

**DRAFT 2**  
**FOLLOWING CONSULTATION**

**SMALL COMMERCIAL VESSEL CODE**  
**BAILIWICK OF GUERNSEY**

**(SCV (BoG) CODE)**

## Table of Contents

PREAMBLE.....	10
1. APPLICATION AND INTERPRETATION .....	11
1.1 Application .....	11
1.2 Definitions .....	12
1.3 Areas of Operation .....	17
SECTION A – ALL VESSELS .....	18
A1.0 VESSEL SURVEY AND CERTIFICATION.....	18
A1.1 Introduction .....	18
A1.2 Code Compliance Certificates and Code Compliance Passenger Vessel Certificates ....	18
A1.3 Posting of certificates, permits and stability letters .....	20
A1.4 Small Commercial Vessel Certificate of Compliance .....	20
A1.5 General survey requirements.....	21
A1.6 Initial and renewal surveys.....	21
A1.7 Verification of the Safety Management System .....	21
A1.8 Extension of certificates .....	22
A1.9 Inspection of the outside of the vessel’s underwater area.....	22
A1.10 Survey of propeller shafts (vessels carrying more than 12 passengers) .....	22
A1.11 Additional inspections .....	23
A1.12 Maintenance of conditions after survey .....	23
A2.0 SAFETY, LIFE SAVING APPLIANCES AND EQUIPMENT .....	25
A2.1 Lifesaving appliances .....	25
A2.2 Liferafts .....	25
A2.3 Liferaft assembly, evacuation, stowage and embarkation arrangements .....	28
A2.4 Lifejackets.....	29
A2.5 Lifebuoys .....	30
A2.6 Distress flares and pyrotechnics.....	30
A2.7 Radio lifesaving equipment .....	30
A2.8 Means of recovery of persons from the water .....	31
A2.9 Operational requirements.....	31
A3.0 COMMUNICATIONS .....	33
A3.1 Radio communications equipment compliance .....	33
A3.2 Radio Installation.....	33
A3.3 Radio equipment .....	34
A3.4 Distress alerting.....	34
A3.5 “Last mile” pin-point homing .....	34

A3.6	Other items.....	35
A3.7	Maintenance requirements.....	35
A3.8	Radio personnel.....	35
A3.9	Position updating.....	35
A3.10	Watches.....	36
A3.11	Portable communication .....	36
A4.0	EMERGENCY INFORMATION FOR PASSENGERS.....	37
A4.1	Safety broadcasts .....	37
A4.2	Public address systems.....	37
A4.3	System requirements .....	37
A4.4	Passenger emergency instructions notices .....	38
A4.5	Passenger emergency instructions announcement .....	38
A5.0	NAVIGATION .....	39
A5.1	Introduction.....	39
A5.2	Navigational equipment .....	39
A5.3	Navigation lights, shapes and sound signals .....	41
A5.4	Dedicated lookout .....	41
A5.5	Cameras, mirrors and other aids.....	42
A6.0	ACCESS AND MOORING .....	43
A6.1	Means of access .....	43
A7.0	GENERAL SAFETY.....	44
A7.1	Safe movement of passengers and crew .....	44
A7.2	First aid kits.....	44
A7.3	Carriage Of The Code Of Safe Working Practices For Merchant Seamen (COSWP) .....	44
A8.0	MANNING.....	45
A8.1	Minimum manning levels .....	45
A8.2	Single handed operations (12 & Under only) .....	45
A8.3	Hours of work provisions.....	47
A8.4	Records of hours of work .....	47
A8.5	Alcohol and drugs.....	47
A8.6	Emergency duties.....	48
A9.0	LICENSING OF BOATMASTERS, ENGINEERS AND CREW .....	49
A9.1	Master .....	49
A9.2	Engineers .....	49
A9.3	Competent crew .....	50
A9.4	Licence issue, standards and conditions .....	50

A9.5	Grades and vessel restrictions of Boatmaster licences.....	51
A9.6	Requirements for obtaining a Boatmaster licence.....	52
A9.7	Practical instruction.....	52
A9.8	Examination for Boatmaster licences.....	53
A9.9	Vessel restrictions of Boat Engineer licences.....	53
A9.10	Requirements for obtaining a Boat Engineer licence.....	54
A9.11	Approved course .....	54
A9.12	Examination for Boat Engineer licences.....	54
A9.13	Existing licences.....	55
A9.14	Period of validity and renewal of licence .....	55
A9.15	Medical fitness certificate .....	56
A9.16	Record and surrender of licences.....	56
SECTION B – VESSELS CARRYING MORE THAN 12 PASSENGERS .....		57
B1.0	MEANS OF ESCAPE.....	57
B1.1	Introduction .....	57
B1.2	Means of escape – all vessels.....	57
B1.3	Minimum widths .....	58
B1.4	Stairways .....	58
B1.5	Windows.....	58
B1.6	Doors .....	58
B1.7	Public rooms.....	59
B1.8	Other .....	59
B2.0	SEARCH AND RESCUE (SAR) REQUIREMENTS .....	60
B2.1	SAR Plan.....	60
B2.2	SAR Exercises .....	60
B3.0	ACCESS FOR PERSONS WITH REDUCED MOBILITY.....	62
B3.1	General .....	62
B3.2	Ramps .....	63
B3.3	Handrails.....	63
B3.4	Doors on vessels.....	64
B3.5	Recommended space allowances .....	64
B4.0	WATERTIGHT INTEGRITY.....	66
B4.1	Watertight subdivision .....	66
B4.2	Weatherdeck .....	66
B4.3	Partial subdivision above the bulkhead deck.....	68
B4.4	Marking of valves, doors and mechanisms .....	68

