served on board, the policy shall also stipulate that no alcohol will be served to persons under 18 years of age.
- (3) Ensure all personnel both ashore and afloat have a duty to take care of themselves and other persons who may be affected by their acts or omissions.

## **16.4 Procedures to Ensure Safe Operation of Ships in Compliance with Relevant Rules**

### **16.4.1 Relevant Rules**

In addition to the rules contained within this Code, procedures must be in place to ensure compliance with the rules relating to the safe navigation

and operation of the ship such as:

- (1) Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996
- (2) Merchant Shipping (Categorisation of Waters) Regulations 1992
- (3) Local Port or Navigation Authority Rules
- (4) Local Bye-laws

#### 16.4.2 Personnel and Training

##### (1) General

- (a) The operator shall ensure that all persons employed in the operation of the ship have received appropriate training for the duties they are required to fulfil and that they have an understanding of the relevant regulations and rules. Masters and crew shall hold the appropriate qualifications.
- (b) As a minimum, this means:
  - (i) for the master, the relevant qualifications;
  - (ii) for the crew, the relevant qualification and training appropriate to their designated duties; refer to the crew qualification and training obligations in section 21.2 and 21.3 respectively.
- (c) Proper instruction in their duties shall be received by personnel before the first occasion of working on the ship as a designated crew member, and as necessary thereafter. This instruction shall be recorded.

##### (2) Training Manual

This shall explain the escape philosophy and define the contingency procedures. This shall include as a minimum how the survival craft are launched and inflated, how the passengers are controlled, lifejackets/buoyancy aids are issued, and how the survival craft is to

be boarded. If the passengers evacuate the ship directly overboard the design concept needs to clearly explain how the passengers are brought together to the survival craft.

- (a) A training and instruction manual must be available onboard for all crew members.
- (b) It may take the form of instructions from manufacturers of the equipment, where appropriate, but must explain in detail at least the following:
  - (i) donning of lifejackets;
  - (ii) boarding, launching, and clearing life-saving appliances from the ship.
  - (iii) illumination of life-saving appliance launching areas;
  - (iv) use of all life-saving appliances and equipment.
  - (v) recovery of persons from the water;
  - (vi) general fire safety practice and precautions related to the dangers of smoking, electrical hazards, flammable liquids and similar common shipboard hazards;
  - (vii) general instructions on fire-fighting activities and fire-fighting procedures including procedures for notification of a fire and use of manually operated call points;
  - (viii) meanings of ship's alarms;
  - (ix) operation and use of fire-fighting systems and appliances;
  - (x) operation and use of fire doors;
  - (xi) operation and use of fire and smoke dampers; and
  - (xii) escape systems and appliances.

### (3) Training Record

- (a) The operator shall maintain a record of master and crew training.

#### 16.4.3 Onboard Procedures

- (1) The operator shall draw up simple procedures to ensure that safe working practices are carried out in the operation of the ship. These may be in the form of checklists which can be followed by all personnel.
- (2) For some ships, it might be appropriate to have permanently exhibited checklists, e.g. in the wheelhouse for navigational items. Alternatively, in a smaller ship, the record could take any suitable form such as a diary as distinct from a specially printed logbook. Whatever form the record takes, such entries would need to demonstrate compliance with the requirements below.
- (3) There shall be procedures in place for key shipboard operations with regard to safety. The tasks involved in these procedures shall be assigned to designated personnel.
- (4) It is the responsibility of the operator to identify necessary procedures. These may include, but are not limited to, the following:
  - testing of equipment, including steering gear, prior to commencing a passage;
  - navigation and manoeuvring of the ship;
  - maintenance routines;
  - watertight integrity;
  - stability of the ship;
  - conduct of passengers and crew while on board;
  - bunker operations;
  - embarkation/disembarkation of passengers;
  - safe mooring practices;
  - communications with other ships and local port or navigational authority;
  - keeping a navigational lookout; and
  - lock operations (if applicable).

#### 16.4.4 Maintenance of Ship and Equipment

##### (1) General

- (a) The operator shall ensure the ship is inspected at frequent intervals to ensure that it is properly maintained and operated in accordance with the relevant rules. Deficiencies shall be identified, corrected, and records of inspections kept.
- (b) Maintenance of the ship and equipment is an essential part of the Safety Management System. The equipment shall be regularly checked and tested. Wherever practicable this should be daily.
- (c) There shall be procedures for a more detailed inspection and maintenance programme of the ship and equipment.
- (d) The frequency of the inspections shall be determined by the owner/operator, but every event shall be recorded.
- (e) A checklist could be employed as an aide memoire for the inspection of equipment.

##### (2) Maintenance of Critical Systems

- (a) All critical systems shall be in working order and ready for immediate use before any ship to which this code applies commences a voyage, and at all times during the voyage. Any item of life-saving equipment marked with an expiry date shall be replaced on or before that date.
- (b) The ship's onboard procedures shall ensure all critical systems shall be maintained, inspected, tested and serviced in accordance with the manufacturers' guidance and regulations as appropriate.
- (c) It is the responsibility of the operator to identify the critical systems for safe operation of the ship. These systems may include but are not limited to the following:

- All life saving appliances and associated equipment;
- All fire fighting appliances and associated equipment;
- Public address systems;
- Main propulsion units;
- Auxiliary units;
- Emergency power sources;
- Emergency lighting;
- Steering systems;
- Navigational equipment; and
- Moorings and anchors.

(d) An up to date record of all inspections and maintenance is to be kept.

## **16.5 Lines of Communication between Personnel, Ashore and Afloat**

### **16.5.1 Responsibilities**

- (1) The master's responsibility shall be laid down so that there is no misunderstanding. They have the authority to make decisions regarding the safety of the ship and persons on board. To ensure that there is no ambiguity regarding the authority of the master, there shall be a simple written statement to this effect. Assistance shall be available ashore from the company at all times.
- (2) Responsibility and authority of each employee shall be clear. This may be best illustrated in a simple diagram, showing who reports to whom.

### **16.5.2 Designated Person**

- (1) A company shall in relation to each ship owned by it, or for which it has operational responsibility, designate a person who shall be responsible for monitoring the safe operation of the ship and, so far as it may affect safety, the efficient operation of the ship.
- (2) In particular, the designated person shall:
  - (a) Take such steps as are necessary to ensure compliance with

the Safety Management System.

- (b) Ensure that proper provision is made for the ship to be adequately manned, equipped and maintained, relating to safety applicable to the ship.

(3) The company shall ensure that a designated person -

- (a) is provided with sufficient authority and resources, and
- (b) has appropriate knowledge and sufficient experience of the operation of ships,
- (c) shall have access to the highest level of management of that company.

(4) The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations specifically require the appointment of one or more competent persons to take responsibility for health and safety. The person(s) shall be identified.

## **16.6 Procedures for Reporting Accidents**

16.6.1 All accidents and near accidents shall be recorded and reported to the operator, who shall implement corrective action, with the aim of improving safety. In addition, the master shall inform the Marine Accident Investigation Branch (MAIB) of all reportable accidents in accordance with The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012. Any incident or defect which affects the safety of the ship is to be reported to the MCA at the earliest opportunity.

16.6.2 The company must therefore have a procedure in place to report any reportable accident to the MAIB and to the MCA.

## **16.7 Procedures for Responding to Emergency Situations**

16.7.1 Potential emergency situations shall be identified, and exercises carried out to respond to these emergencies and for the evacuation of the ship. Where appropriate, these exercises shall involve all personnel including the personnel ashore. The exercises shall be recorded. The names of those who participated shall also be recorded.



- 16.7.2 The roles and responsibilities of all personnel in an emergency situation shall be developed.
- 16.7.3 There shall be clearly stated procedures for responding to emergency situations. These may include but not be limited to fire, collision, contact, grounding, violent act, main propulsion or steering failure, electrical supply failure and man overboard. Checklists may be useful in this regard.
- 16.7.4 It is essential that, in the event of an emergency, there is the ability to communicate with the emergency services either directly or via a shore base. The shore base may be the company office, the local Coastguard, Police or Fire Station, or another office as may be agreed between the ship and the shore base.

## **16.8 Safety Plan**

- 16.8.1 A safety plan in the form of a general arrangement plan of the ship is to be provided showing details of the positioning of all the life saving appliances and fire fighting appliances carried onboard the ship. It shall also include details of escape routes.

## **16.9 Review of the Safety Management System**

- 16.9.1 Every company shall undertake a review of the Safety Management System of the ships at least once every three years. Such reviews, any lessons learned and any actions taken shall be documented and the Safety Management System revised as appropriate.

## **17 Access and Mooring**

### **17.1 Means of Access**

#### **17.1.1 General duties concerning access arrangements**

*(1) It is the responsibility of the owner/operator and master to ensure a safe means of access between the ship and any quay, pontoon or similar structure or another ship alongside to which the ship is secured, and in particular;*

*(a) that any equipment is placed in position promptly after the ship has been secured and remains in position while the ship is so secured.*

*(b) that access equipment is;*

*(i) properly rigged, secured, deployed, and is safe to use; and*

*(ii) adjusted from time to time as to maintain safety of access.*

*(c) that access equipment and immediate approaches are adequately illuminated.*

*(d) that any equipment used for means of access and any safety net is of good construction, of sound material, of adequate strength for the purposes for which it is used, free from patent defect and properly maintained.*

*(2) It is the responsibility of the owner/operator and master to provide safe access to and from the shore if the ship is not secured alongside a fixed berth, but access between shore and ship is necessary.*

**17.1.2** *Guidance is provided in The Code of Safe Working Practices for Merchant Seamen. If there is any risk of falling between the quayside and the ship, safety nets should be rigged where appropriate.*

### **17.1.3 Accommodation Ladders**

*On ships of 120 metres or more in registered length (or, in the case of an unregistered ship, of 120 metres or more overall length) the owner/operator should ensure there is an accommodation ladder carried on the ship which is appropriate to the deck layout, size, shape and maximum freeboard of the ship and which complies to the specifications contained in The Code of Safe Working Practices for Merchant Seamen.*

## **17.2 Guardrails and stanchions**

- 17.2.1 In every ship bulwarks or guard rails shall be provided on every exposed deck to which any passenger may have access. Such bulwarks or guard rails, together with stanchions supporting the guard rails shall be so placed, designed and constructed as to prevent any passenger from climbing or accidentally falling overboard. Guardrails shall have a minimum height of 1000 mm above the deck. However, on ships in Category C and D waters, built on or after 1 January 2018, guardrails shall have a minimum height of 1100mm above deck.

## **17.3 Anchor handling arrangements**

- 17.3.1 Every ship shall be provided with anchor handling arrangements, incorporating anchors and chain cables that are sufficient in number, weight and strength, and where necessary windlass(es), having regard to size and intended service of the ship, and the ground it will be used on.
- 17.3.2 Where anchoring is not permitted by the local Navigation Authority, Harbour Authority or other such body, alternative means of securing the ship may be considered appropriate by MCA. Owners/operators shall consult with such bodies and the MCA to agree a suitable alternative means of securing the ship.

## **17.4 Mooring lines, Bollards/cleats and Mooring Equipment**

- 17.4.1 Every ship shall be provided with mooring lines, bollards/cleats and mooring equipment sufficient in number and strength, having regard to the size and intended service of the ship. Further guidance on safe mooring is provided in MGN 308.

## **18                      *Pollution Prevention and Dangerous Cargoes***

### **18.1                      *General***

- 18.1.1 *This chapter deals with elements relating to both the prevention of operational and accidental pollution, and the carriage of dangerous cargoes.*
- 18.1.2 *In general terms it is the responsibility of the owner/operator to ensure the ship is properly equipped and maintained to ensure efficient disposal of all ship generated waste to shore facilities. Such arrangements shall be documented in the Safety Management System.*
- 18.1.3 *If dangerous cargoes are to be carried, compliance with the appropriate provisions of the UK dangerous cargoes regime will be necessary.*

### **18.2                      *Garbage***

- 18.2.1 *Garbage shall be discharged to shore facilities. Suitable arrangements for the retention of garbage on board shall be provided. Arrangements shall be varied as necessary to comply with special requirements which may be applied by local authorities for the area of operation.*
- 18.2.2 *Every ship of 12 metres or more in length operating on Category C or D waters shall display placards informing the crew and passengers of the requirements for the discharge of garbage.*
- 18.2.3 *Every ship of 400GT or above, or certified to carry 15 persons or more, operating on Category C or D waters shall carry a garbage management plan.*

### **18.3                      *Sulphur Content of Fuel***

- 18.3.1 *Ships using marine fuel oil, marine diesel, marine gas oil or gas oil must ensure that the fuel complies with the prevailing rules on the sulphur content of marine fuels.*
- 18.3.2 *For ships operating on categorised waters this limit is 0.1% sulphur m/m.*

## **18.4 Engine Emissions**

- 18.4.1 *Engine emission requirements arise from more than one regime, and it is important to ensure that the correct one/s is/are complied with (as well as the latest version/s). This will depend on the size and power output of the ship's engine, and the area/s where it will operate. Ship owners and operators are strongly advised to check with the MCA, their ship builder, engine supplier, and the Navigation Authority for the area/s in which the ship is to operate.*

## **18.5 Oil/Oily Waste**

- 18.5.1 *Except in an emergency affecting the safety of the ship and its passengers and crew, no oil or oily waste/bilge mixture water shall be discharged overboard. Means shall be provided to retain all such material onboard to be subsequently discharged to a suitable reception facility ashore. A record of all such discharges shall be kept onboard.*
- 18.5.2 *Ships operating on Category C or D waters of 400GT and over are required to hold a United Kingdom Oil Pollution Prevention (UKOPP) certificate.*

## **18.6 Use of Antifouling Paints**

- 18.6.1 *The use of environmentally harmful organotin compounds in antifouling paints (such as Tributyl Tin) is prohibited anywhere in the marine environment. Details of prohibited compounds can be found in the European Union Regulation EC 782/2003. (Note that, in the UK, this is enforced under The Merchant Shipping (Anti-Fouling Systems) Regulations 2009.)*
- 18.6.2 *Ships of 400GT and over must be surveyed to verify compliance with the requirements and shall be provided with an International Anti Fouling System Certificate that has been endorsed by the Surveyor. Ships of over 24 metres in length but under 400GT shall hold a declaration of compliance endorsed by the ship owner.*

## **18.7 Carriage of dangerous goods**

- 18.7.1 *Any ship carrying dangerous goods should be in compliance with The*

*Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997 and should have a Document of Compliance for the Carriage of Dangerous Goods issued to it by the MCA. These requirements apply to all carriage of dangerous goods, including as activity related equipment, materials for commercial use etc., as well as to transport of cargoes.*

- 18.7.2 *More information may be found in the above regulations, and in MSN 1669: The Merchant Shipping (Fire Protection) Regulations 1998: Special fire safety measures for ships carrying dangerous goods. MSN 1875<sup>4</sup> promulgates recent changes to the requirements for the carriage of dangerous goods.*

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<sup>4</sup> This MSN will be replaced in 2019, and periodically thereafter, to implement the latest version of the International Maritime Dangerous Goods Code (IMDG Code).

## **19                    Navigation**

Rationale: To provide suitable equipment and shipboard facilities and arrangements to navigate the ship safely in the intended area of operation.

### **19.1                Navigational Equipment**

Some of the navigational equipment specified in sections 19.1.1 to 19.1.3 need not be carried in circumstances where it can be demonstrated by risk assessment that the ship can be safely operated and navigated without that equipment, under routine, exceptional and emergency conditions. The risk assessment shall be appraised by the Surveyor in such a case and an exemption from the specific requirement will be issued. This concession has been included to recognise that the risks of specific ship operations may vary significantly within water categories and it may not be appropriate to fit all specified equipment on certain ships. The exemption is to be specified to the intended area of operation and will be withdrawn if the ship is relocated.

For ships of less than 300GT, the equipment specified in 19.1.1 to 19.1.3 need not be of an MED approved type. In this case the equipment should comply with standards acceptable to the Navigation Safety Branch of the MCA.

#### **19.1.1    Ships which operate in Category A Waters**

A ship shall be provided with the following:-

- (1)    Searchlight - Every ship shall carry an efficient searchlight suitable for man-overboard and other search and rescue operations.
- (2)    Navigation Lights and Shapes - When operating at night or in periods of restricted visibility by day, navigation lights and shapes complying with either local Bye-Laws or the Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996, as amended.
- (3)    Appropriate navigational charts and publications for the area of operation; where they are not available, other mapping systems, such as navigation guides, or schematics capable of being used for

passage planning and displaying the ship's route may be accepted.

- (4) Whistle – Every ship shall carry a whistle capable of conducting sound signals at the frequency and range of audibility to the satisfaction of the surveyor and in order to comply with the Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996, as amended or local Bye-Laws.

#### 19.1.2 Ships which operate in Category B Waters

In addition to the equipment specified in 19.1.1, ships shall also be provided with the following:-

- (1) Signalling Lamp - Every ship shall carry a daylight signalling lamp, or other means to communicate by light during day and night using an emergency source of electrical power not solely dependent upon the ship's power supply. The signalling lamp may be the searchlight required by 19.1.1 (1).
- (2) An echo-sounding device, or other electronic means, to measure and display the available depth of water.

#### 19.1.3 Ships which may operate in Category C and D Waters

In addition to the equipment specified in 19.1.1 and 19.1.2, ships shall also be provided with the following:-

- (1) A speed measuring log.
- (2) A rudder angle indicator.
- (3) For all sizes of ship - a properly adjusted magnetic compass or other means, independent of any power supply, to determine the ship's heading.
  - (a) In a steel ship, it shall be possible to correct the compass for coefficients B, C and D, and heeling error
  - (b) The magnetic compass or repeater shall be so positioned as to be clearly readable by the helmsman at the main steering



position. It shall also be provided with an electric light, the electric power supply of which shall be of the twin wire type.

- (c) For Ships under 300GT, the magnetic compass requirement may be met by the use of a Transmitting Electronic Heading Device ("fluxgate compass"), provided that a suitable back up power supply is available to power the compass in the event of failure of the main electrical supply. Where such a compass incorporates a capability to measure magnetic deviation by undertaking a calibration routine, and where the deviation figures are recorded within the device, a deviation card is not required.
  - (d) For ships between 150 and 300GT an additional compass. This may be either a magnetic compass or a Transmitting Electronic Heading Device.
  - (e) For ships between 300 and 500 GT an additional compass. One of the two compasses must be a Transmitting Magnetic Heading Device.
  - (f) For ships of 500GT and over, an additional compass. One of the two compasses on board must be a Gyrocompass.
- (4) A 9 GHz (3cm) radar, or other means to determine and display the range and bearing of radar transponders and other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and collision avoidance.
  - (5) A radar reflector - if less than 150 GT and if practicable, a radar reflector, or other means, to enable detection by ships navigating by radar at both 9 and 3 GHz.
  - (6) Ships operating in category C waters which are large deep lakes or lochs, or in category D waters, shall have a means for taking bearings as near as practicable over an arc of the horizon of 360°. This requirement may be met by the fitting of a pelorus or, on a ship other than a steel ship, with a hand bearing compass.
  - (7) Ships operating in category C waters which are large deep lakes or lochs, or in category D waters, shall have a receiver for a global navigation satellite system or a terrestrial radio navigation system,

or other means suitable for use at all times throughout the intended voyage, to establish and update the ship's position by automatic means.

(8) Where required by local authority, port authority or other navigation authority bye-laws ships shall be fitted with an approved automatic identification system (AIS). The AIS shall:

- (a) automatically provide, to appropriately equipped shore stations, other ships and aircraft, information including the ships identity, type, position, course, speed, navigational status and other safety related information;
- (b) receive automatically such information from similarly fitted ships
- (c) monitor and track ships; and
- (d) exchange data with shore-based facilities.

(9) Navigation Lights, Shapes and Sound Signals

- (a) Ships shall, as far as practicable, comply with the requirements of the International Regulations for Preventing Collisions At Sea, 1972, as amended, or comply with local Bye-Laws.
- (b) All navigation lights shall be provided with both main and emergency power supply.
- (c) With due regard to accessibility, the requirement for duplication for navigation lights required to be shown whilst underway may be satisfied by having a spare lamp that can be easily fitted within three minutes.

## **19.2 Bridge Visibility**

This section sets out the requirements for bridge visibility. In considering bridge visibility it must be remembered that nothing within these requirements absolves the vessel from compliance with the COLREGS, in particular Rule 5. This states that 'Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.'

### **19.2.1 Definitions**

(1) **In this Section –**

"Enclosed passenger deck" means any passenger deck which is, or may be, enclosed by fixed or moveable screens, but does not include a passenger deck which –

- (a) is fitted with a canopy, and
- (b) has no means, either temporary or permanent, for side or end screens to be fitted to the deck or any other part of the ship.

"visibility" means visibility and line of sight over a horizontal arc, and "all-round visibility" means visibility and line of sight over an arc of 360 degrees. Segments of blind sectors of a maximum of 5 degrees will be permitted provided there are no more than 4 segments and they are never closer than 10 degrees together;

"the permitted limits" are –

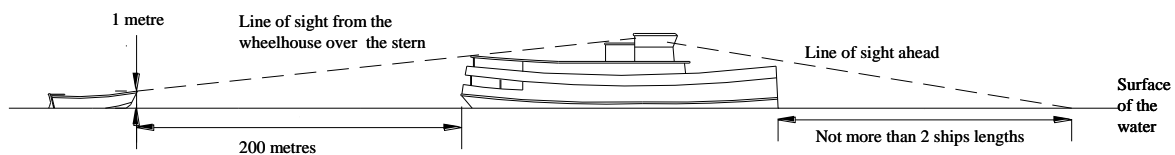
- (a) for a ship with a single steering position, up to 1 metre either side of the steering position, or
- (b) for a ship with two steering positions within the wheelhouse (or wings), between these two positions, or
- (c) for a ship with a mobile controller from which an operator is able to steer the ship from any part of the wheelhouse and bridge wings as appropriate ("wandering lead control"), from side to side of the ship, or the maximum reach of the wandering lead if this is a lesser distance.
- (d) The "permitted limits" shall not apply to arrangements where the helmsman is permanently seated and/or is not able to move freely within these limits.

#### 19.2.2 Visibility from the Bridge

- (1) The steering position shall be placed above all other structures so that the crew are able to gain a view all round the horizon and water surface from the steering position.
- (2) The steering position of a ship shall be so sited and any wheelhouse shall be so constructed, without taking any visual aids into account:-

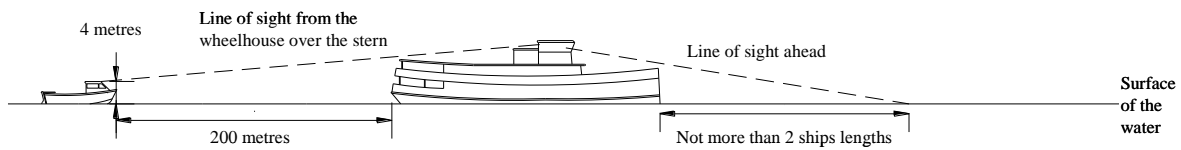
- (a) as to provide the person in charge of the navigation at the steering position with all round visibility, and
- (b) that the helmsman at the steering position can, if necessary by moving across a level and unobstructed deck within the permitted limits—
  - (i) see the surface of the water at a distance of not more than 2 ship's lengths from the ship, over the arc from abeam on either side through right ahead, and
  - (ii) (a) for ships less than 24 metres in length, see an object situated 1 metre above the surface of the water at a distance of 200 metres from the stern of the ship, over the arc from abeam on either side through right astern as shown in figure 1.

Figure 1



- (b) For a ship over 24 meters in length, see an object situated 4 meters above the surface of the water at a distance of 200 meters from the stern of the ship, over the arc from abeam on either side through right astern as shown in figure 2.

Figure 2



(3) For the purposes of paragraph (2) –

The presence of a blind arc of visibility abaft the beam from the steering position shall not prevent visibility from being all round visibility if the helmsman can, by moving horizontally within the permitted limits, obtain visibility over the whole of that blind arc.

Where a ship is designed to be operated by a seated helmsman then there are no permitted limits and the all-round visibility must apply at the helm position.

(4) If the requirements of paragraph 2 cannot be met, a dedicated lookout must be provided.

### 19.2.3 Bridge visibility on category A and B waters

19.2.3.1 In Category A and B waters where the requirements cannot be met because of restricted air draught, alternative arrangements may be considered by the surveyor.

19.2.3.2 If the ship's route includes navigation through narrow passages, such as through narrow bridge arches, a steering position towards the stern of the ship can assist the helmsman greatly in lining the ship up for transiting, but may also restrict their forward visibility. In such a case, the dedicated lookout may be essential.

19.2.3.3 The presence of a blind arc of visibility of no more than 12 degrees and 100m in length directly forward and in line with the deckhouse from the steering position shall not prevent visibility from being all round visibility if the helmsman can, by moving horizontally across the ship or by minor course alterations, obtain visibility over the whole of that blind arc. In such a case a camera providing visibility of the blind area in front of the ship to the helmsman is recommended.

#### 19.2.4 Dedicated lookout

- (1) Any dedicated lookout shall –
  - (a) have the sole duty, while the ship is underway, of maintaining a lookout,
  - (b) be positioned outside the passenger spaces, and
  - (c) be instructed by the master to keep a continuous lookout, and in particular over any or all additional areas where the helmsman cannot see.
- (2) The dedicated lookout may be in the wheelhouse, but if positioned outside the wheelhouse and remote from the helmsman, the lookout shall be provided with a suitable and effective means of communication with the helmsman.

#### 19.2.5 Sight lines

- (1) In determining whether the requirements of 19.2.2 are met, the helmsman shall be assumed to have a height of eye of 1650 mm above the deck at the steering position. When there is an separate officer in charge of the navigational watch directing the helmsman, they shall be assumed to have a height of eye of 1650 mm above the deck at their position.
- (2) Where a sight line, passes through an after facing window, that window shall be of not less than 450 mm depth (height) centered at 1675 mm above the deck at the steering position.

Where the ship is helmed from a seated position, the height of eye shall be adjusted accordingly to the satisfaction of the surveyor.

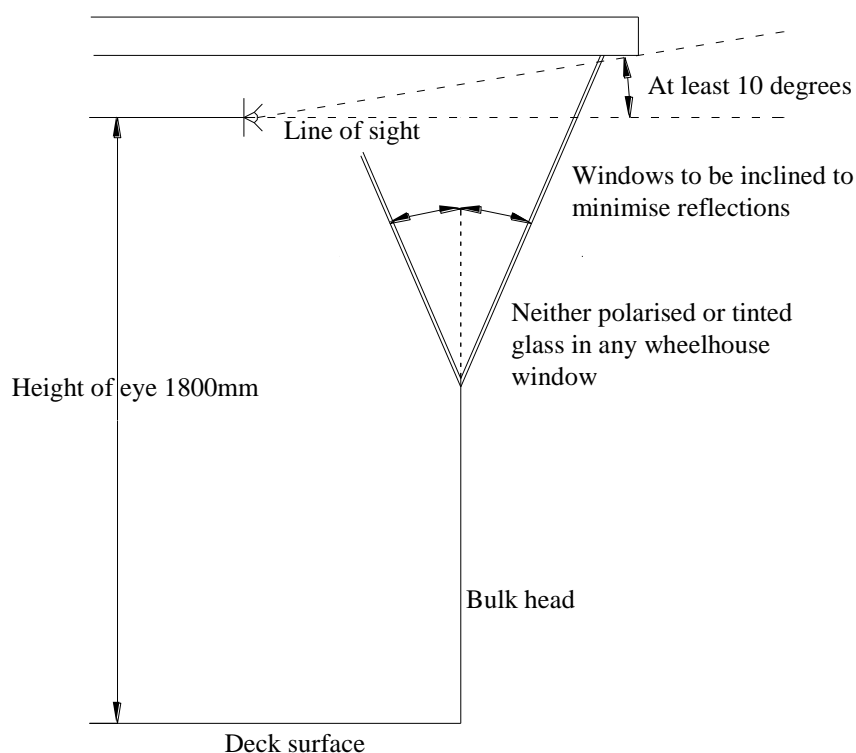
- (3) No sight line shall pass through any enclosed passenger space.
- (4) Any sight line which passes over an open passenger deck shall be such that it would pass over the heads of any passengers occupying seats on that deck.
- (5) Should the activities of standing passengers on an open passenger deck cause a serious obstruction to visibility from the steering

position, a dedicated lookout must be provided.

#### 19.2.6 Windows

- (1) Vertical framing between all windows in the wheelhouse of a ship shall be kept to a minimum and shall not be installed immediately forward of the steering position or positions.
- (2) The height of the lower edge of the forward facing windows of the wheelhouse shall be as low as practicable.
- (3) The upper edge of the forward facing windows of the wheelhouse shall be high enough to allow a person at the steering position with height of eye of 1800 mm a clear forward view to at least 10 degrees above the horizontal at height of eye level.
- (4) The wheelhouse windows shall be inclined from the vertical plane to minimise reflections. Where necessary, and with particular reference to windows inclined inwards at the top, appropriate measures shall be taken to avoid adverse reflection from within from any instruments. All instruments shall be suitably screened to avoid any reflections onto the inside of the window.
- (5) Neither polarised nor tinted glass shall be used in any wheelhouse window.
- (6) There must, in all weathers, be a suitable means of providing a clear view through an adequate portion of the forward facing windows serving the helmsman.
- (7) Adequate ventilation to prevent the build up of condensation must be provided.

Figure 3



## 19.2.7 Cameras and mirrors

19.2.7.1 Cameras and mirrors may be provided to assist the helmsman in close-quarters manoeuvring, such as berthing, but they must not be relied upon to assist in the situational awareness and all-round visibility of the helmsman.

## 19.3 Navigation Operational Requirements

19.3.1 In Addition to items prescribed above, ships shall comply with all other aspects appertaining to Safety of Navigation and with the COLREGS. Ships on fixed routes are not exempt from the requirements of voyage or passage planning requirements and the need at all times to maintain a safe navigational watch.

19.3.2 These regulations also emphasise the Masters discretion for safe navigation in SOLAS Regulation V/34/1: in summary, the master's discretion in decision-making is not to be compromised.