B4.5	Windows.....	68
B4.6	Routine inspections for watertight integrity.....	68
B5.0	MACHINERY.....	70
B5.1	Machinery requirements.....	70
B5.2	Control of propulsion machinery .....	70
B5.3	Means of manoeuvring and going astern .....	71
B5.4	Steering gear .....	72
B5.5	Means for stopping machinery, shutting off flammable oil supply pipes, pumps and closing of openings .....	73
B5.6	Fuel and associated pipework.....	73
B6	ELECTRICAL ARRANGEMENT .....	76
B6.1	Electrical requirements .....	76
B6.2	Emergency power .....	76
B7.0	Bilge Pumping .....	79
B7.1	General .....	79
B7.2	Fixed bilge pumping requirements.....	80
B7.3	Bilge valves .....	80
B7.4	Requirements for bilge pumps and bilge suction.....	80
B7.5	Arrangement of bilge pipes .....	81
B7.6	Precautions against flooding through bilge pipes .....	81
B7.7	Bilge alarms .....	81
B7.8	Alternative means of compliance for small vessels .....	82
B8.0	INTACT AND DAMAGE STABILITY CRITERIA .....	83
B8.1	Intact Stability (Directive requirements PART B-1) .....	83
B8.2	Subdivision and Damage Stability (Directive requirement PART B-2).....	84
B8.3	Stability of simple vessels.....	86
B8.4	Stability information.....	87
B8.5	Subsequent stability verifications .....	87
B9.0	FREEBOARD AND FREEBOARD MARKING .....	89
B9.1	Draught marks .....	89
B9.2	Freeboard Marking.....	89
B9.3	Assigning of freeboard .....	89
B9.4	General compliance.....	89
B9.5	Sounding arrangements .....	90
B10.0	FIRE SAFETY.....	91
B10.1	High risk areas .....	91

B10.2	Fixed firefighting arrangements .....	91
B10.3	Portable fire extinguishers .....	93
B10.4	Firefighting systems for machinery spaces, other than those of Category A, containing Internal Combustion Machinery .....	95
B10.5	Firefighting systems for machinery spaces of Category A .....	95
B10.6	Fire detection in machinery spaces.....	96
B10.7	Fire protection of machinery spaces .....	96
B10.8	Fire protection of passenger and crew accommodation .....	96
B10.9	Fire safety for galleys and cooking facilities .....	97
B10.10	Availability of firefighting appliances .....	97
B11.0	SAFETY MANAGEMENT SYSTEM .....	98
B11.1	Domestic Safety Management (DSM) Certificate .....	98
B11.2	Exemptions .....	98
B12.0	DANGEROUS CARGOES .....	99
B12.1	Carriage of dangerous goods.....	99
SECTION C - VESSELS CARRYING 12 PASSENGERS OR LESS.....		100
C1.0	CONSTRUCTION AND STRUCTURAL STRENGTH.....	100
C1.1	General requirements .....	100
C1.2	Structural strength .....	101
C1.3	Decks .....	102
C1.4	Watertight bulkheads.....	103
C1.5	Inflatable and rigid inflatable boats .....	104
C2.0	WEATHERTIGHT INTEGRITY .....	107
C2.1	General .....	107
C2.2	Hatchways and Hatches .....	107
C2.3	Doorways and companionways.....	108
C2.4	Skylights.....	108
C2.5	Portlights and windows .....	109
C2.6	Ventilators and exhausts .....	110
C2.7	Air pipes.....	111
C2.8	Sea inlets and discharges.....	111
C2.9	Materials for valves and associated piping .....	112
C3.0	WATER FREEING ARRANGEMENTS .....	113
C4.0	MACHINERY.....	115
C4.1	General requirements .....	115
C4.2	Diesel engines.....	115

C4.3	Petrol engines.....	115
C4.4	Installation.....	117
C5.5	Securing, ventilation and filling arrangements of petrol tanks .....	118
C5.6	Engine starting and stopping.....	119
C5.7	Portable equipment .....	119
C5.8	Stowage of spare petrol .....	120
C6.0	ELECTRICAL ARRANGEMENTS .....	121
C6.1	General .....	121
C6.2	Systems.....	121
C6.3	Lighting .....	122
C6.4	Batteries .....	123
C6.5	Cables .....	124
C6.6	Hazardous spaces .....	125
C6.7	Lightning protection .....	125
C6.8	Emergency Supplies.....	126
C7.0	STEERING GEAR, RUDDER AND PROPELLER SYSTEMS .....	127
C7.1	Steering.....	127
C7.2	Rudder system.....	127
C7.3	Propeller system.....	128
C8.0	BILGE PUMPING .....	129
C8.1	General system requirements .....	129
C8.2	Vessels carrying 16 or more persons or operating in area categories 0 or 1 .....	129
C8.3	Vessels carrying 15 or fewer persons and operating in area categories 2 to 6.....	130
C8.4	Open boats, inflatable boats and boats with a buoyant collar .....	130
C8.5	Bilge alarms .....	130
C9.0	STABILITY .....	132
C9.1	All vessels.....	132
C9.2	Damage survivability .....	133
C9.3	Intact stability: vessels requiring a stability information booklet (see C9.1.2).....	136
C9.4	Intact stability: vessels complying with simplified stability assessment (see C9.1.3) ..	139
C9.5	Stability and survivability of open boats, inflatable boats, rigid inflatable boats or boats fitted with a buoyant collar.....	142
C9.6	Stability tests .....	142
C9.7	Damage tests - inflatable boats.....	142
C9.8	Swamp test.....	143
C9.9	Person recovery stability test.....	143