## **20 General Safety**

### **20.1 Safe Movement of Passengers & Crew**

20.1.1 *To aid the safe movement of passengers and crew, ships shall;*

*(1) Be fitted with slip resistant external decks and stairways.*

*(2) Be fitted with an adequate number of handrails and handholds.*

*(3) Minimise potential tripping hazards.*

20.1.2 *Access areas, walkways and working areas shall be adequately lit.*

### **20.2 First Aid Kits**

20.2.1 *Ships operating in Category D waters must comply with the Merchant Shipping and Fishing Ships (Medical Stores) Regulations 1995 (SI 1995/1802), as amended. MSN 1768 (M+F) provides further guidance.*

20.2.2 *Ships operating solely in Category A, B or C waters must carry a standard first aid kit for every 100 passengers or fraction of that number subject to a maximum requirement for 3 kits. There must be a first aid kit in both the galley and any manned engine room, as applicable.*

### **20.3 Carriage of the Code of Safe Working Practices for Merchant Seamen (COSWP)**

20.3.1 *All persons working on the ship shall have access to the COSWP, either in “hard” copy, or electronically. It shall be clearly stated in the ship’s Safety Management System where each copy of the COSWP is kept, or may be accessed.*

### **20.4 Alcohol Licensing**

20.4.1 *The Licensing Act 2003 requires passenger ships selling alcohol or providing regulated entertainment in England or Wales to be licensed. Applications for a license shall be made to the Local Authority.*

20.4.2 *The Licensing (Scotland) Bill 2005 applies in Scotland and applications for a licence shall be made to the local licensing board.*

20.4.3 *The Licensing (Northern Ireland) Order 1996 applies in Northern Ireland and applications for a licence shall be made to the local court.*

## **20.5 Health and Safety Regulations**

20.5.1 *There are a number of Regulations which apply health and safety legislation. A list of the current Regulations at the time of publication is provided in Annex 6.*

20.5.2 *Principal among the health and safety Regulations are The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 which apply wherever “workers” are employed on ships. Under these regulations all employers have a duty to ensure the health and safety of workers and others, so far as is reasonably practicable. To fulfil this duty, employers are required to carry out “a suitable and sufficient assessment of the risks of the health and safety of workers arising in the normal course of their activities or duties“. The concept of risk assessments is relatively simple, and follows these basic steps:-*

- (1) identify the hazards and personnel at risk;*
- (2) assess the chances of a hazardous event occurring;*
- (3) assess the severity or consequences; and*
- (4) depending on the level of risk (the combined hazard and severity), some action must be taken to reduce the risk to as low a level as reasonably practicable. If it cannot be reduced sufficiently, then the activity cannot take place.*

### **20.5.3 Noise**

20.5.3.1 *The Merchant Shipping and Fishing Vessels (Control of Noise at Work) Regulations 2007 provide health and safety requirements regarding the exposure of workers to the risks arising from occupational noise. The Regulations include provisions for:*

- *action values and limit values for daily and weekly exposure to noise,*
- *risk assessment,*
- *elimination of or, where this is not reasonably practicable, reduction of exposure to noise,*
- *actions to be taken at action values and limit values,*
- *prohibition on exceeding limit values,*
- *provision of individual hearing protection,*
- *information, instruction and training for noise-exposed workers,*
- *health surveillance, and*
- *consultation with workers.*

*For details of further information and guidance see Annex 6.*

#### **20.5.4 Vibration**

*20.5.4.1 The Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007 provide minimum health and safety requirements regarding the exposure of workers to the risks arising from vibration. The Regulations impose duties on employers to protect workers who may be exposed to risk from exposure to vibration at work. They make provision for:*

- *exposure limit values and exposure action values,*
- *assessment of risks,*
- *elimination or control of exposure to vibration in the workplace,*
- *worker information and training,*
- *health surveillance,*
- *consultation with workers, and*
- *persons on whom duties are imposed.*

*20.5.4.2 Further guidance is provided in The Code of Practice for Controlling Risks due to whole-body Vibration on Ships and MGN 436 – Whole-body Vibration: Guidance on Mitigating Against the Effects of Shocks and Impacts on Small Ships.*

#### **20.5.5 Personal Protective Equipment**

*20.5.5.1 The Merchant Shipping and Fishing Ships (Personal Protective Equipment) Regulations require all workers to be provided with suitable personal protective equipment where risks cannot be reduced to an acceptable level. Personal protective equipment should be fit for purpose*

*and regularly maintained. MGN 331 and MGN 332 provide further guidance on this.*

## **20.6 Smoking onboard ships**

### **20.6.1 England, Wales and Northern Ireland**

20.6.1.1 *For passenger ships operating in England, Wales or Northern Ireland, there is no legislation that explicitly prohibits smoking onboard. However, the Merchant Shipping and Fishing Vessels (Health and Safety) Regulations 1997 refer to employers ensuring "...the health and safety of workers and other persons so far as is reasonably practicable..."*

20.6.1.2 *It is therefore recommended that ship owners/operators have a written policy in place regarding smoking onboard their ship/s, which is clearly brought to the attention of passengers and crew.*

### **20.6.2 Scotland**

20.6.2.1 *For ships operating entirely in Scotland, smoking onboard passenger ships that are wholly or substantially enclosed is generally prohibited under:-*

- The Prohibition of Smoking in Certain Premises (Scotland) Regulations 2006; and,*
- The Smoking, Health and Social Care (Scotland) Act 2005 and the Prohibition of Smoking in Certain Premises (Scotland) Regulations 2006 (Consequential Provisions) (Scotland) Order 2006.*

*Ship owners/operators in Scotland should refer to this legislation for further details.*

## **21                   Manning**

Rationale: To have onboard sufficient trained and medically fit crew to handle a passenger ship safely and effectively and to deal with any emergency situation onboard the ship.

### **21.1               Minimum Manning Levels**

- 21.1.1 A ship shall be safely manned.
- 21.1.2 The manning matrix at Annex 2 shall be used to determine minimum manning levels in all cases. However, the operator shall consider the specific operation of the ship and provide additional manning as appropriate.
- 21.1.3 Factors which may merit the need for additional crew might include, but are not limited to, ships carrying a rescue boat, ro-ro operations or ships transitting locks or tunnels. In considering the need for additional crew, attention shall be made to the ability to safely navigate the ship and deal with emergency situations effectively.
- 21.1.4 The owner/operator shall submit the proposed crew numbers to the MCA. If acceptable to the MCA an approval will be given in writing, which will specify the date which it takes effect and will include any conditions on which it is given.
- 21.1.5 The number of crew may vary according to the number of passengers carried at any one time.
- 21.1.6 Where persons are engaged onboard, in addition to the operational crews, e.g. waiters, bar staff, entertainers etc., they should be treated as passengers unless they are fully trained as a member of crew who can assist passengers in an emergency.

### **21.2               *Minimum Qualifications.***

#### **21.2.1 Minimum Qualifications of the master**

- (1) *An appropriate Boatmaster's Licence (BML) or Boatmaster's Certificate (BMC) is required for masters of passenger ships. Comprehensive guidance may be found in MSN 1853 – The*

*Merchant Shipping (Boatmasters' Qualifications, Crew and Hours of Work Regulations 2015. Structure and Requirements*

- (2) *For ships fitted with a VHF installation, a GMDSS Short Range Certificate (SRC) is required.*
- (3) *Medical Fitness*  
*A valid medical ML5 fitness certificate is required by the Master. (A seafarer's medical certificate, ENG 1, is acceptable as an alternative)*
- (4) *A Ro-Ro Endorsement is needed by the Master of any vessel in which vehicles or cargo can be loaded or unloaded in a horizontal direction, in addition to the Ro-Ro passenger ships as defined.*

21.2.2 Minimum Qualifications of the Crew

- (1) *The owner of a ship must give notice in writing to the MCA proposing either that it is appropriate or that it is not appropriate that, when the ship is engaged on a voyage, a member of the crew should be the holder of –*
  - (a) *a boatmaster's licence of any class,*
  - (b) *a boatmaster's certificate of any class, or*
  - (c) *any other qualification which it would be appropriate for a master of the ship to hold and which is prescribed for that purpose by the Boatmasters' Qualifications Regulations.*
- (2) *The MCA may approve the ship owner's proposal that –*
  - (a) *a member of the crew should be the holder of a qualification specified in the notice given under paragraph 21.2.2 (1), or*
  - (b) *that no crew member need be the holder of any such qualification.*

## **21.3        Training**

### *21.3.1 Crew Training*

- (1) The operator is to ensure that every person employed or engaged in any capacity on board the ship has received on-board training in the procedures to be observed in the event of an emergency.*
- (2) Training is structured in two levels –*
  - (a) Familiarisation training, and*
  - (b) Competent crew training.*
- (3) Minimum training requirements are provided in Annex 3.*

### *21.3.2 Familiarisation Training*

*Familiarisation training shall ensure that all crew members know what their duties and responsibilities are in the event of an emergency, and that they are familiar with the location and use of safety equipment at their workstation. Familiarisation training can be carried out by a member of the permanent crew provided the onboard training is documented within the Safety Management System.*

### *21.3.3 Competent Crew Training*

- (1) Competent crew training shall ensure that personnel have achieved a level of knowledge and practical ability such that they may be considered as competent crew for the purpose of the Passenger Ship Safety Certificate.*
- (2) Competent crew training may be carried out onboard or in conjunction with a training provider and recorded.*

### *21.3.4        Disability Awareness and Assistance Training*

*Written guidance on disability awareness and assistance training shall be provided for staff directly assisting persons with reduced mobility. This shall include the following, as appropriate:*

**(1) Disability-awareness training**

- (a) Awareness of and appropriate responses to passengers with physical, sensory (hearing and visual), hidden or learning disabilities, including how to distinguish between the different abilities of individuals whose mobility, orientation, or communication may be reduced.*
- (b) Barriers faced by persons with reduced mobility, including attitudinal, environmental/physical and organisational barriers.*
- (c) Recognised assistance animals, including the role and the needs of an assistance animal.*
- (d) Dealing with unexpected occurrences.*
- (e) Interpersonal skills and methods of communication with deaf and hearing impaired people, visually impaired people, speech impaired people and people with a learning disability.*

**(2) Disability-assistance training**

- (a) How to help wheelchair users make transfers into and out of a wheelchair.*
- (b) Skills for providing assistance to persons with reduced mobility travelling with a recognised assistance animal, including the role and the needs of those animals.*
- (c) Techniques for escorting blind and partially-sighted passengers and for the handling and carriage of recognised assistance animals.*
- (d) An understanding of the types of equipment which can assist persons with reduced mobility and a knowledge of how to handle such equipment.*
- (e) Sufficient understanding of the need for reliable and professional assistance. Also awareness of the potential of certain disabled*



*passengers to experience feelings of vulnerability during travel because of their dependence on the assistance provided.*

- (f) When to recognise that assistance and/or passage cannot be granted for Health and Safety reasons and to handle the matter with sensitivity.*

## **21.4       Hours of Work Provisions**

### **21.4.1   Employed Workers (including masters)**

- (1) The hours of work provisions of the Merchant Shipping (Working Time: Inland Waterways) Regulations 2003 (as amended) apply to workers employed on passenger ships.*
- (2) The Regulations provide for a maximum of 14 hours working time in any 24 hour period or 84 hours in any seven day period. However, a worker's weekly working time should not exceed an average of 48 hours over a 52 week "reference period". There is an overall limit of 2304 hours working time within a 12 month period. For further details, please refer to the above regulations and MSN 1876, which provides statutory guidance on them.*
- (3) The above regulations also entitle a worker to:*
  - (a) adequate rest of at least 10 hours in each 24 hour period; and 84 hours in any seven day period*
  - (b) a rest break after more than 6 hours continuous work;*
  - (c) at least 4 weeks paid annual leave and 1.6 weeks in respect of public holidays (each pro-rata for periods of employment of less than one year);*
  - (d) annual free health assessment and health assessment when they normally work at night;*
  - (e) a pattern of working days and rest days which is in accordance with the guidance in MSN 1876 (as amended).*

*(4) In addition, please note that:-*

- Employers must keep records to demonstrate compliance with the regulations;*
- Owners who operate their own ships (e.g. as master) are not covered by these regulations;*
- Special provision is made for the tourist season; and,*
- There is an exception for emergency situations.*

*(5) Breach of an employer duty is a criminal offence and would be enforced by the MCA. Worker entitlements are enforced by the worker or their representatives through an employment tribunal.*

#### *21.4.2 Self – Employed Boatmasters.*

*(1) There are separate requirements for self-employed boatmasters on inland waterways ships. These are under The Merchant Shipping (Boatmasters' Qualifications, Crew and Hours of Work) Regulations 2015.*

*(a) The Regulations allow for a maximum working day of 16 hours provided the master does not navigate/con the ship for more than 10 hours during that time.*

*(b) A 30 minute break must be taken every 6 hours.*

*(2) If in any particular case, the hours of work requirements for self-employed boatmasters are considered inappropriate, an application may be made to the Seafarer Safety and Health Branch of the MCA for an exemption from the requirement(s) concerned. However, such an exemption will not be granted unless the surveyor is satisfied that the safety of the ship will not be impaired by the proposed operational practices.*

#### *21.4.3 Records of Hours of Work*

*The employer is required to keep records of hours worked by employees but these records do not have to be specially created or dedicated to this purpose – they may be included in personnel records, or records kept for the purposes of determining pay. Nor is there any mandatory format for the records. They must however provide the minimum information*

*required (see MSN 1876) to allow the surveyor, or an employment tribunal, to investigate any claim of a breach of the regulations.*

## **21.5 Alcohol and Drugs**

*21.5.1 The Railways and Transport Safety Act 2003 states that any professional master or crew member commits an offence if his ability to carry out his duties is impaired because of drink or drugs.*

*21.5.2 The current prescribed limits and enforcement details can be found in Sections 81-86 of the Act as amended by the Merchant Shipping (Alcohol) (Prescribed Limits Amendment) Order 2015.*

*21.5.3 Operators are encouraged to implement an appropriate drink/drugs policy through the Safety Management System*

## **21.6 Medical Fitness**

*21.6.1 To serve as a boatmaster, qualified licence holders of any of the acceptable qualifications under these Regulations must be medically fit at all times so as not to jeopardise their own and others' safety.*

*21.6.2 An ML5 form and certificate is available on request from any MCA Marine Office, or may be downloaded from the MCA website – address [www.dft.gov.uk/mca](http://www.dft.gov.uk/mca). An ML5 Medical Certificate is valid for a maximum of 5 years for seafarers up to 64. For seafarers 65 and over the ML5 Medical Certificate is valid for a maximum of 1 year.*

*21.6.3 A valid medical fitness certificate must be submitted when applying for a BML, BMC or for any endorsement.*

*21.6.4 At revalidation, BML/BMC holders under the age of 45 must sign a self-declaration on the application form attesting medical fitness. BML/BMC holders aged 45 and over must also submit either a valid ENG1 or an ML5 Medical Certificate issued within the last 5 years with their revalidation application.*

*21.6.5 Whilst the validity periods of the BML and BMC qualifications may differ from that of the medical fitness certificates, it is the individual Boatmaster's*

*responsibility to ensure they are medically fit to serve as master.*

*21.6.6 The MCA may, at its discretion, call for a medical report at other times and has the power to suspend or revoke a licence on the grounds that, for health reasons, the holder is not fit enough to hold it.*

*21.6.7 All BML and BMC holders must notify the MCA issuing office about any changes or deterioration in health that might affect their medical fitness to operate a ship.*

## **22 Passenger Counting and Registration**

Rationale: To record how many people are onboard the ship when it departs any landing point. Such information shall be readily available to emergency services when required.

22.1 The operator shall ensure that, whenever a ship departs any landing point there is a system capable of counting all persons on board which shall include -

- (1) All persons boarding such a ship at a landing point at the beginning of a voyage, or just prior to, as the case may be;
- (2) All persons disembarking at subsequent landing points, during the course of a voyage;
- (3) All persons boarding at subsequent landing points, during the course of a voyage, or just prior to, as the case maybe;
- (4) The number of persons remaining on board at each landing point is to be determined and submitted to the Skipper prior to the ships departure. This number is also to be deposited ashore in such a manner to be immediately available to the Emergency Services as stated in the Search and Rescue (SAR) Plan.

22.2 The system maybe manual, electronic or by any other suitable means and must be approved by the MCA.

## **23 Passenger and Crew Accommodation**

Rationale: Passenger and crew accommodation must allow for rapid and safe evacuation in an emergency, and should provide for their comfort and shelter from weather, as appropriate, at other times.

### **23.1 Maximum Passenger Numbers**

The number of passengers allowed onboard shall be the minimum passenger number as determined to satisfy the:

- (a) Stability requirements given in section 10
- (b) Clear deck area requirements given in section 23.3
- (c) Seating requirements given in section 23.4
- (d) The number of persons lifesaving appliances are provided for in section 12

### **23.2 Allowable Passenger Spaces**

23.2.1 Passenger spaces shall be provided on not more than 3 decks including the top of deckhouses.

23.2.2 Only one passenger deck is permitted below the waterline/bulkhead deck. In the flooded condition there must be a clear air gap between the flooded waterline and deckhead (including linings and structure) of such a passenger space of at least 600 mm. This may be relaxed where the space is protected by full-height watertight compartments of at least 760mm breadth, outboard of the passenger space. This would normally be a single space but the surveyor may permit two spaces of moderate size to be included.

23.2.3 Passenger spaces do not include:

- (1) Crew accommodation
- (2) Toilets
- (3) Companionways/stairways/means of escape
- (4) Any passageway between bulkheads less than 750 mm wide.
- (4) Areas permanently occupied by safety equipment and other ship related operational equipment.
- (5) Areas designed for the safe operation of the ship i.e.

- (a) Machinery/navigation/mooring.
- (b) Enclosed vehicle carrying spaces provided on Ro-Ro ships.
- (c) Open deck vehicle carrying spaces.
- (d) Access routes to such spaces

23.2.4 For open deck spaces the clear deck area shall be measured between points within which the surveyor considers the area fit for the safe and proper accommodation of passengers. It should also be considered whether the bow or stern area is a suitable place for passengers to be permitted to occupy.

23.2.5 Clear deck area for both open and enclosed spaces means the area which remains after that occupied by all encumbrances, such as hatchways, skylights, companionways, casings, ventilators, navigating space, luggage lockers and lifesaving appliances carried on the open deck or in lockers has been deducted. Tables and seating are included within the clear deck area.

### **23.3 Clear Deck Areas**

23.3.1 The number of passengers allowed for a passenger space located below the main deck shall be determined by dividing the clear area in square metres by 0.85.

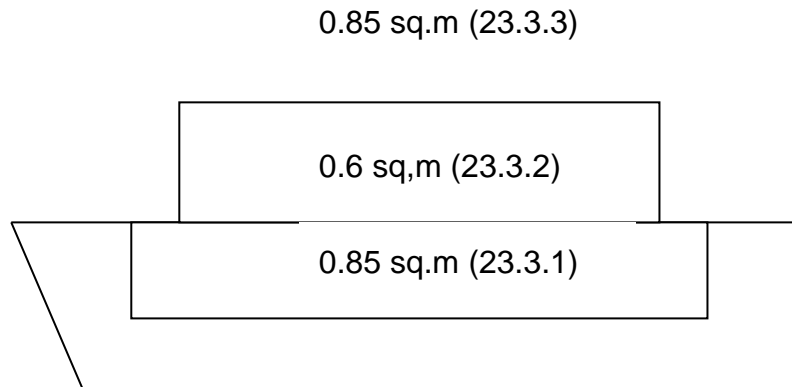
23.3.2 The number of passengers allowed for a main deck or enclosed passenger deck above shall be determined by dividing the clear area in square metres by 0.60.

23.3.3 Where passengers are allowed access to the tops of deckhouses, the number of passengers allowed shall be determined by dividing the clear deck area in square metres by 0.85.

23.3.4 The requirements of 23.3.1, .2 and .3 are illustrated in Figures 23.1 and 23.2 below:

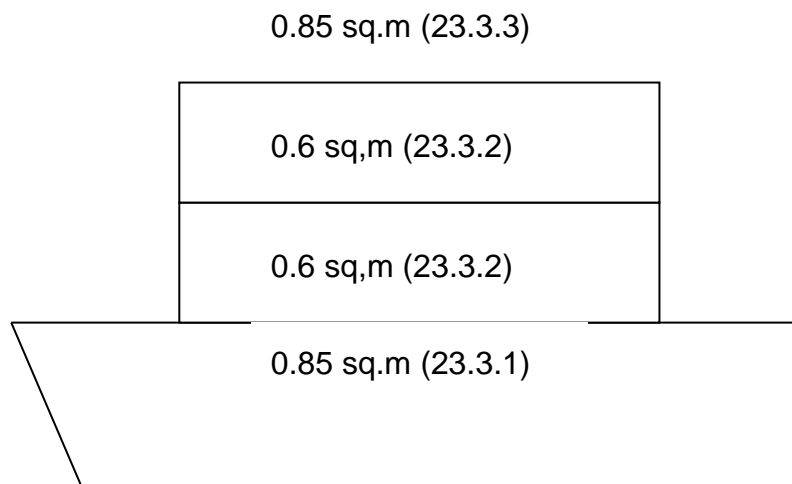
**Figure 23.1 - For a ship with a single storey deckhouse**

Please read this diagram in conjunction with paragraphs 23.3.1 and 23.3.3 above



**Figure 23.2 - For a ship with a two storey deckhouse**

Please read this diagram in conjunction with paragraphs 23.3.1, 23.3.2 and 23.3.3 above.



**Note** – As stated in paragraph 23.2.1 above, passenger spaces may be provided on no more than 3 decks.

## **23.4 Passenger Seating**

- 23.4.1 Every passenger shall be provided with a seat, subject to the concessions given in 23.4.2 and 23.4.3.
- 23.4.2 Ships operating on short voyages of 10 minutes or less need only provide seating for 25% of passengers, provided the motions and accelerations in all normal operations would not make standing difficult.
- 23.4.3 Ships with open ro-ro decks operating on voyages of 30 minutes or less may permit passengers to remain in their vehicles provided there is sufficient clearance between each vehicle lane and between the outboard lane of vehicles and the ship side to allow passengers to escape in an emergency. Seating does not need to be provided for passengers remaining in their vehicles but seating shall be provided for all foot passengers on such voyages. In accordance with 23.4.2, seating need only be provided for 25% of such foot passengers on voyages of 10 minutes or less provided the motions and accelerations in all normal operation would not make standing difficult.
- 23.4.4 Where passengers are permitted to remain in their vehicles, notices shall be displayed to the effect:

THIS AREA MUST NOT BE OVERSTOWED BY VEHICLES AS TO RESTRICT PASSENGER MOVEMENT BETWEEN ASSEMBLY AREAS IN THE EVENT OF AN EMERGENCY.

THERE MUST BE SUFFICIENT CLEARANCE BETWEEN VEHICLES OR OTHER OBSTRUCTIONS TO ENSURE THAT OCCUPANTS CAN READILY VACATE THEIR VEHICLES IN AN EMERGENCY.

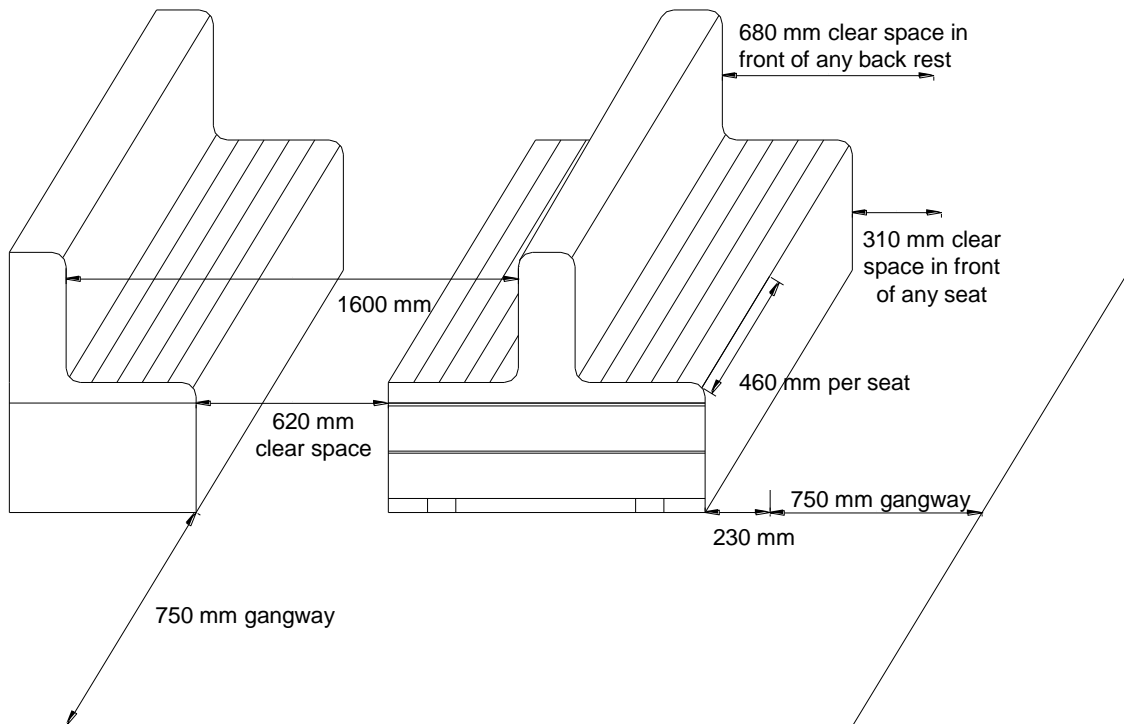
- 23.4.5 All seating and furniture shall normally be fixed. Any moveable furniture may only be permitted provided this would not be a hazard or impede escape in the event of an emergency. Seating may be individual seats or bench type seating.
- 23.4.6 If seating is removed to accommodate a specific operation or function, the number of passengers shall be reduced accordingly.



## **23.5 Minimum seat dimensions**

- 23.5.1 Suitable clear space shall be allowed for access, assembly and escape, with a minimum width of 750 mm being provided.
- 23.5.2 A length of 460 mm measured horizontally along the front of each seat shall be allowed for the accommodation of seated passengers.
- 23.5.3 When any space in front of a seat is required for access, the space within 230 mm of the front of the seat shall not be taken into account when measuring the width of the access.
- 23.5.4 The distance between any part of the back rest of any seat and the back rest of the seat facing it, shall not be less than 1600 mm.
- 23.5.5 There shall be a clear space of at least 680 mm in front of the backrest of any seat measured from the centre of each seat and a clear space of at least 310 mm in front of any part of that seat.
- 23.5.6 There shall be a clear space of at least 620 mm between any part of the front of a transverse seat, and any part of any other seat which faces it.
- 23.5.7 The number of passengers accommodated by bench seating is found by dividing the length in metres of each continuous fixed seat by 0.46, the measurements being taken along the inner edge of the seats. Buoyant apparatus may be used for seating provided the seating dimensions specified above are satisfied.

**Diagram – Minimum seat dimensions**



NOTE: All dimensions stated are minimum requirements

### **23.6 Ships carrying 60 or fewer passengers, where those passengers remain seated throughout the voyage.**

- 23.6.1 Where a ship carries 60 or fewer passengers, those passengers remain seated throughout the voyage, and the only facilities provided onboard that they would need to stand for are the toilets, the number of passengers allowed shall be determined by dividing the clear deck area in square meters by 0.44. The seats shall be in blocks of no more than 20 seats, and the aisle should have direct access to the open deck from which escape can be effected, or there must be direct access overboard to evacuate the ship.
- 23.6.2 In this scenario only, the access aisles to blocks of seating may have their width reduced to 600mm, except in those areas required for access by persons of reduced mobility, escape routes from passenger areas, and routes and areas providing access to survival craft.

## **23.7 Toilet facilities**

23.7.1 Toilet facilities must be provided free of charge for the use of passengers. The number of toilets shall be as follows;

Up to 60 passengers	1 WC
Up to 100 passengers	2 WC
For each additional 100 passengers or part thereof	2 WC or 1 WC and 1 urinal

23.7.2 These requirements may be relaxed for open ships and those ships engaged on voyages of less than 30 minutes duration provided WC facilities are provided in the vicinity of embarkation/disembarkation places.

## **23.8 Crew accommodation**

*Where crew accommodation is provided, the Merchant Shipping (Crew Accommodation) Regulations 1997 will apply.*

## **24 Survey and Certification Requirements**

### **24.1 Certification**

- 24.1.1 To be issued with a certificate for a particular area of operation, a ship must fully comply with all of the requirements of this Code for that operating area to the satisfaction of the surveyor.
- 24.1.2 The Passenger Ship Safety Certificate will be issued by the Secretary of State and will be of the format given in Annex 8.
- 24.1.3 The Passenger Ship Safety Certificate is to be valid for a maximum of five years and shall be subject to the ongoing survey regime of section 24.4 to maintain its validity.

### **24.2 Initial Survey**

- 24.2.1 The ship shall be subject to an initial survey before entry into service. This survey will be undertaken by an MCA surveyor who will survey the ship against the requirements of this Code.
- 24.2.2 Specifically, the surveyor is to satisfy themselves that:
  - (1) The ship holds a valid Partial Declaration of Survey of a Passenger Ship as required by Section 4 of this Code.
  - (2) The ship complies with the mandatory safety requirements identified in Sections 3.1.4 and 3.1.6 of this Code.
  - (3) The ship's Safety Management System fully meets the requirements of Section 16.
  - (4) There is evidence that an initial survey of the radio installation has been undertaken by an MCA authorised person.
  - (5) There is evidence that any LPG installation has been recently inspected by a GAS SAFE approved technician.
- 24.2.3 Provided the surveyor is content that the ship complies with all relevant requirements they will issue a Declaration of Survey For Ships Operating

Solely In UK Categorised Waters to inform the Secretary of State that the ship may be issued a Passenger Ship Safety Certificate For Ships Operating Solely In UK Categorised Waters.

- 24.2.4 Any ship holding an ISM certificate will not be surveyed against the Safety Management System requirements of Section 16 of this Code nor subject to the In-service Verification as required by Section 24.3. Such ships will be subject to a mid-term inspection as required by the ISM Code.

### **24.3 Verification of the Safety Management System**

- 24.3.1 The validity of the Passenger Ship Safety Certificate is subject to a satisfactory verification of the Safety Management System.
- 24.3.2 The MCA will undertake an audit of the operator's company safety management system and a verification of each ship in their fleet at the beginning of the five year period.
- 24.3.3 The MCA will conduct further audits of each ship so that each ship is audited twice in every five year period. This will include an initial verification audit at the beginning of the five year period and an intermediate audit between the 2<sup>nd</sup> and 3<sup>rd</sup> anniversary dates.
- 24.3.4 Operators will undertake internal audit each years. Reports of the internal audits will be submitted to the MCA.
- 24.3.5 The MCA may undertake additional audits at any time.
- 24.3.6 The Passenger Ship Safety Certificate will be endorsed by the MCA surveyor on satisfactory completion of their verification.
- 24.3.7 When a new ship enters service or when a new operator takes up the operation of an existing ship, the new Domestic Safety Management (DSM) Code system implemented onboard will need to be audited prior to issuance of the relevant certificate.
- 24.3.8 In such circumstances, the minimum DSM audit requirements should include i) full review of DSM documentation and resolution of any associated outstanding issues and ii) audit onboard to witness trials of

selected procedures and drill/s for emergency preparedness.

Following completion of above audit and relevant PC Survey, a short term certificate (Combined PC and DSM) may be issued pending a full DSM initial audit onboard, which should be carried out following a short period of service (Eg. 3 months). A full term certificate may only be issued after carrying out a full DSM initial audit including verification of onboard DSM records.

## **24.4 Annual Surveys**

24.4.1 An Annual Survey must be undertaken within the 3 months preceding the anniversary date (the day and month) of each year corresponding to the date of expiry of the ships full term Passenger Ship Safety Certificate.

24.4.2 At the Annual Survey the surveyor is to satisfy themselves that:

- (1) The ship has been issued with a Partial Declaration of Survey (Hull and Machinery) as specified in Sections 4B and 24.5 of this Code.
- (2) The ship complies with the mandatory safety requirements identified in Section 3.1.6 of this Code.
- (3) The ship's Safety Management System fully meets the requirements of Section 16.
- (4) The means of communication has been demonstrated during the annual survey.
- (5) There is evidence that any LPG installation has been inspected by a GAS SAFE approved technician within the 3 months preceding the anniversary date.

24.4.3 Ships holding a valid ISM Certificate would not be subject to survey against the Safety Management System requirements of Section 16, but would be subject to the requirements of the ISM Code.

24.4.4 Where VHFDSC is provided the means of communication shall be demonstrated by a functional radio check undertaken by the MCA surveyor or by an inspection undertaken by a MCA authorised person. Where the primary means of communication is by mobile phone the

Surveyor will verify that lines of communication are effective.

- 24.4.5 Provided the surveyor is content that the ship complies with all relevant requirements the MCA surveyor may issue or endorse the Passenger Ship Safety Certificate For Ships Operating Solely In UK Categorised Waters.

## **24.5 Requirement for a Partial Declaration of Survey of a Passenger Ship**

- 24.5.1 Every ship must be issued with a Partial Declaration of Survey of a Passenger Ship Operating Solely in Categorised Waters (Hull and Machinery) to verify that the condition of the hull, machinery, control systems, electrical arrangements and bilge pumping systems continue to be fit for the purpose intended and continues to comply with the appropriate standards of the Certifying Authority.