C9.10	Stability of vessels fitted with a deck crane or other lifting device.....	143
C9.11	Stability of vessels engaged in towing.....	145
C9.12	Approval and carriage of stability information .....	147
C9.13	A vessel required to have approved damage stability information .....	148
C9.14	Guidance on stability assessment .....	149
C10.0	FREEBOARD AND FREEBOARD MARKING .....	150
C10.1	General .....	150
C10.2	Minimum freeboard .....	150
C10.3	Freeboard mark and loading .....	152
C10.4	Inflatable boats and boats fitted with a buoyant collar .....	153
C11.0	FIRE SAFETY .....	154
C11.1	General .....	154
C11.2	Vessels Operating in Area Categories 0 and 1.....	154
C11.3	Insulation.....	156
C11.4	Cleanliness and pollution prevention.....	156
C11.5	Open flame appliances and gas installations .....	157
C11.6	Furnishing materials .....	158
C11.7	Fire detection .....	158
C11.8	Means of escape.....	158
C12.0	FIRE APPLIANCES .....	160
C12.1	General .....	160
C12.2	Vessels less than 6m in length operating in area category 6 .....	160
C12.3	Vessels up to 8m in length not fitted with a substantial enclosure .....	160
C12.4	Vessel less than 15m in length, and carrying 15 or fewer persons, not covered by section C12.2 or C12.3.....	160
C12.5	Vessels of 15m or more in length, or carrying 16 or more persons.....	161
C12.6	Provision for fire extinguishing in machinery spaces .....	162
C12.7	Informative notes .....	163
C12.3	Cargo Carrying .....	163
C12.4	Vessels fitted with a deck crane or other lifting device .....	164
ANNEX 1 - MANNING MATRIX .....		167
ANNEX 2 - BOATMASTER LICENCE SYLLABUS .....		172
Syllabus Requirements.....		172
ANNEX 3 - BOAT ENGINEER LICENCE SYLLABUS .....		177
Syllabus Requirements.....		177
ANNEX 4 - COMPETENT CREW LICENCE SYLLABUS.....		180



Syllabus Requirements.....	180
ANNEX 5 - ANCILLARY CERTIFICATES .....	183
Safety Certification .....	183
ANNEX 6 - RECOGNISED PROFESSIONAL QUALIFICATIONS FOR BOATMASTERS .....	184
ANNEX 7 - ALTERNATIVE COMPLIANCE STANDARDS FOR RIGID INFLATABLE BOATS WISHING TO OPERATE OUTSIDE THE HOURS OF DAYLIGHT WITHIN AREA CATEGORY 3 .....	185
ANNEX 8 - STABILITY INFORMATION BOOKLET CONTENTS.....	188
ANNEX 9 LIQUID PETROLEUM GAS INSTALLATION FOR DOMESTIC USE.....	193
1. Definition .....	193
2. General Information.....	193
3. Stowage of Gas Cylinders .....	193
4. Cylinders and Attachments .....	194
5. Fittings and Pipework.....	194
6. Appliances .....	195
7. Ventilation .....	195
8. Gas Detection .....	195
9. Emergency Action.....	196
10. Owner/Operator Testing.....	196
ANNEX 10 - FIRE TEST FOR FRP .....	197
1. Heat Source .....	197
2. Specimen .....	197
3. Test Procedure .....	197
ANNEX 11 - IGNITABILITY TEST FOR COMBUSTIBLE MATERIAL.....	198
1. Test Specimens.....	198
2. Conditioning of Test Specimens .....	198
3. Atmosphere for Testing.....	198
4. Testing Procedure.....	198
4.3 Test Procedure .....	199
5 Pass Criteria .....	199

## PREAMBLE

The aim of this Code is to prescribe standards of construction, manning and emergency equipment for small commercial vessels operating from a harbour within the Bailiwick of Guernsey, other than vessels operating solely within the territorial seas of Alderney and Sark. The Code is given legal effect by the [x] Regulations, 2017, which creates criminal offences in respect of breaches of, and non-compliance with, the Code.

The standards in this Code have been developed by the States of Guernsey Harbour Master, in consultation with the appropriate authorities in Sark and Alderney and are directly linked to United Kingdom (UK) requirements. Where this Code does not provide specific requirements to be complied with, it highlights where those requirements may be found.

The builder, owner/operator and master of the vessel, as appropriate, shall take all reasonable measures to ensure that the vessel is constructed, maintained and operated in accordance with the requirements of this Code and is suitable for the purpose intended, having regard to the area the vessel will be operating in.

The Code is subdivided into sections where standards and requirements differ between types of vessel. Section A applies to all vessels, Section B applies only to vessels carrying more than 12 passengers and Section C applies only to vessels carrying 12 passengers or less.

It is important to stress that, whilst all reasonable measures may have been taken to ensure a safe vessel, total safety can never be guaranteed.

Compliance with the Code in no way obviates the need for vessels and Masters to comply with any applicable legislation.

The operation of small commercial vessels outside of Bailiwick of Guernsey waters is not covered by this Code and operators should consult the appropriate administration for further information.

# **1. APPLICATION AND INTERPRETATION**

## **1.1 Application**

### **1.1.1 The Code applies to:**

Vessels operating commercially from a harbour within the Bailiwick of Guernsey, which are less than 24m in loadline length and carrying not more than 250 passengers, other than vessels operating solely within the territorial seas of Alderney and Sark.

### **1.1.2 The Code shall not apply to:**

- i. fishing or pleasure vessels;
- ii. a vessel holding a valid International Passenger Vessel Safety Certificate issued under the provisions of the International Convention on the Safety of Life at Sea, 1974, as amended (SOLAS);
- iii. a boat forming part of a vessel's lifesaving equipment that is used to carry passengers in emergencies, during emergency exercises and as a tender between vessel and shore for not more than 72 hours;
- iv. a vessel of another jurisdiction, whose government has inspection laws approximating those of this Code or through bilateral or multilateral agreement, which has on board a current valid safety certificate, certificate of inspection, or other certificates permitting the carrying of passengers, or cargo in the appropriate sea areas, issued by its Government, unless there are clear grounds for believing that the condition of the vessel or of its equipment does not correspond substantially with the particulars of any of the certificates or is such that the vessel is not fit to proceed to sea without presenting an unreasonable threat to the safety of the vessel or its seafarers and passengers or the environment;
- v. Vessels engaged in pilotage services, as identified by the Harbour Master;
- vi. Vessels owned or chartered by the governments of Guernsey, Alderney or Sark;

- vii. Vessels operating solely within the territorial seas of Sark, where the voyage starts and ends from the island of Sark; and
- viii. Vessels operating solely within the territorial seas of Alderney, where the voyage starts and ends from the island of Alderney.