- 24.5.2 The Partial Declaration of Survey of a Passenger Ship Operating Solely in Categorised Waters (Hull and Machinery) shall be issued by the Certifying Authority within the 3 months preceding the anniversary date of the Passenger Ship Safety Certificate.

- 24.5.3 The Certifying Authority may be any of the Classification Societies stated in Section 4.3 and 4.7 of this Code or the MCA.

- 24.5.4 Where the MCA is acting as the Certifying Authority the MCA surveyor will assess the ship to verify that the ship:

- (1) is fit for the purpose intended;
- (2) continues to be in accordance with the standards to which the ship was constructed;
- (3) complies with the requirements of Section 24.6 of this Code; and
- (4) complies with the requirements of Section 24.7;

Provided these requirements are satisfied then the MCA will issue a Partial Declaration in respect of the ship.

## **24.6 Inspection of the Outside of the Ship's Bottom**

- 24.6.1 An inspection of the outside of the ship's underwater area is required at every Annual and Renewal Survey. This should be undertaken with the ship out of the water unless alternative arrangements have been agreed by the Administration in accordance with MGN 546 (as amended) or any Marine Guidance Note amending or updating it.

## **24.7 Survey of Propeller Shafts**

- 24.7.1 The surveyor shall be satisfied that the stern gear, including the propeller shaft, is in good working order and will continue to be in a serviceable condition for the period covered by the annual survey. If there is any reasonable doubt, the propeller shaft shall be removed and inspected. In any case the propeller shafts shall be removed and inspected at least once in any five year period.

- 24.7.2 In order to assess whether the propeller shafts shall be removed, the Surveyor shall consider:

- (1) The date the propeller shaft was last withdrawn;
- (2) The date the propeller shaft was last replaced or reconditioned;
- (3) Any records of excessive noise/vibration;
- (4) Any indication that the propeller shaft is bent;
- (5) Any evidence of the intermediate bearings (if any) between the engine (or gearbox) and the stern tube running hot;
- (6) Any evidence of oil consumption in oil lubricated stern gear systems;
- (7) Any evidence of water in the oil reservoir;
- (8) Any evidence of oil leakage past an internal seal;
- (9) Evidence, documented or otherwise, of maintenance work carried out on the stern gear;
- (10) Any comments by the owner/skipper regarding the running condition of the stern gear.

Wherever possible, prior to slipping, the surveyor shall see the engine run with the stern gear engaged to assist in assessing its running condition.

- 24.7.3 In the case of other propulsion types, the surveyor shall assess whether maintenance or servicing is required, in any case the advice of the



manufacturer shall be followed.

## **24.8 Renewal Surveys**

- 24.8.1 A renewal survey must be undertaken within the 3 months preceding the date of expiry of the ship's full term Passenger Ship Safety Certificate.
- 24.8.2 The scope of the renewal survey is as for an Annual Survey as required in Section 24.3.
- 24.8.3 Provided the surveyor is content that the ship complies with all relevant requirements the surveyor will issue a Declaration of Survey For Ships Operating Solely In UK Categorised Waters to inform the Secretary of State that the ship may be issued a new Passenger Ship Safety Certificate For Ships Operating Solely In UK Categorised Waters.
- 24.8.4 If the renewal survey has been completed but a new certificate cannot be issued or placed on board the ship before the expiry of the existing certificate, the MCA surveyor may endorse the existing certificate as valid for a period not exceeding 3 months from the expiry date.

## **24.9 Additional Surveys**

- 24.9.1 The Secretary of State may require an additional survey of the ship to be undertaken following the report of any incident or defect which affects the safety of the ship or following an accident that has been reported.
- 24.9.2 An additional survey, either general or partial, according to the circumstances, shall be made following an important repair or renewal. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively carried out, that the material and workmanship are in all respects satisfactory, and that the ship complies with the provisions of the relevant regulations.
- 24.9.3 The MCA will provide guidance to determine what constitutes an important repair or renewal on request.
- 24.9.4 On completion of a satisfactory additional survey the MCA will issue a survey report to confirm the condition of the ship is satisfactory.

## **PART B**

### **25 Additional Requirements for Ro-Ro Passenger Ships**

**Note:-** Ships carrying vehicles on open weather decks may not come under the definition of “Ro Ro Passenger Ships”. However, many of the requirements below remain best practice.

#### **25.1 Definitions**

25.1.1 In this Part the following expressions have the following meanings –

“doors” includes bow visors and appliances described in section 25.4.1(3);

“length” means the ship’s overall length; and

“loading doors” means the doors described in section 25.4.1(1) to 25.4.1(4) inclusive.

25.1.2 A door shall be deemed to be above the bulkhead deck if the sill of the opening with which it is associated is above that deck.

#### **25.2 Loading and stability assessment**

25.2.1 The intact and damage stability of every ro-ro passenger ship shall be re-examined to ensure the requirements of section 10 continue to be met, whenever considered necessary.

25.2.2 The owner shall ensure that the master is provided with information relating to the ship’s stability during the process of loading and unloading. This information shall be included in the ship’s stability information.

25.2.3 Where any alterations are made or changes occur to the ship so as to materially affect information supplied to the master in accordance with sections 25.2.2, amended information shall be provided.

25.2.4 The information provided pursuant to sections 25.2.2 and 25.2.3 shall be kept on board the ship at all times in the custody of the master.

25.2.5 The master shall use the information provided in accordance with paragraph 25.2.2 and 25.2.3 and, when necessary, make calculations or cause calculations to be made in order to ensure that during loading and

unloading the ship has adequate stability and the freeboard at any door giving access to the hull or to an enclosed superstructure is sufficient to prevent the entry of water.

25.2.6 (1) On completion of the loading and before it proceeds on a voyage the master or an officer appointed for the purpose shall ascertain –

- (a) the ship's draught at the bow and at the stern;
- (b) the trim of the ship by the bow or the stern; and
- (c) the vertical distance from the waterline to the appropriate subdivision load line mark on each side of the ship.

(2) The draughts, trim and the vertical distances ascertained in accordance with section 25.2.6(1) shall be recorded in a book retained on board.

(3) Where relevant, these readings shall be taken when the ship is floating free of any linkspan or other shore infrastructure.

25.2.7 Subject to section 25.2.8, before proceeding on a voyage the master shall –

(1) arrange for the maximum permissible vertical position of the ship's centre of gravity relative to its keel (KG) or the minimum permissible transverse metacentric height (GM) whichever is appropriate to the ship, to be determined, recorded and retained on board; and

(2) ensure that the condition of loading of the ship as recorded in accordance with sub-paragraph 25.2.7(1) is within the permissible standard of stability determined in accordance with sub-paragraph 25.2.6(2) and satisfies all the relevant requirements prescribed in the stability information book.

25.2.8 (1) Where a ship regularly plies to and from the same place in conditions of loading which correspond closely to conditions of loading which are clearly specified in the stability information book and such specified conditions of loading allow a sufficient margin of stability beyond the minimum required for safety purposes to allow for small variations which might occur between a specified condition of loading and the actual loading of the ship, the MCA may approve the

conditions of loading so specified.

(2) When conditions of loading have been approved in accordance with section 25.2.8(1), before the ship proceeds on a voyage the master shall –

(a) ensure that the actual condition of loading of the ship corresponds closely to one of the approved specified conditions of loading; and

(b) record which approved condition of loading the actual condition corresponds to. This record shall be retained on board.

25.2.9 A copy of the information required by section 25.2.8(2)(b) shall be forwarded, as soon as is practicable, to a person nominated by the owner as being responsible and retained in his custody for a period of at least one calendar month.

### **25.3 Watertight integrity from the ro-ro deck (bulkhead deck) to spaces below**

25.3.1 Where vehicle ramps are installed to give access to spaces below the bulkhead deck, their openings shall be able to be closed weathertight to prevent ingress of water below. Such openings shall be alarmed with audible and visual indication to the navigation bridge.

25.3.2 Accesses to spaces below the bulkhead deck are permitted provided they are necessary for the essential working of the ship. Such accesses shall be watertight and alarmed with audible and visual indication to the navigation bridge;

25.3.3 The accesses referred to in paragraphs 25.3.1 and 25.3.2 shall be closed before the ship leaves the berth on any voyage and shall remain closed until the ship is at its next berth.

25.3.4 The master shall ensure that an effective system of supervision and reporting of the closing and opening of such accesses is implemented.

25.3.5 The master shall ensure that the time of the last closing of the accesses is recorded in the logbook before the ship leaves the berth on any voyage.

- 25.3.6 The accesses referred to in 25.3.2 may be opened during the voyage but only for a period sufficient to permit through passage and, if required, for the essential working of the ship, provided that the height of the coaming is at least 600mm on open ro-ro decks and 380 mm on closed ro-ro decks.

## **25.4 Closure of main loading doors**

- 25.4.1 Except in the cases specified in paragraphs 25.4.2 and 25.4.4 the following loading doors –

- (1) gangway and cargo loading doors fitted in the shell or boundaries or enclosed superstructures;
- (2) bow visors so fitted;
- (3) weathertight ramps so fitted and used instead of doors for closing openings for cargo or vehicle loading; and
- (4) cargo loading doors in the collision bulkhead;

shall be closed and locked before the ship leaves its berth and shall be kept closed and locked until the ship has been secured at its next berth.

- 25.4.2 Where a bow visor or a weathertight ramp cannot be opened or closed while the ship is secured at its berth, it may so far as necessary and subject to paragraph 25.4.3 be opened or kept open while the ship approaches or draws away from its berth, as the case may be.

- 25.4.3 In no case shall a loading door be open when the ship is more than one ship's length from the cargo loading or discharging position of its berth.

- 25.4.4 Section 25.4.1 shall not apply to small doors intended to be used for pilot access, fuelling or other matters necessary for the operation of the ship and not intended to be used by passengers or for loading cargo.

## **25.5 Supervision and reporting of closure**

- 25.5.1 Before the ship proceeds on a voyage an officer appointed for the purpose by the master shall –

- (1) verify that every loading door has been closed and locked; and
- (2) report the fact that they have been closed and locked to the master or other officer in charge of the bridge.

25.5.2 Save as permitted by regulation 25.4.2 the ship shall not proceed on a voyage until the report referred to in sub-paragraph 25.5.1(2) has been received by the master or other officer in charge of the bridge.

## **25.6 Closure of weathertight doors in bulkheads**

25.6.1 Weathertight doors above the bulkhead deck (except doors fitted in collision bulkheads to which regulation 25.4 applies) which are fitted in bulkheads which are required to be watertight or weathertight as the case may be and which separate or form the boundary of cargo spaces shall be closed and locked before the ship leaves its berth and be kept closed and locked until the ship has been secured at its next berth.

25.6.2 Weathertight doors above the bulkhead deck fitted in the shell or in bulkheads which are required to be watertight or weathertight, other than those doors described in regulations 25.4.1 and 25.6.1, shall be kept closed whilst the ship is on any voyage except when opened on the express authority of the master.

25.6.3 Any weathertight door which may be opened in accordance with the exception to paragraph 25.6.2 shall be kept clear of obstructions which might prevent its rapid closure.

## **25.7 Closure of bulkheads on the ro-ro deck**

25.7.1 All transverse and longitudinal bulkheads which are taken into account as effective to confine the seawater accumulated on the ro-ro deck shall be in place and secured before the ship leaves the berth and remain in place and secured until the ship is at its next berth.

25.7.2 Notwithstanding the requirements of paragraph 25.7.1, the MCA may permit some accesses within such bulkheads to be opened during the voyage but only for sufficient time to permit through passage and, if required, for the essential working of the ship.

## **25.8 Opening of doors in an emergency**

- 25.8.1 Notwithstanding the provisions of regulations 25.4.1 and 25.6.1, gangway and cargo loading doors may be opened in an emergency but only when the master considers such opening will not put the safety of the ship at risk.

## **25.9 Entries in a record book**

- 25.9.1 Entries shall be made in a book retained on board for recording the following -

- (1) the times of the last closing, in accordance with regulations 25.4.1 and 25.6.1, of the weathertight doors referred to in those regulations and of the next opening of such doors; and
- (2) the times of the opening and closing of any weathertight door pursuant to regulations 25.6.2 and 25.8.

## **25.10 Listing of loading and unloading berths**

- 25.10.1 The owner of the ship shall ensure that the ship is provided with a list (the Berth List) of all loading berths at which it is intended the ship shall load or discharge cargo or vehicles.

- 25.10.2 The Berth List shall list separately for each port which the ship is intended to visit to load or discharge cargo or vehicles –

- (1) the loading berths at which the ship in question can, when so loading or discharging, comply with the requirements of regulation 25.4.1 without relying on paragraph 25.4.2 of that regulation; and
- (2) where it is intended that the ship shall so load or discharge in the manner permitted by regulation 25.4.2, the loading berths at which it will so load or discharge.

- 25.10.3 The berths of the type described in sub-paragraph 25.10.2(2) shall be listed separately from those of the type described in sub-paragraph 25.10.2(1).

25.10.4 An up to date copy of the ship's Berth List shall be supplied to the MCA.

25.10.5 No ro-ro passenger ship shall, except in an emergency, load or discharge cargo or vehicles through a loading door at any berth which is not listed in the ship's Berth List (and in the copy thereof supplied to the Maritime and Coastguard Agency).

## **25.11 Written instructions regarding the opening of weathertight doors**

25.11.1 The owner of a ship shall ensure that the ship is provided with written instructions for operating weathertight doors.

25.11.2 Such written instructions shall be approved by the MCA.

## **25.12 Compliance with written instructions**

No door shall be opened or closed except in compliance with the written instructions provided in accordance with regulation 25.11.

## **25.13 Access opening indicator lights**

25.13.1 Indicators shall be provided for all shell doors, loading doors and other closing appliances fitted to openings which if left open or not properly secured could lead to major flooding of a special category space or ro-ro cargo space.

25.13.2 The indicator system shall be a panel at the navigating bridge consisting of a green indicator light and a red indicator light for each access opening connected to suitable switches at the opening so that the green light will be illuminated on the panel for a particular opening only when the door or other closing appliance is both closed and secured.

25.13.3 All switches or relays shall be connected so that if the door or appliance is not fully closed or properly secured the red light on the panel will illuminate.

25.13.4 The power supply for the indicator system shall be independent of the power supply for operating and securing the doors or closing appliances.



## **25.14 Access to ro-ro decks**

25.14.1 The master or the designated officer shall ensure that, without the expressed consent of the master or the designated officer, no passengers are allowed access to an enclosed ro-ro deck when the ship is underway.

25.14.2 At least one of the means of escape from the machinery spaces where the crew is normally employed shall avoid access to any ro-ro cargo spaces.

## **25.15 Supplementary emergency lighting**

25.15.1 All passenger public spaces and alleyways shall be provided with supplementary electric lighting that can operate independently of the main and emergency sources of electric power for at least three hours when the ship is listed up to 90 degrees.

25.15.2 The illumination provided shall be such that the approach to the means of escape from the space can be seen.

25.15.3 The source of electric power for the lighting shall be accumulator batteries located within the lighting unit that are continuously charged,

25.15.4 The lighting shall be of the maintained type so that any failure of the lamp will be immediately apparent.

25.15.5 The accumulator batteries shall be replaced in accordance with the service life established by the manufacturer having regard to the ambient temperature to which they are subject in service.

25.15.6 A portable rechargeable battery-operated hand lamp shall be provided in every crew space alleyway, recreational space and every working space which is normally occupied unless supplementary emergency lighting as required above is provided.

## **25.16 Structural fire protection**

25.16.1 The boundary bulkheads and decks surrounding ro-ro deck spaces shall be insulated to 'A60' class standard. However, where an open deck space (that is not a passenger space, assembly or evacuation station), a sanitary or similar space or tank, void or auxiliary machinery space having

little or no fire risk, is on one side of the division, this standard may be reduced to 'A-0'.

## **25.17 Fixed fire-extinguishing system and drainage**

25.17.1 Enclosed ro-ro deck spaces shall be fitted with an approved fixed pressure water-spraying system for manual operation which shall protect all parts of any deck and vehicle platform in such spaces.

25.17.2 In view of serious loss of stability which could arise due to large quantities of water accumulating on the deck or decks consequent on the operation of the fixed pressure water-spraying system, scuppers shall be fitted so as to ensure that such water is rapidly discharged directly overboard.

25.17.3 The drainage from ro-ro and car decks shall be of sufficient capacity on both the starboard and the port side to cope with that quantity of water originating from the water spraying system and fire pumps, taking into account the ship's conditions of heel and trim.

25.17.4 A water leakage detection system shall be arranged to provide an indication to the navigation bridge of any leakage through inner and outer bow doors, stern doors, or any other shell doors which could lead to the flooding of special category spaces or enclosed ro-ro cargo spaces.

## **25.18 Television surveillance of enclosed spaces**

25.18.1 A television system shall be installed which shall be capable of transmitting reliable information to the navigating bridge on the condition (including position) of bow doors, stern doors or any other cargo or vehicle loading doors which, if left open or not properly secured, could lead to major flooding of a ro-ro cargo space. Ro-ro cargo spaces shall be continuously patrolled or shall be monitored by a television surveillance system during any voyage so that movement of vehicles in adverse weather or unauthorised entry by passengers can be observed. The system monitors shall be placed at a location that is continuously manned whilst the ship is underway.

## **25.19 Emergency Lockers**

25.19.1 Every ro-ro passenger ship shall be provided with at least one

weathertight emergency locker constructed of steel, or glass re-inforced plastic (GRP) or other suitable material, on each side of the ship. Such lockers shall contain the equipment specified below. Such equipment shall be of good quality and shall be regularly maintained.

25.19.2 The lockers shall be clearly marked and so located on an open deck and as high up in the ship and as near the ship's side as possible that in all foreseeable circumstances the locker, or lockers, on at least one side will be accessible.

### **Equipment**

- 1 Fireman's axe (long handled)
- 1 Fireman's axe (short handled)
- 1 Pin maul (7 lb)
- 1 Crowbar
- 4 Hand lamp/torches
- 6 Padded lifting strops (adult), see note (1)
- 2 Padded lifting strops (child), see note (2)
- 3 Hand-powered lifting arrangement, see note (3)
- 1 Lightweight rigid collapsible ladder at least 3 metres long, see note (4)
- 1 Lightweight rope ladder (equal in length to beam of ship or 10 metres, whichever is less) see note (4)
- 1 First aid kit
- 6 Blankets (sealed in plastic bags) or thermal protective aids
- 4 Sets waterproof jackets and trousers

(1) In ships under 100 metres in length the number of adult lifting strops and lifting arrangements may be reduced to 4 and 2 respectively.

(2) Not required if the adult lifting strop is also suitable for children.

(3) Lifting arrangements to be capable of being used at angles of up to 20° from the horizontal and to have a SWL of at least 150 kg.  
Rope if used to be of a type which features good grip. One end of rope to be fitted with a snap link suitable for securing to lifting strops. Tensile strength of rope and snap link to be at least 1 tonne. Length to be suitable for lowering harness a distance equal to at least 2/3 beam of the ship taking into consideration the type of purchase (if any). If wire used in the lifting arrangement tensile strength and length

to be of equivalent standard.

- (4) Ladder to be capable of supporting one person weighing up to 150 kg and to be provided with means of support at top end when suspended from side escape when ship is on its beam ends.

25.19.3 The equipment shall be so stowed and secured in the locker that it will not drop out when the door or lid is opened when the ship is heeled at an angle of 90°.

## PART C

### 26 Additional requirements for planing and semi-displacement passenger ships which are not High Speed Craft.

#### 26.1 Design Acceleration Levels

26.1.1 The collision design acceleration  $g_{coll}$  shall be calculated, as detailed below. If the calculated value of  $g_{coll}$  is 3 or above, then Chapter 4 of the High Speed Craft Code, as amended, shall be applied in addition to the requirements of this Code. For lesser values of  $g_{coll}$  the requirements of 26.2 – 26.3 shall be applied in addition to the requirements of this Code.

26.1.2 Collision design acceleration  $g_{coll}$  shall be calculated as follows:

$$g_{coll} = 1.2 \left( \frac{P}{g \cdot \Delta} \right), \text{ but not to be taken as greater than } 12$$

where the load  $P$  shall be taken as the lesser of  $P_1$  and  $P_2$ , where:

$$P_1 = 460(M \cdot C_L)^{\frac{2}{3}}(E \cdot C_H)^{\frac{1}{2}}$$

$$P_2 = 9000M \cdot C_L(C_H \cdot D)^{\frac{1}{2}}$$

where the hull material factor  $M$  shall be taken as:

$M = 1.3$  for high tensile steel

$M = 1$  for aluminium alloy

$M = 0.95$  for mild steel

$M = 0.8$  for fibre-reinforced plastics,

$$C_L = \frac{(165 + L)}{245} \left( \frac{L}{80} \right)^{0.4}$$

where the height factor  $C_H = (80 - L)/45$  but not greater than 0.75 or less than 0.3,

where the kinetic energy of the craft at speed  $V_{imp}$  is:

$$E = 0.5 \Delta \cdot V_{imp}^2$$

where the main particulars of the craft are:

L = Length means the overall length of the underwater watertight envelope of the rigid hull, excluding appendages, at or below the design waterline in displacement mode with no lift or propulsion machinery active.

D = Depth of the craft from the underside of the keel to the top of the effective hull girder (m)

$\Delta$  = Craft displacement, being the mean of the lightship and the maximum operational weight (t)

$V_{imp}$  = Estimated impact speed (m/s) = two-thirds operational speed, where operational speed is 90% of maximum speed.

## **26.2 Passenger Accommodation**

26.2.1 Seating shall be fixed and forward or aft facing.

26.2.2 Passengers shall be requested to remain seated throughout the voyage in the passenger announcement and suitable signs shall be displayed in the passenger accommodation.

## **26.3 Navigational Equipment**

26.3.1 Operators must ensure that the navigational equipment provided is suitable for the intended craft, speed and operating environment. A maritime radar with automatic target tracking (e.g. Electronic Plotting Aid (EPA)), Automatic Tracking Aid (ATA) or Automatic Radar Plotting Aid (ARPA) capability shall be installed if appropriate. The Master shall undertake appropriate training for the specific equipment installed.

## **ANNEX 1 - Liquid Petroleum Gas Installation for Domestic Use**

### **1 Definition**

In this section –

“Room-sealed” means an appliance whose combustion system is sealed from the room in which the appliance is located and which obtains air for combustion from a ventilated uninhabited space within the ship or directly from the open air outside the ship and which vents the products of combustion directly to open air outside the ship.

### **2 General Information**

- 2.1 All LPG installations must be inspected and approved initially and annually by a GAS SAFE approved technician and a Certificate provided.
- 2.2 This guidance is based on ISO 10239 and a system constructed to the requirements of this standard or equivalent will be acceptable as long as additionally there is suitable gas detection equipment fitted.
- 2.3 Possible dangers arising from the use of liquid petroleum gas (LPG) open flame appliances in the marine environment include fire, explosion and asphyxiation due to leakage of gas from the installation.
- 2.4 Consequently, the siting of gas consuming appliances and storage containers and the provision of adequate ventilation to spaces containing them is most important.
- 2.5 It is dangerous to sleep in spaces where gas-consuming open-flame appliances are left burning, because of the risk of carbon monoxide poisoning.
- 2.6 LPG is of a greater density than air and, if released, may travel some distance whilst seeking the lowest part of a space. Therefore it is possible for gas to accumulate in relatively inaccessible areas, such as bilges, and diffuse to form an explosive mixture with air, this is also the case with petrol vapours.
- 2.7 A frequent cause of accidents involving LPG installations is the use of unsuitable fittings and improvised “temporary” repairs.

### **3. Stowage of Gas Cylinders**

- 3.1 LPG cylinders, any regulators and safety devices shall be stowed on the open deck (where leakage will not accumulate) or in a compartment that is vapour-tight to the ship's interior and fitted with a vent and drain, so that any gas which may leak can disperse overboard.
- 3.2 The vent and drain shall not be less than 19 mm in diameter, shall run to the outside of the craft and shall terminate 75 mm or more above the 'at rest' waterline. The drain and locker ventilation shall be 500 mm or more from any opening to the ship's interior.
- 3.3 The cylinders and associated fittings shall be positively secured against movement and protected from damage in any foreseeable event.
- 3.4 Any electrical equipment located in cylinder lockers shall be certified safe for use in the potential explosive atmosphere.

### **4. Cylinders and Attachments**

- 4.1 Each system shall be fitted with a readily accessible, manually operated isolating valve in the supply pressure part of the system.
- 4.2 In multiple cylinder installations, in addition to each cylinder shutoff valve there shall be non-return valves near the stop valves. Where there is a change over device (automatic or manual) it shall be provided with non-return valves to isolate any depleted container.
- 4.3 When more than one container can supply a system, the system shall not be used with a container removed unless the unattached pipe is fitted with a suitable gas tight plug arrangement.
- 4.4 Containers not in use or not being fitted into an installation shall have the protecting cap in place over the container valve.

### **5. Fittings and Pipework**

- 5.1 Pipework systems shall comprise of rigid pipes made from solid drawn copper alloy or stainless steel tube. Steel tubing or aluminium or any



materials having a low melting point shall not be used.

5.2 Connections between rigid pipe sections shall be made with hard solder (minimum melting point 450°C). Where a rigid pipe joins a flexible pipe, appropriate compression joints are recommended.

5.3 Where a flexible hose is used, its length shall be kept to a minimum, it shall be protected from inadvertent damage where appropriate, it shall meet the requirement of EN 1763 or equivalent and be installed in a manner that gives access for inspection along its whole length.

5.4 There shall be no joints in the pipework in the engine spaces.

## **6. Appliances**

6.1 All unattended appliances shall be of the room sealed type.

6.2 Cookers and hobs are not considered to be unattended appliances.

6.3 All gas burners and pilot flames shall be fitted with a flame supervision device which will shut off the gas supply to the burner or pilot flame in the event of flame failure.

6.4 A device shall be fitted in the supply pipe from the gas container to the appliance that will automatically shut off the gas in the event of a loss in pressure in the supply line. Manual resetting of this device must be the only means of restoring the supply.

## **7. Ventilation**

7.1 The ventilation requirements of a space containing a LPG appliance shall be assessed against an appropriate standard (e.g. Annex B of ISO 10239) and shall take into account gas burning equipment and persons occupying that space.

7.2 Where ventilators required for LPG appliances in intermittent use can be closed, there shall be appropriate signs at the appliance warning of the need to have those ventilators open before the appliance is used.

## **8 Gas Detection**

- 8.1 Suitable means for detecting the leakage of gas shall be provided in a compartment containing a gas-consuming appliance or in any adjoining space or compartment into which the gas, of greater density than air, may seep.
- 8.2 Gas detectors heads shall be securely fixed in the lower part of the compartment in the vicinity of the gas-consuming appliance and other space(s) into which gas may seep. In areas where the detector head is susceptible to damage in the lowest part of the compartment (e.g. engine space bilge) the detector head shall at least be fitted below the lowest point of ignition.
- 8.3 A gas detector system of a suitable type shall, preferably, be actuated promptly and automatically by the presence of a gas concentration in air of not greater than 0.5 per cent (representing approximately 25 per cent of the lower explosive limit). The detection system shall incorporate a visible and audible alarm, which can be heard in the space concerned and the control position with the ship in operation.
- 8.4 A suitable means for detecting carbon monoxide shall also be provided in all spaces where carbon monoxide may accumulate. The detection system shall incorporate a visible and audible alarm, which can be heard in the space concerned and the control position with the ship in operation.
- 8.5 Gas detection system components (i.e. gas detector head) likely to be in an explosive air/gas atmosphere shall not be capable of igniting that atmosphere.
- 8.6 In all cases, the arrangements shall be such that the detection system can be tested frequently whilst the ship is in service and shall include a test of the detector head operation as well as the alarm circuit, in accordance with the manufacturer's instructions.
- 8.7 The detection equipment shall be maintained in accordance with the manufacturer's requirements.

## **9. Emergency Action**

9.1 A suitable notice, detailing the action to be taken when an alarm is given by the gas detection system, shall be displayed prominently in the ship.

The information given shall include the following:-

- (1) The need to be ever alert for gas leakage; and
- (2) When leakage is detected or suspected, all gas-consuming appliances shall be shut off at the main supply from the container(s). NO SMOKING shall be permitted until it is safe to do so (i.e. the gas leakage has been eliminated and the spaces fully ventilated)
- (3) NAKED LIGHTS SHALL NEVER BE USED AS A MEANS OF LOCATING GAS LEAKS.

## **10 Owner/Operator Testing**

It is strongly recommended that LPG systems are tested for leakage regularly. All connections shall be checked by;

- (1) routine observation of the bubble leak detector (if fitted),
- (2) observation of the pressure gauge for pressure drop with the appliance valves closed and cylinder valve opened then closed (if fitted with gauge on supply pressure side),
- (3) visual inspection,
- (4) manual leak testing, (without breaking into the system),
- (5) testing with soapy water or detergent solution (with appliance-burner valves closed, and cylinder and system valves open).  
CAUTION – Do not use solutions containing ammonia

*If leakage is present, close the cylinder valve and have the system repaired before further use. WARNING – NEVER USE A NAKED FLAME TO CHECK FOR LEAKS.*

## **ANNEX 2 - Manning Matrix**

### **1 Introduction**

- 1.1 This matrix is designed to calculate the minimum number of crew required to handle a passenger ship effectively and deal with any emergency situation on that ship when operating in UK categorised waters.
- 1.2 Additional staff will be required to ensure the safety of passengers in certain circumstances, including ships holding functions onboard or carrying passengers with special needs. Any event at which passengers are not seated in an orderly fashion may be considered to be a function.
- 1.3 Special consideration shall be given to ships carrying rescue boats or ships passing through lock gates. Additional crew will be required to man rescue boats and operate the lock gates; the additional number of crew shall be ascertained by risk assessment.

### **2 Contributing Factors**

The matrix considers the following factors when determining the appropriate number of crew for a passenger ship. This is driven primarily by the need to ensure that all passengers can be kept informed and remain under supervision in the event of an emergency.

**Passenger numbers** It must be possible to inform, instruct and control all passengers with the crew available.

**Survivability standard** In the event of a collision or other failure of the hull structure this will determine the likelihood of having to evacuate the ship.

**Nocturnal operation** Communication with passengers over distance will be more difficult at night with greater scope for confusion. The availability of, and response time from, other ships will differ from that during the day.

**Number of passenger Decks** This affects the ability of passengers to hear or see instructions and reassurance from crew and rescue

services, as well as the ability to ensure the ship is cleared of crew and passengers.

**LSA**

In the event of an evacuation there must be sufficient crew to direct and assist passengers and operate the LSA fitted to the ship in the correct manner.

**Function**

This takes into account the distribution of passengers, and the effects as appropriate of noise and alcohol, which will reduce the ability of crew to attract and keep the attention of passengers.

**Area of operation**

This will affect the availability of rescue services, and the availability of assistance from other ships.

**3 Use of the matrix**

In order to achieve a minimum manning level for a particular ship, the table below needs to be consulted using the following procedure -

- (1) Work down the table, matching each variable to applicable weightings.
- (2) Total up the weightings for each of the variables.
- (3) Use the sum of all the weightings in the index table to achieve the proposed minimum crew numbers required.

Ships which have varying manning modes of operation due to additional risks involved e.g. Day/night or passenger numbers shall perform the calculation separately for each mode.