1.1.3 Unless otherwise specified the Code applies to both new and existing vessels. Those items specified for new vessels may, where appropriate, be applied to existing vessels.

## 1.2 Definitions

“Accident” has the same meaning as in the Merchant Shipping (Accident Reporting and Investigation) (Bailiwick of Guernsey) Regulations 2009,

“Administration” means the States' Trading Supervisory Board,

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

“Areas of Operation” A vessel may be considered for the issue of a Code Compliance Certificate or a Code Compliance Passenger Vessel Certificate allowing it to operate in one of the following areas:

Area Category 6 - to sea, within 3 miles of a nominated departure point(s) named in the certificate and never more than 3 miles from land, in favourable weather and daylight;

Area Category 5 - within 3 miles of land and not more than 3 miles radius from either the point of departure or point of arrival in favourable weather;

Area Category 4 - Up to 20 miles from a safe haven, in favourable weather and in daylight;

Area Category 3 - Up to 20 miles from a safe haven;

Area Category 2 - Up to 60 miles from a safe haven;

Area Category 1 - Up to 150 miles from a safe haven;

Area Category 0 - Unrestricted service,

“Certifying Authority” means one of the organisations authorised by the Administration to undertake survey and certification work,

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

“Commercial vessel” means any vessel (ie boat or vessel) engaged in commercial trade or that carries passengers and/or cargo for hire or reward,

“Control position” means a conning position which is continuously manned whilst the vessel is under way,

“Crew” means a person employed or engaged in any capacity on board a vessel in the business of the vessel,

“Dangerous Goods” are items as defined by the IMO International Dangerous Goods (IMDG) Code,

“Daylight” means between one hour before sunrise and one hour after sunset,

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

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

“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 boat, the distance measured vertically downwards from the lowest point of the gunwale to the waterline,

“Harbour Master” means the States of Guernsey Harbour Master, States of Alderney Harbour Master and Sark Harbour Masters as appointed and in relation to his/her jurisdiction,

“Length” means the length of vessel 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 vessel,

“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,

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

“Marine Guidance Note” (MGN) means a Note 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 Directive on Marine Equipment 96/98/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,

“New vessel” for the purpose of this Code means a vessel in respect of which there does not exist, on the date that this Code comes into force, a valid Code Compliance Certificate or Passenger Vessel Code Compliance Certificate issued by the Administration,

Any vessel may be treated as an “existing vessel” if it has previously been certificated as a Passenger Vessel and it was laid up on a day that falls within the period of five years prior to the date this Code enters into force in respect of which the Harbour Master has issued a determination in writing to the effect that the vessel cannot reasonably be expected to comply with the mandatory safety requirements; and it is made subject to an initial Passenger Vessel

survey under this Code and in respect of which, in consequence of the completion of that survey, a Passenger Certificate was issued not more than five years after the day it was laid up or two years after the date this Code enters into force, whichever is the earlier,

“Open vessel” for the purpose of this Code means a vessel which is:

- not fitted with a watertight deck; or
- is fitted with a watertight deck over part of its length; or
- 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 vessel except:

- a member of the vessel's crew,
- a person on board the vessel 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,
- a child of under one year of age,

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

“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,

“Sea Service” means time spent in the relevant capacity on board a vessel licensed under this Code, engaged on a voyage. For the purposes of sea service, a day shall be considered as being appointed to the vessel for 6 hours or more in every 24 hours, but recognises that the vessel may not be at sea for the entire period and shall include stand-by periods,

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

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

“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. Aluminium is the only common constructional material that may be considered equivalent to steel,

“Surveyor” means any surveyor appointed and approved by the Administration,

“Vessel” includes every description of a vessel used in navigation,

"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 vessel when subjected to a hose test, and

"Workers" include every person employed or engaged in any capacity on board any vessel.



## 1.3 Areas of Operation

- 1.3.1 A vessel may be considered for the issue of a Code Compliance Certificate or a Code Compliance Passenger Vessel Certificate allowing it to operate in one of the following areas:
- i. Area Category 6 - to sea, within 3 miles of a nominated departure point(s) named in the certificate and never more than 3 miles from land, in favourable weather and daylight;
  - ii. Area Category 5 - within 3 miles of land;
  - iii. Area Category 4 - Up to 20 miles from a safe haven, in favourable weather and in daylight;
  - iv. Area Category 3 - Up to 20 miles from a safe haven;
  - v. Area Category 2 - Up to 60 miles from a safe haven;
  - vi. Area Category 1 - Up to 150 miles from a safe haven;
  - vii. Area Category 0 - Unrestricted service.
- 1.3.2 Depending on the nature of the vessel and its use, a vessel may be restricted to less than the above specified limits. Such a restriction should be recorded on the Code Compliance Certificate or Code Compliance Passenger Vessel Certificate for the vessel and should be limited to operations within Area Categories 3, 4, 5 and 6 only.

## SECTION A – ALL VESSELS

The standards and requirements contained within Section A of this Code apply to all vessels.

### A1.0 VESSEL SURVEY AND CERTIFICATION

#### A1.1 Introduction

A certificate confirming compliance with this Code is required by all commercial vessels to which this Code applies.

A vessel carrying 12 or less passengers requires a **Code Compliance Certificate**.

A vessel carrying more than 12 passengers requires a **Code Compliance Passenger Vessel Certificate**.