#### 4 Matrix Table

Variable	Weighting	
Number of Passengers	<u>Passenger Numbers</u>	<u>Weighting</u>
	<60	8
	61-100	12
	101-150	16
	151-200	24
	201-300	32
	301-400	40
	>401	Refer to MCA
Survivability	<u>Type</u>	<u>Weighting</u>
	2 compartment	8
	1 compartment	16
	Buoyancy test	20
	Heel test	24
Day/night operation	<u>Time</u>	<u>Weighting</u>
	Day	8
	Night	16
Functions		<u>Weighting</u>
	No	0
	Yes	10
LSA	<u>Liferafts</u>	<u>Weighting</u>
	0	0
	1	4
	2	8
	3	12
	4	16
	5	20
	6	24
	>7	Refer to MCA
Number of passenger decks	<u>Decks</u>	<u>Weighting</u>
	1	4
	2	8
	3	12
Area of operation	<u>Category</u>	<u>Weighting</u>
	A	0
	B	8
	C	16
	D	24

The resultant index for individual ships is translated into the number of crew as follows:-

<b><u>Index</u></b>	<b><u>Number of Crew</u></b>
77 and Under	2
78-98	3
99-110	4
111-130	5
131 and over	6

## **5            Ships carrying over 400 passengers**

- 5.1            This section aims to explain how crewing levels may be determined for ships carrying over 400 passengers.
- 5.2            Safe manning of the ship is the operator's responsibility, based on their assessment of risks and the characteristics of the ship.
- 5.3            Each of the contributing factors detailed in 1.2 shall be considered when determining the appropriate manning level.
- 5.4            In the light of these factors, the owner must assess the number of crew, in addition to the master, appropriate for that ship.
- 5.5            The owner must then notify the Marine Office dealing with the passenger certificate. The number of crew must be acceptable to the MCA before the Passenger Ship Safety Certificate For Ships Operating Solely In UK Categorised Waters is issued. The agreed number of crew will be shown on the certificate and may vary according to the number of passengers carried at any one time. Variations may also be allowed for day time and night time operation. The certificate will specify the date on which it takes effect and will include any conditions on which it is given.
- 5.6            The manning levels may be validated by emergency drills, in addition to the contributing factors.

## ANNEX 3 - Staff Induction and Familiarisation Training

### 1 Familiarisation Training

Familiarisation training is a requirement for all personnel serving in any capacity onboard these ships.

FAMILIARISATION TRAINING	UK waters			
	Category			
Communicate in English with other persons on board on elementary safety matters	A	B	C	D
Understand safety information symbols, signs and alarms	A	B	C	D
Know how to operate emergency lighting systems and equipment	A	B	C	D
Know how to operate the ship's public address (P.A.) system	A	B	C	D
Know what to do if a person falls overboard	A	B	C	D
Know what to do if fire or smoke is detected	A	B	C	D
Know what to do if the fire or abandon ship alarm is sounded	A	B	C	D
Identify muster points, assembly and embarkation stations	A	B	C	D
Identify emergency exits and escape routes	A	B	C	D
Locate life saving appliances and demonstrate ability to don lifejackets	A	B	C	D
Raise the alarm and have a basic knowledge of the use and types of portable extinguishers	A	B	C	D
Take immediate action upon encountering an accident or other medical emergency, before seeking further medical assistance on board	A	B	C	D
Close and open the fire, weathertight and watertight doors fitted in the particular ship, other than those for hull openings	A	B	C	D
<b>Additional requirements if designated to assist passengers in an emergency</b>				
Awareness of life saving appliances and control plans, including:	A	B	C	D
Knowledge of emergency procedures including chain of command	A	B	C	D
Knowledge of muster lists and emergency instructions	A	B	C	D
Knowledge of emergency exits	A	B	C	D
The ability to assist passengers en route to muster and embarkation stations, including:	A	B	C	D
The ability to give clear reassuring orders in English	A	B	C	D
The control of passengers in corridors, staircases and passageways	A	B	C	D
Maintaining escape routes clear of obstructions	A	B	C	D
Methods available for evacuation of disabled persons or persons needing special assistance	A	B	C	D
Search of accommodation spaces	A	B	C	D
Mustering procedures, including:	A	B	C	D
The importance of keeping order	A	B	C	D
The ability to use procedures for reducing and avoiding panic	A	B	C	D



The ability to carry out, where appropriate, evacuation counts	A	B	C	D
The ability to ensure that passengers are suitably clothed	A	B	C	D
The ability to ensure that passengers have donned their lifejackets correctly		B	C	D
<b>Crowd Management Training Certificate (STCW Section A-V/3 and V/2)</b>				

## 2 Competent Crew Training

Competent Crew training is the minimum level of training that a person shall receive before being recognised as part of the permanent crew for the purpose of the minimum manning recorded on the passenger certificate

<b>COMPETENT CREW TRAINING</b>				
<b>1. Familiarisation Training Completed</b>				
<b>2. Location and use of Lifesaving Appliances*</b>				
<i>Knowledge of abandon ship procedures</i>	A	B	C	D
<i>The difference between a lifejacket and buoyancy aid</i>		B	C	D
<i>The correct method of fitting a lifejacket and buoyancy aid</i>		B	C	D
<i>Man overboard procedures including deployment of lifebuoy and raising the alarm</i>	A	B	C	D
<i>Demonstrate knowledge of the location and use of lifesaving equipment carried on the ship</i>	A	B	C	D
<i>Identify markings on liferafts (or other survival equipment) with regards to number of occupants</i>		B	C	D
<b>Personal Survival Techniques Certificate (STCW Table A-VI/1-1)</b>				
<b>3. Location and use of Fire Fighting Appliances*</b>				
<i>Operation of alarm bells</i>	A	B	C	D
<i>Knowledge of ship fire procedures</i>	A	B	C	D
<i>Under supervision, operation of fire pump and hoses</i>	A	B	C	D
<i>Knowledge of the location and use of fire fighting equipment carried on the ship</i>	A	B	C	D
<i>Identify differing types of fire extinguisher and what type of fire each would be used on</i>	A	B	C	D
<i>Use of ancillary equipment as carried (foam applicators etc.)</i>	A	B	C	D
<b>Fire Prevention &amp; Fire Fighting Certificate (STCW Table A-VI/1-2)</b>				
<b>4. Action in event of emergency*</b>				
<i>Means of recovery of person(s) from the water</i>	A	B	C	D
<i>Action in event of collision at operational level</i>	A	B	C	D
<i>Prepare a liferaft or other survival craft for launching</i>		B	C	D
<i>Man overboard procedures including dropping of lifebuoy and raising the alarm</i>	A	B	C	D

<i>Method used to indicate the ship is in need of urgent assistance and to summon help</i>	A	B	C	D
<b>Personal Survival Techniques Certificate (STCW Table A-VI/1-1)</b>				
<b>5. Personal Safety &amp; Social Responsibility</b>				
Observe Safe Working practices	A	B	C	D
Comply with Emergency Procedures	A	B	C	D
Contribute to effective human relations on board	A	B	C	D
Take precautions to prevent pollution of the marine environment	A	B	C	D
Understand orders and be understood in relation to shipboard duties	A	B	C	D
<b>Personal Safety &amp; Social Responsibility Certificate (STCW Table A-VI/1-4)</b>				
<b>6. Seamanship</b>				
<i>A working knowledge of nautical terms</i>	A	B	C	D
<i>Demonstrate knowledge of the general layout of the ship</i>	A	B	C	D
<i>Knowledge of bends and hitches commonly used on board</i>	A	B	C	D
<i>Correct use of ropes and rigging of fenders</i>	A	B	C	D
<i>Handling, care and use of fibre and steel ropes</i>		B	C	D
<i>Handling, care and stowage of chains and anchors</i>			C	D
<i>Handling, care and use of mooring lines</i>	A	B	C	D
<i>Assist in mooring and letting go a ship</i>	A	B	C	D
<i>Assist in opening, closing and securing of doors, ramps and other hatches and access ways</i>	A	B	C	D
<i>Use of Locks and Swing bridges</i>	A	B	C	
<i>Be able to safely rig a gangway, over side ladder and/or accommodation ladder</i>			C	D
<i>Understand helm orders and be able to steer a course under direction</i>		B	C	D
<i>Understand the duties of lookout and the reporting of lights and objects</i>	A	B	C	D
<i>Basic understanding of the collision regulations (carriage of lights, shapes and sound signals)</i>	A	B	C	D
<b>Efficient Deck Hand (EDH) Certificate</b>				
<b>7. Responsibilities and Regulations</b>				
Basic understanding of an employee's obligations	A	B	C	D
Reporting defects and mechanical/electrical faults	A	B	C	D
Understand onboard line of responsibility and communications	A	B	C	D
Requirements for reporting accidents and incidents to the master or responsible person on board	A	B	C	D
<b>8. Code of Safe Working Practices</b>				
Understand the risks of falling into the water	A	B	C	D
Understand the importance of work place cleanliness	A	B	C	D
Demonstrate the use and care of personal protective equipment	A	B	C	D
Understand the principles for protection of the environment from pollution	A	B	C	D

Understand the methods for the prevention of accumulation of rubbish and debris	A	B	C	D
Precautions to be taken when using calor gas installations and use of gas alarms and testing	A	B	C	D
Understand the principles of a confined space and the precautions to be taken prior to entry	A	B	C	D
<b>9. Communications</b>				
Knowledge of external means of communication available on board the ship	A	B	C	D
Knowledge of internal means of communication available on board the ship	A	B	C	D
<b>10. Passenger Care &amp; Control</b>				
Passenger safety briefing	A	B	C	D
Passenger counting and number recording procedures	A	B	C	D
Duties with respect to passenger muster and evacuation at operational level	A	B	C	D
<b>11. Company/Job Specific Training (To Develop at Company Level as required)</b>				

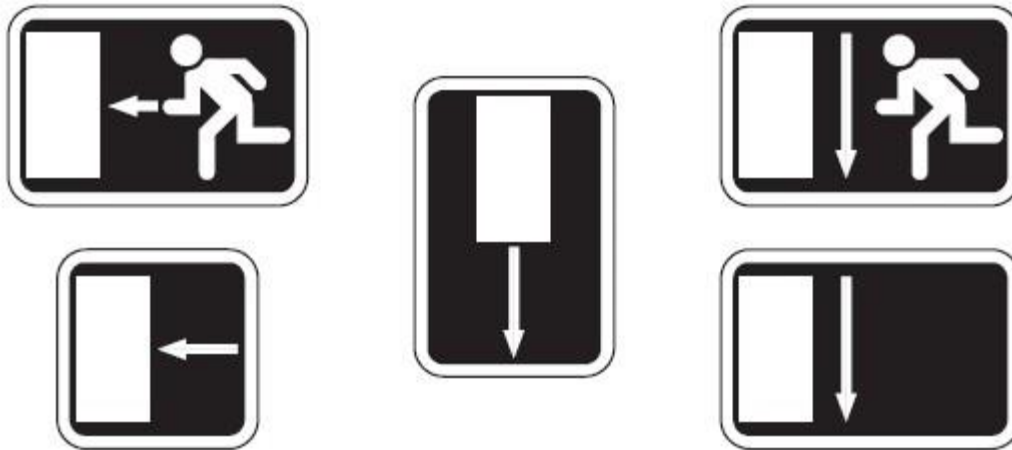
\* Items in *italics* are required prior to operating as a crew member, remainder to be completed within six weeks of being on board.

Where STCW certificates are identified these would provide appropriate training but are not mandatory, provided an equivalent level of training is undertaken.

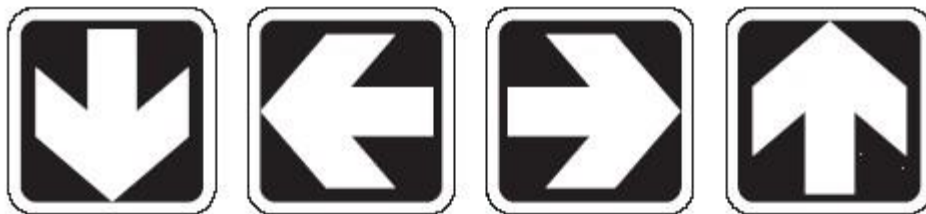
## ANNEX 4 – Signs Onboard

### 1 Safety Signs Onboard

#### 1.1 Exit signs



Emergency exit/escape route

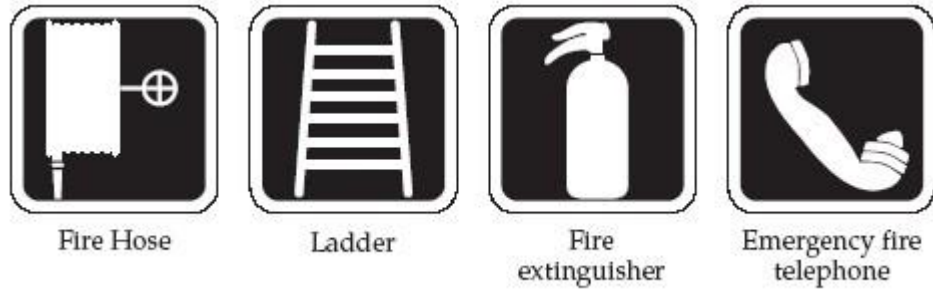


This way  
(supplementary information sign)

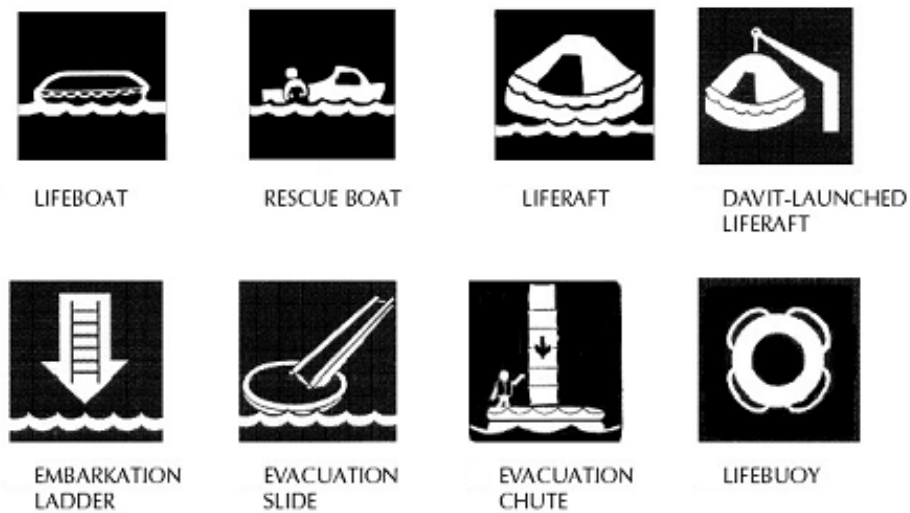


First-aid post

## 1.2 Fire fighting signs



## 1.3 Symbols related to Life Saving Appliances





#### 1.4 Colour of Safety Signs

Colour	Meaning or purpose
Red	Prohibition sign Danger alarm Fire-fighting signs
Green	Emergency escape, first aid signs & signs related to Life Saving Appliances

## **1.5 Additional Signage**

Any additional signage shall:

- Use clear fonts
- Be of an appropriate character size
- Where possible use pictograms rather than text signage.  
Pictograms shall be in accordance with ISO standards or common practice where an appropriate standard does not exist.
- Be in a colour which contrasts with the background against which it is seen, and the characters on the sign shall contrast with the sign board.