#### A1.2 Code Compliance Certificates and Code Compliance Passenger Vessel Certificates

A1.2.1 A vessel to which this Code applies shall not be operated without having on board a valid Code Compliance Certificate or Code Compliance Passenger Vessel Certificate, as appropriate, issued by the Harbour Master following –

- i. in the case of a Code Compliance Passenger Vessel Certificate, a satisfactory survey of the vessel by one of the following organisations:
  - a. Maritime and Coastguard Agency (MCA)
  - b. Bureau Veritas (BV)
  - c. DNV GL Group (DNVGL)
  - d. Lloyd's Register of Shipping (Lloyd's EMEA)
  - e. Jersey Maritime Administration (JMA)

and

- ii. in the case of a Code Compliance Certificate, receipt of a valid Small Commercial Vessel Certificate (SCVC) and corresponding Document of Compliance (Form SCV2) relating to that vessel as issued by a recognised Certifying Authority as per section A1.4.

- A1.2.2 Every vessel to which a Code Compliance Certificate or Code Compliance Passenger Vessel Certificate has been issued shall conform to this Code and any additional measures deemed appropriate and reasonable by the Harbour Master throughout the period of validity of the certificate.

*Periods of validity of Certificates*

- A1.2.3 A Code Compliance Passenger Vessel Certificate shall remain valid for the period specified on its face which may not exceed one year. A Code Compliance Certificate shall remain valid for the period specified on its face which may not exceed five years. These periods of validity for all vessels apply from the date of issue (unless revoked by the Harbour Master) provided that, in the case of a Code Compliance Certificate, an owner's declaration is completed annually.

*Code Compliance Certificates – annual owner's declarations*

- A1.2.4 In the case of a vessel which is issued with a Code Compliance Certificate which is valid for more than one year, the day and month of that expiry date of that certificate shall be defined as the vessel's anniversary date. The owner's declaration must be submitted to the Harbour Master during the period of six months extending from three months before to three months after the anniversary date in each year until the renewal date of the certificate. The owner's declaration shall be sufficient to establish that the vessel continues to meet the requirements of the Code.
- A1.2.5 A Code Compliance Certificate which is not endorsed to show the completion of the required owner's declaration is invalid.

*Renewal of Certificates*

- A1.2.6 A Code Compliance Passenger Vessel Certificate may not be renewed without the vessel to which it relates having undergone a successful survey (section A1.2.1 (i.) refers), which shall be conducted up to three months prior to the expiry of the certificate. The survey shall be sufficient to establish that the vessel continues to meet the requirements of the Code. Renewal certificates may be issued for the same periods of validity as original certificates, as set out in section A1.2.3.

- A1.2.7 A Code Compliance Certificate may not be renewed without the vessel to which it relates having undergone a successful SCV2 survey (section A1.2.1 (ii) refers), which shall be conducted up to three months prior to the expiry of the certificate. The survey shall be sufficient to establish that the vessel continues to meet the requirements of the Code. Renewal certificates may be issued for the same periods of validity as original certificates, as set out in section A1.2.3.
- A1.2.8 An application for survey of a vessel being newly constructed or converted shall be submitted to the Harbour Master prior to the start of the construction or conversion.

### **A1.3 Posting of certificates, permits and stability letters**

- A1.3.1 The Code Compliance Certificate or Code Compliance Passenger Vessel Certificate and any stability letters shall be posted under glass or other suitable transparent material, such that all pages are visible, in a conspicuous place on the vessel where observation by passengers is likely. Where posting is impracticable, the certificates shall be kept on board in a weathertight container readily available for presentation to passengers and officials of the flag State or port State when requested.

### **A1.4 Small Commercial Vessel Certificate of Compliance**

- A1.4.1 Any vessel carrying 12 persons or less, in addition to a Code Compliance Certificate, shall also carry a valid Small Commercial vessel Certificate of Compliance, as issued by a recognised Certifying Authority (CA). This is of particular importance if the vessel engages on voyages outside of Bailiwick waters.
- A1.4.2 Recognised CAs are listed below:
- Bureau Veritas (BV)
  - DNV GL Group (DNVGL)
  - Lloyd's Register of Shipping (Lloyd's EMEA)
  - Registro Italiano Navale (RINA)
  - Royal Yachting Association (RYA)
  - Yacht Brokers, Designers & Surveyors Association (YBDSA/YDSA)
  - Marine Engineers Certifying Authority Limited (MECAL)
  - International Institute of Marine Surveying (IIMS)
  - The Jersey Maritime Administration (JMA)

## **A1.5 General survey requirements**

- A1.6.1 Where this Code does not provide specific requirements to be complied with, the relevant United Kingdom approved construction standards and related Instructions to Surveyors should be referred to.

## **A1.6 Initial and renewal surveys**

- A1.6.1 All commercial vessels shall be subject to an initial survey before entry into service. This survey will be undertaken by a surveyor approved by the Administration who will survey the vessel against the requirements of this Code.
- A1.6.2 For vessels carrying more than 12 passengers, provided the surveyor is content that the vessel complies with all relevant requirements of this Code, the surveyor will issue a Declaration of Survey to inform the Administration that the vessel may be issued a Code Compliance Passenger Vessel Certificate.
- A1.6.3 For vessels carrying less than 12 passengers, provided the surveyor is content that the vessel complies with all relevant requirements of this Code, the CA will issue a Small Commercial Vessel Certificate (SCVC) and corresponding Document of Compliance (Form SCV2). This should be provided to the Administration so that a Code Compliance Certificate may be issued.

## **A1.7 Verification of the Safety Management System**

- A1.7.1 The validity of a Code Compliance Passenger Vessel Certificate is subject to satisfactory verification of the Safety Management System as required by the Safety Management Code For Domestic Passenger Vessels In The Bailiwick of Guernsey.
- A1.7.2 At the Survey the surveyor is to be satisfied that the vessel complies with the requirements of this Code.