## ANNEX 5 - Equipment Standards

Topic	Standard
<b>Construction and Structural Strength:</b>	
Hull construction	Classification Society Rules and Regulations or relevant Certifying Authority requirements, as appropriate to the design and operation of the ship shall be applied.
Windows and side scuttles	<p><u>Categories A, B and C (non-tidal)</u></p> <p>Glass may be “tempered glass” – toughened safety glass which may not necessarily have been tested in accordance with ISO 614, and not therefore marked as such.</p> <p>Glass is normally to be used in accordance with ISO 12216:2002.</p> <p><u>Categories C (tidal) and D</u></p> <p>Glass must be thermally toughened safety glass that meets the standards set out in ISO 21005:2012, tested and marked in accordance with ISO 614:2012.</p> <p>Glass thickness shall be in accordance with classification society rules or in accordance with Lloyds Register Inland Waterway Rules.</p>
<b>Machinery:</b>	
Machinery installations	Classification Society Rules and Regulations or relevant Certifying Authority requirements, as appropriate to the design and operation of the ship shall be applied.
Flexible hoses conveying oil or fuel oil: Pipes & fittings, valves and flexible pipe assemblies.	<p>ISO 15540 - Fire resistance of hose assemblies - Test methods</p> <p>ISO 7840 – Small Craft Fire Resistant Fuel Hoses.</p>



<b>Electrical Arrangement:</b>	
Electrical installations	Classification Society Rules and Regulations or relevant Certifying Authority requirements, as appropriate to the design and operation of the ship shall be applied; or individual requirements below.  BS 8450:2006 - Code of practice for installation of electrical and electronic equipment in ships
Low location lighting emergency lighting	ISO 15370: 2001 and IMO A752 (18)
Daylight signalling lamp	MED approved
<b>Lifesaving Appliances:</b>	
Liferafts:	
ORIL	MCA approved
Other types	MED approved
Launching appliances using davits	MED approved
Rescue boat	MED approved
Buoyant apparatus	MCA Approved
Lifebuoys:	MED approved
Lifebuoys with self activating smoke signals	MED approved
Position-indicating lights for life-saving appliances	MED approved
Lifejackets	MCA approved, MED approved, BS EN 394 and 396:1994 or ISO 12402: Part 1, 2 or 3
Lifejacket lights	SOLAS (LSA Code 2.2.3), IMO Res MSC 81(70), ISO12402-8:5.8 or MED approved
Buoyancy Aids	BS EN 395:1994 (CEN 100N Standard) or MCA approved

Child lifejackets	MED approved
Pyrotechnics/Line-throwing appliances	MED approved
MES	MED approved
Public address/General alarm system	No detailed testing standards
Means of Recovery of persons from the water	MCA approved
Retro-reflective material	MED approved
<b>Fire Safety:</b>	
Fire Safety Systems Portable fire extinguishers	Fire Safety Systems (FSS) Code MED approved or BS EN 3 Part 1 to 6;1996
Fixed fire extinguishing system - sprinkler systems	MED approved
CO2 fire fighting systems	MED approved
Fixed fire detection and fire alarm system components	MED approved
Fire hoses and nozzles	MED approved
Deep fat cooking equipment fire extinguishing systems components (automatic or manual)	MED approved

<b>Miscellaneous Equipment:</b>  Anchors and chain cables	Classification Society Rules and Regulations or relevant Certifying Authority requirements, as appropriate to the design and operation of the ship shall be applied or, where special consideration may be necessary due to the operation of the ship, approval should be sought from the MCA
<b>Radio Equipment:</b>  Transceiver (Fixed) Facility	MED approved
DSC facility	MED approved
Watchkeeping facility	MED approved
Survival Craft Two Way VHF	MED approved
<b>Navigation:</b>  Navigation lights	Local Bye-Laws or the International Regulations for Preventing Collision at Sea, 1972, as amended.
Compass	MED approved
GPS	MED approved
Radar	MED approved
Echo sounder	MED approved
Radar reflector	MED approved
Automatic Identification System (AIS)	SOLAS Chapter V

Universal automatic identification system equipment (AIS)	MED approved
<b>Fire Extinguishing Systems for Machinery Spaces with a Power Output greater than 375kW</b>	
Fixed pressure water spraying system	MED approved
Fixed gas fire extinguishing system	MED approved
High expansion foam system	MED approved
<b>Additional requirements for planing and semi-displacement passenger ships:</b>	Chapter 4 of the High Speed Craft Code

## ANNEX 6 - Applicable Legislation and Guidance

This Appendix provides an indicative list of the Merchant Shipping Regulations applicable at the time of publication of this Code. Other regulations may be in force, and may come into force which will also apply to Passenger Ships operating solely on categorised waters. Legal advice should be sought for clarification on whether a Statutory Instrument applies to a particular ship. It is the responsibility of the owner/managing agent and skipper to ensure that they are complying with the relevant applicable legislation. Furthermore, all of the documents listed in this Annex are subject to revision. Please make sure that you refer to the latest version.

Topic	Guidance
<b>High Speed Craft (HSC)</b>	The Merchant Shipping (High Speed Craft) Regulations 2004 (S.I. 2004/302)
<b>Life-saving Appliances:</b> Retro-reflective material	IMO Resolution A.658 (16) - Use and Fitting of Retro-Reflective Material on Life-Saving Appliances
<b>Fire Safety:</b>  Procedure for testing and approval of fire protection media for use with composite and wooden materials	MGN 407 Procedure for Testing and Approval of Fire Protection Media for Use with Composite and Wooden Constructions  MGN 276 Fire Protection – Maintenance of Portable Fire Extinguishers  MGN 354 Fishing and Small Vessels - Safe Operation of Fixed CO2 Gas Fire Extinguishing Systems  MGN 389 Operating Instructions and Signage for Fixed Gas Fire-Extinguishing Systems
Use of barbeques and pig roasts	MGN 406 M+F (2010) - Use of barbeques (BBQ's) and pig roasts on ships and fishing vessels

<b>Navigation:</b>	
Radar reflectors	MGN 349 (2007) - Carriage and Use of Radar Reflectors on Small Vessels
Boatmasters Licence and Hours of Work	The Merchant Shipping (Boatmasters' Qualifications, Crew and Hours of Work) Regulations 2015, SI 2015 No 410. MSN 1853 (M) - The Merchant Shipping (Boatmasters' Qualifications, Crew and Hours of Work) Regulations 2015. Structure and Requirements
Crew Regulations	The Merchant Shipping (Boatmasters' Qualifications, Crew and Hours of Work) Regulations 2015, SI 2015 No 410.
<b>General Safety:</b> Health & safety at work	MGN 20 M+F - Implementation of EC Directive 89/391 Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997. SI 1997 No 2962.
Safety Management System	Ships complying with the Safety Management System requirements of Section 16 of the Code may find additional guidance in MGN 536 (M) helpful. Ships complying with the ISM Code may refer to The Merchant Shipping (International Safety Management (ISM) Code) Regulations 2014, SI 2014 No. 1512.
Risk Assessment	Code of Safe Working Practices for Merchant Seafarers (COSWP), Chapter 1, Annex 1.2.
Accident Reporting	The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, SI 2012 No. 1743
Meeting the needs of persons with reduced mobility	Marine Guidance Note MGN 306 – Designing and Operating Smaller Passenger Vessels: Guidance on Meeting the Needs of Person with Reduced Mobility
Posters and signage	The Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001

General health and safety regulations	<p>The Merchant Shipping (Entry into Dangerous Spaces) Regulations (SI 1988 No 1638).</p> <p>The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Employment of Young Persons) Regulations (SI 1998 No 2411)</p> <p>The Merchant Shipping and Fishing Vessels (Manual Handling Operations) Regulations (SI 1998 No 2857)</p> <p>The Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations (SI 1999 No 2205)</p> <p>The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations SI 2006 No 2183)</p> <p>The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations, SI 2006 No 2184.</p> <p>The Merchant Shipping and Fishing VesselShips (Health and Safety at Work) (Biological Agents) Regulations 2010, SI 2010 No 323.</p> <p>The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Chemical Agents) Regulations 2010, SI 2010 No 330.</p> <p>The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Work at Height) Regulations 2010, SI 2010 No 332.</p> <p>The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Asbestos) Regulations 2010, SI 2010 No 2984.</p>
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	The Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Artificial Optical Radiation) Regulations 2010, SI 2010 No 2987.
Safe Movement of Passengers and Crew	MGN 532 Safe Movement On Board Ship
Crew accommodation	Merchant Shipping (Crew Accommodation) Regulations 1997, SI 1997 No 1508
Noise Vibration	Merchant Shipping and Fishing Vessels (Control of Noise at Work) Regulations 2007, SI 2007 No. 3075 Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007, SI 2007 No. 3077
First aid kits	Merchant Shipping Notice MSN 1768 - Ship's Medical Stores
Alcohol licensing	The Licensing Act 2003  The Licensing (Scotland) Bill 2005  The Licensing (Northern Ireland) Order 1996
Hours of work provisions	<u>Employed Boatmasters and Workers</u> The Merchant Shipping (Working Time: Inland Waterways) (Amendment) Regulations 2017. <i>These Regulations implement Council Directive 2014/112/EU implementing the European Agreement concerning certain aspects of the organisation of working time in inland waterway transport, concluded by the European Barge Union (EBU), the European Skippers Organisation (ESO) and the European Transport Workers' Federation (ETF). Further guidance on the above legislation may be found in MSN 1876 (as amended).</i>  <u>Self-Employed Boatmasters</u> The Merchant Shipping (Boatmasters' Qualifications, Crew and Hours of Work) Regulations 2015, SI 2015 No 410
Alcohol and drugs	The Railways and Transport Safety Act 2003, Sections 81 – 86



Smoking	<p><u>England, Wales and Northern Ireland</u></p> <p>No legislation.</p> <p><u>Scotland</u></p> <p>- The Prohibition of Smoking in Certain Premises (Scotland) Regulations 2006; and,</p> <p>- The Smoking, Health and Social Care (Scotland) Act 2005 and the Prohibition of Smoking in Certain Premises (Scotland) Regulations 2006 (Consequential Provisions) (Scotland) Order 2006.</p>
<b>Pollution Prevention:</b>	MSN 1807 (M+F) - The Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008, SI 2008 No 3257.
Garbage management	
Sewage waste	MSN 1807 (M+F) - The Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008, SI 2008 No 3257.
Sulphur content of fuel	Merchant Shipping (Prevention of Air Pollution from Ships) Regulations 2008, SI 2008 No. 2924.
Engine emissions	Merchant Shipping (Prevention of Air Pollution from Ships) Regulations 2008, SI 2008 No. 2924.
Oil/Oily waste	Merchant Shipping (Prevention of Oil Pollution) Regulations 1996, SI 1996 No. 2154.
Antifouling paints	Regulation EC 782/2003 of the European Parliament and of the Council of 14 April 2003. The prohibition of organotin compounds on ships.
Port Waste Reception Facilities	Merchant Shipping and Fishing Ships (Port Waste Reception Facilities Regulations) 2003, SI 2003 No 1809, as amended.
Dangerous Cargoes and Marine Pollutants	Merchant Shipping (Dangerous Goods and Marine Pollutant) Regulations 1997, SI 1997 No 2367)
<b>Miscellaneous</b>	
Passenger counting and registration	<p>MSN 1794 (M+F) - Counting and registration of persons on board passenger ships</p> <p>The Merchant Shipping (Counting and Registration of Persons on Board Passenger Ships) Regulations 1999, SI 1999 No. 1869</p>

## ANNEX 7 - The Heeling Test and Freeboard Measurements for Open Ships

### 1. Introduction

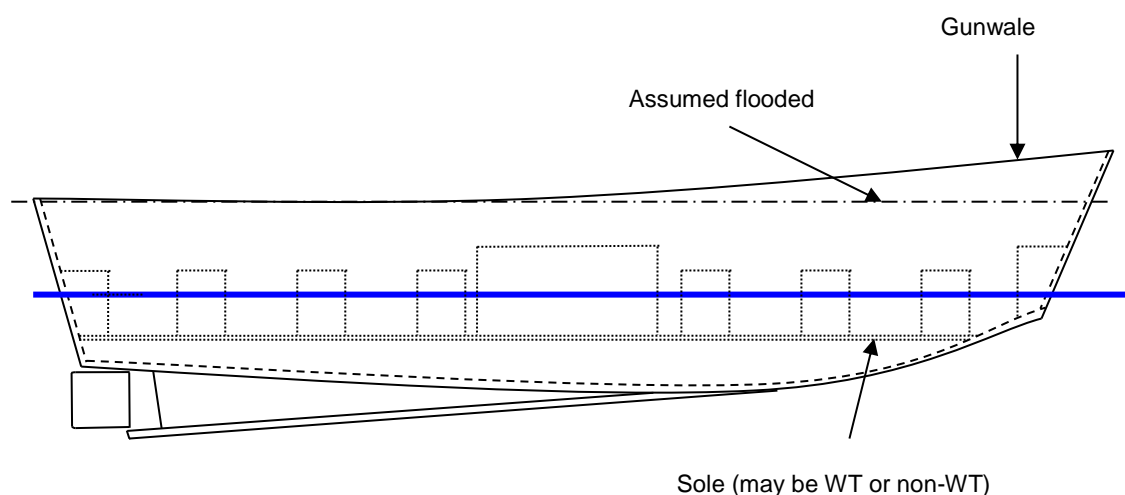
1.1 The diagrams in Section 2 below provide additional guidance for conducting heeling tests and freeboard measurements on open ships.

1.2 The general principles and assumptions for heeling tests are set out in Section 10 of this Code, and those for freeboard measurements in Section 11. Detailed procedures for those tests may be found in the MCA's Instructions to Surveyors (ItoS or "MSIS") number 9 – Approval of Stability Information, Annex 2 – Heel Test Procedures. MSIS 9 is available on the DfT website under:-

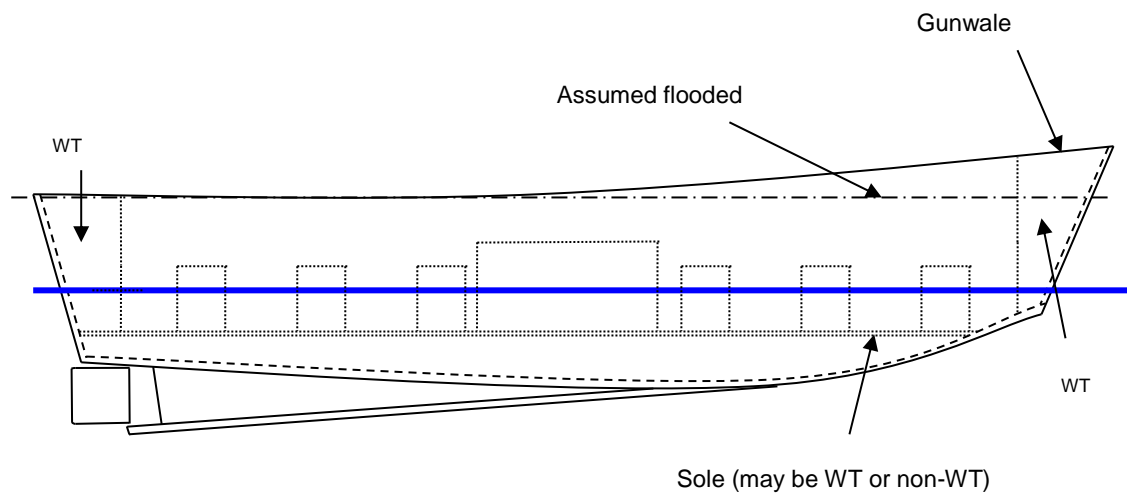
<https://www.gov.uk/government/publications/approval-of-stability-information-msis-9>

1.3 Where there are any differences between the numerical values given in Sections 10 and 11 of this Code, and those in MSIS 9, the values in this Code are to be used.

### 2. OPEN SHIP DIAGRAMS (see Section 10, paragraph 10.1.1)



2.1 Note: The inherent (built-in) buoyancy of the ship above comprising the buoyancy (below the assumed flooded waterline) of the shell, structure, engine, tanks, seats and their supporting structure, fittings etc., may be taken into account when assessing the required buoyancy.



2.2 Note: In the case above, provided the spaces at the forward and after end of the ship are watertight, the part of their volume below the assumed flooded waterline, can also be included in the buoyancy.

## **ANNEX 8**

### **Format of Certificates Associated with the Passenger Ship Safety Certificate**

*The link shown below is to specimen versions of the following forms.*

**Declaration of Survey;**

**Form of certificate - MSN 1823 (original version);**

**Form of certificate - MSN 1823 Edition 2.**

<https://www.gov.uk/government/publications/annex-8-sample-passenger-ship-safety-certificates>

## **ANNEX 9**

### **Partial Declaration Of Survey Of A Passenger Ship Operating Solely In UK Categorised Waters (Hull And Machinery)**

*The link shown below is to a specimen version of the Partial Declaration form.*

#### **Partial Declaration**

<https://www.gov.uk/government/publications/annex-9-sample-partial-declaration-certificate>