## **A1.8 Extension of certificates**

- A1.8.1 If a renewal survey has been completed and a new certificate cannot be issued or placed on board the vessel before the expiry date of the existing certificate, the Harbour Master may endorse the existing certificate as valid for a period not exceeding 3 months from the expiry date.

## **A1.9 Inspection of the outside of the vessel's underwater area**

- A1.9.1 For vessels carrying more than 12 passengers, an inspection of the outside of the vessel's underwater area is required at every Renewal Survey. This should be undertaken with the vessel out of the water unless alternative arrangements have been agreed by the Harbour Master.

## **A1.10 Survey of propeller shafts (vessels carrying more than 12 passengers)**

- A1.10.1 For vessels carrying more than 12 passengers, 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.
- A1.10.2 In order to assess whether the propeller shafts shall be removed, the surveyor shall consider:
- i. the date the propeller shaft was last withdrawn;
  - ii. the date the propeller shaft was last replaced or reconditioned;
  - iii. any records of excessive noise/vibration;
  - iv. any indication that the propeller shaft is bent;
  - v. any evidence of the intermediate bearings (if any) between the engine (or gearbox) and the stern tube running hot;
  - vi. any evidence of oil consumption in oil lubricated stern gear systems;
  - vii. any evidence of water in the oil reservoir;
  - viii. any evidence of oil leakage past an internal seal;

- ix. evidence, documented or otherwise, of maintenance work carried out on the stern gear;
- x. any comments by the owner/Master regarding the running condition of the stern gear; and
- xi. wherever possible, prior to slipping, the surveyor shall see the engine run with the stern gear engaged to assist in assessing its running condition.

A1.10.3 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.

## **A1.11 Additional inspections**

A1.11.1 The Harbour Master may require an additional inspection of the vessel to be undertaken following the report of any incident or defect which affects the safety of the vessel or following an accident that has been reported.

A1.11.2 An additional inspection, either general or partial, according to the circumstances, shall be made following an important repair or renewal. The inspection 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 vessel complies with the provisions of the relevant regulations.

## **A1.12 Maintenance of conditions after survey**

A1.12.1 The owner/operator and Master are responsible for ensuring:

- i. that the vessel and its equipment is maintained so as to ensure that the vessel in all respects remains fit to proceed to sea without danger to the vessel or persons on board; and
- ii. that no change is made in the structural arrangements, machinery, equipment and other items covered by the Code, without the approval of the relevant organisation, except by direct replacement.

A1.12.2 If a vessel does not continue to comply with the Code, after being certificated, its certification under this Code may be withdrawn or cancelled.



## **A2.0 SAFETY, LIFE SAVING APPLIANCES AND EQUIPMENT**

### **A2.1 Lifesaving appliances**

A2.1.2 The following lifesaving appliances shall be carried in accordance with the requirements listed below:

- Liferafts
- Lifejackets
- Lifebuoys
- Pyrotechnics - including distress flares, hand flares, smoke signals and line throwing appliances
- Radio Lifesaving Equipment including Search and Rescue Location Devices (eg radar-SART (Search and Rescue Transponder), AIS-SART (Search and Rescue Transmitter) or EPIRB and VHF handsets

Details on specific requirements are contained within this section.

### **A2.2 Liferafts**

A2.2.1 The vessel shall carry liferafts sufficient for all persons on board. Where more than one liferaft is carried, they shall be logically distributed over the vessel, such that, in the event of any one raft being lost or rendered unserviceable, the remaining liferafts can be launched for persons to embark and accommodate the number of persons the vessel is certified to carry.

A2.2.2 Vessels Operating in Area Category 0

- a. should be provided with liferafts of such number and capacity that, in the event of any one liferaft being lost or rendered unserviceable, there is sufficient capacity remaining for all on board; and

The liferafts provided should;

- b. be constructed to SOLAS standard, Wheelmarked or DfT approved, have insulated floor and insulated canopy and be equipped with a "SOLAS A PACK"<sup>1</sup>; and

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<sup>1</sup> SOLAS "A" PACK requirements can be found in MSN 1676 (M+F), Schedule 4, Part 6.

- c. in general, be contained in fibre reinforced plastic (FRP) containers (which may be a suitable container other than a SOLAS container) stowed on the weather deck or in an open space and should be fitted with float free arrangements (hydrostatic release units) so that the liferafts float free, inflate and break free automatically. Other stowage and release mechanisms will be considered when they can be demonstrated, to the satisfaction of the Administration, to provide an equivalent level of safety.

#### A2.2.3 Vessels Operating in Area Category 1

- a. The liferaft requirements apply as they do in Section A2.2.1 except that, the liferaft need not have an insulated floor or insulated canopy where the vessel operates exclusively in waters having a temperature of 10°C or higher. The certification shall clearly show this limitation, or;

liferafts built to the ISO 9650 - Small Craft Inflatable Liferafts, Part 1, Type 1, Group A standard, provided the liferaft(s) are fitted with a boarding ramp; are equipped to the level of "SOLAS A PACK", which may, where necessary, include a "grab bag" to supplement the equipment integral to the liferaft; and are certificated as compliant with Part 1, Group A and Part 3 of ISO 9650 from March 2005 onwards, are acceptable.

Compliance certification issued by one of the EC notified bodies responsible for approval of life saving appliances, described in the Marine Equipment directive ([www.MARED.org](http://www.MARED.org)), will be recognised as full third party verification of compliance.

- b. Where the vessel is certificated to carry fewer than 16 persons, the liferaft requirement may be satisfied by a single liferaft. The liferaft capacity should accommodate at least the total number of persons on board.
- c. Liferafts, in general, should be contained in FRP containers (which may be a suitable container other than a SOLAS container) stowed on the weather deck or in an open space and should be fitted with float free arrangements (hydrostatic release units) so that the liferafts float free, inflate and break free automatically. Other stowage and release mechanisms will be considered when they can be demonstrated, to the satisfaction of the Administration, to provide an equivalent level of safety.

A2.2.4 Vessels Operating in Area Categories 2, 3, 4, 5 and 6;

- a. should be provided with liferaft capacity to accommodate at least the total number of persons on board;
- b. the liferaft(s) provided should be either;
  - i. in accordance with Section A2.2.2(a) except that the liferaft(s) should be equipped with "SOLAS B PACK"<sup>2</sup>; or
  - ii. built to the ISO 9650 - Small Craft Inflatable Liferafts, Part 1, Type 1, Group A standard, provided the liferaft(s) are fitted with a boarding ramp; are equipped to the level of "SOLAS B PACK", which may, where necessary, include a "grab bag" to supplement the equipment integral to the liferaft, and are certificated as compliant with Part 1, Group A and Part 3 of ISO 9650 from March 2005 onwards.

Liferafts should be carried either;

- in approved FRP containers stowed on the weather deck or in an open space, and fitted in a float free arrangement so that the liferafts float free, inflate and break-free automatically; or
- in FRP containers or valise stowed in readily accessible and dedicated weathertight lockers opening directly to the weather deck.

A2.2.5 Vessels operating in Area Category 6 only, may utilise open reversible liferafts, constructed to SOLAS standard, MED approved ("Wheelmarked") or DfT approved. Liferaft(s) should be equipped to a level equivalent to a "DfT E Pack"<sup>3</sup>. This may, where necessary, include a "grab bag" to supplement the equipment integral to the liferaft.

A2.2.6 All liferafts should be serviced at a service station approved by the manufacturer and at the manufacturer's recommended intervals. However, where the liferaft(s) are stored in valises this should be at least annually.<sup>4</sup>

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<sup>2</sup> SOLAS "B" PACK requirements can be found in MSN 1676 (M+F), Schedule 4, Part 6

<sup>3</sup> DfT "E" PACK requirements can be found in MSN 1676 (M+F), Schedule 4, Part 4.

<sup>4</sup> MGN 362 (M+F) provides further guidance on the servicing of inflatable liferafts, inflatable lifejackets and hydrostatic release units.

- A2.2.7 Inflatable liferaft hydrostatic release units<sup>5</sup> (other than the types which have a date limited life and are test fired prior to disposal) should be serviced annually at a service station approved by the manufacturer.
- A2.2.8 To facilitate rapid abandonment in an emergency, where a liferaft “grab bag” is provided, it should be in an accessible position known to all on board. Equipment carried in the “grab bag” does not count towards the equipment the vessel itself must ordinarily carry.

### **A2.3 Liferaft assembly, evacuation, stowage and embarkation arrangements**

- A2.3.1 The practicalities of safe evacuation of the vessel must be considered from the earliest design stage, with particular attention given to the optimum position of liferafts and the ease of both launching and entering the rafts from the launch area. It is appreciated that within the confines of small vessel design the optimum placement from a safety point of view is not always possible, however it should be taken into consideration when finalising the layout with the aim of facilitating timely and efficient evacuation insofar as is possible.
- A2.3.2 The minimum criteria that shall be applied:
- i. Liferafts shall be stowed so that they are float free and that one person may launch the liferaft into the water in an emergency.
  - ii. Suitable embarkation arrangements shall be provided to ensure safe and efficient dry shod evacuation of passengers.
- A2.3.3 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 vessel in its lightest condition, either an evacuation slide or SOLAS type embarkation ladder is 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 vessel in its lightest condition, davit launched liferafts and at least one launching appliance shall be provided on each side of the vessel.

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<sup>5</sup> MGN 343 (M+F) “Hydrostatic Release Units (HRU) - Stowage and Float Free Arrangements for Inflatable Liferafts.

- A2.3.4 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.
- A2.3.5 Assembly points shall be readily identifiable by signage. All routes to the assembly station for liferafts shall be clearly marked.
- A2.3.6 The liferafts shall be in a secure position as to ensure safe launching. Care shall also be given to avoid overboard discharges and the vessel's side in way of a machinery space or other space with a high fire risk unless the side of the vessel is insulated to the A-30 fire protection standard. Lifesaving appliances shall be stowed abaft the collision bulkhead.
- A2.3.7 Handling of liferafts at any one launching station shall not interfere with the handling of liferafts at another launching station.
- A2.3.8 Liferafts and buoyant apparatus shall be so stowed that they can be released safely even under unfavourable conditions of trim and of up to 15 degrees of list either way.
- A2.3.9 Liferafts shall be stowed so they can be released manually. Each liferaft shall automatically inflate on reaching the water with its painter permanently attached to the vessel, 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.

## **A2.4 Lifejackets**

- A2.4.1 There shall be sufficient suitable lifejackets in number for 105% of the passengers and the minimum provision for infants, children and oversized passengers shall be as follows:
  - i. A number of child size lifejackets shall be carried equal to at least 10% of the total number of persons carried or such greater number as may be required to provide a lifejacket for each child.

- ii. In addition, a number of infant size lifejackets shall be carried equal to at least 2.5% of the total number of persons carried or such greater number as may be required to provide a lifejacket for each infant.
- iii. A sufficient number shall be suitable for securing to oversize passengers.

A2.4.2 Lifejackets shall be stored where they are readily accessible 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.

A2.4.3 Lifejackets shall be stowed throughout the passenger accommodation. The distribution of lifejackets around the vessel shall follow approximately the distribution of passengers.

A2.4.4. Lifejackets shall be provided with a MED approved light unless the vessel operates only within daylight hours when lights are not required.

## **A2.5 Lifebuoys**

A2.5.1 At least two of any lifebuoys fitted shall be provided with lifelines and self-activating lights. At least 50% of any additional lifebuoys carried shall be fitted with lights.

## **A2.6 Distress flares and pyrotechnics**

A2.6.1 6 parachute distress flares  
4 hand flares  
2 buoyant smoke signals of 3 minute duration

## **A2.7 Radio lifesaving equipment**

A2.7.1 EPIRB, Search and Rescue Locating Device and Hand Held VHF sets in accordance with Section A3.0.

## **A2.8 Means of recovery of persons from the water**

- A2.8.1 A rescue retrieval system approved by the Administration shall be provided for the retrieval of persons from the water in order to bring a person on board from the water within 15 minutes.
- A2.8.2 A vessel which is accepted as being able to act as its own rescue boat shall demonstrate the practical effectiveness of the retrieval arrangements provided on board by functional tests carried out under controlled safe conditions to the satisfaction of the Administration.
- A2.8.3 When a vessel is manned by the helmsman and one seafarer, the demonstration required above shall include retrieval of the seafarer from the water (the seafarer can be assumed to be conscious).
- A2.8.4 Operators must carry out a risk assessment to determine the means necessary to effect rescue of persons incapable of self-recovery from the water, including, whether or not the requirement for the carriage of a rescue boat may be relaxed.
- A2.8.5 Vessels shall be so designed to enable the safe recovery of persons from the water. Arrangements will be dependent on the individual vessels, but vessels with good manoeuvrability, together with adequate on board 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.
- A2.8.6 The means of recovery of persons from the water must be satisfactorily demonstrated to the surveyor.

## **A2.9 Operational requirements**

- A2.9.1 Posters and signs shall be provided in the vicinity of rescue boats and liferafts illustrating the purpose of the controls and the procedures for launching and manoeuvring the liferaft/rescue boat.
- A2.9.2 Liferafts shall be serviced in accordance with the manufacturer's instructions.

- A2.9.3 Inflatable lifejackets shall be serviced in accordance with the manufacturer's instructions. Where any inflatable lifejackets are used as PPE on a regular basis, they shall be serviced annually. Lifejackets on a two yearly servicing regime shall be inspected annually to the manufacturer's recommendations.
- A2.9.4 Life-saving appliances shall be fitted with retroreflective material.
- A2.9.5 All Lifesaving appliances shall be maintained and be ready for immediate use.
- A2.9.6 All periodic tests and inspections by vessel's and company staff shall be recorded.
- A2.9.7 All crew shall be familiar with the equipment. Drills and training shall be conducted and recorded in accordance with company and statutory requirements.



## **A3.0 COMMUNICATIONS**

### **A3.1 Radio communications equipment compliance**

A3.1.1 Every vessel shall be provided with radio communications equipment complying with the following functional requirements such that while at sea the vessel shall be capable:

- i. of transmitting vessel-to-shore distress alerts by at least two separate and independent means, each using a different radio communication service;
- ii. of receiving shore-to-vessel distress alerts;
- iii. of transmitting and receiving vessel-to-vessel distress alerts;
- iv. of transmitting and receiving search and rescue coordinating communications;
- v. of transmitting and receiving on-scene communications;
- vi. of transmitting and receiving signals for locating;
- vii. of transmitting and receiving maritime safety information;
- viii. of transmitting and receiving general radio communications to and from shore-based radio systems or networks; and
- ix. of transmitting and receiving vessel-to-vessel communications.

### **A3.2 Radio Installation**

A3.2.1 Every radio installation shall:

- i. be so located that no harmful interference of mechanical, electrical or other origin affects its proper use, and so as to ensure electromagnetic compatibility and avoidance of harmful interaction with other equipment and systems;
- ii. be so located as to ensure the greatest possible degree of safety and operational availability;
- iii. be protected against harmful effects of water, extremes of temperature and other adverse environmental conditions;
- iv. be clearly marked with the call sign, the vessel station identity and other codes as applicable for the use of the radio installation.

### **A3.3 Radio equipment**

- A3.3.1 All vessels shall be capable of initiating a distress call/alert by at least two separate and independent means, one of which must be VHF, the second means should not be VHF. The second means may be met by the parachute rocket flares, subject to vessel being in visible range of land. There should be at least two VHF radio sets provided, ie one fixed and one portable.
- A3.3.2 All vessels shall carry as a minimum the radio and emergency communication equipment detailed in sections A3.4, A3.5 and A3.6.

### **A3.4 Distress alerting**

The following distress alerting shall be carried by all vessels unless stated otherwise:

- A3.4.1 1 x Fixed GMDSS VHF radio installation.
- A3.4.2 1 x VHF Channel 70 DSC watch installation which may be incorporated with above. An open vessel may have the “fixed” VHF DSC fitted into a waterproof case at the control position. Any such kit, however, must have a spare battery and a means of charging it, as well as a means of charging the spare battery.
- A3.4.3 6 x Rocket parachute flares.
- A3.4.4 1 x Float-free 406 MHz EPIRB with a 121.5 MHz homing device. The EPIRB should be installed in an easily accessible position where it can be manually released and placed in a liferaft.

### **A3.5 “Last mile” pin-point homing**

- A3.5.1 4 x Hand flares.
- A3.5.2 1 x SART (Radar, AIS or AIS MOB Beacon) or GPS facility incorporated in 406MHz EPIRB.

### **A3.6 Other items**

- A3.6.1 1 x Reserve power supply capable of supplying the fixed VHF installation continuously for a period of at least six hours. This may be via the battery charger where a “fixed” VHF DSC is battery powered.
- A3.6.2 1 x Battery charger capable of fully charging the battery within a period of not more than 16 hours.

### **A3.7 Maintenance requirements**

- A3.7.1 Equipment shall be readily accessible for inspection and on-board maintenance purposes.
- A3.7.2 Adequate information shall be provided to enable the equipment to be properly operated and maintained.
- A3.7.3 EPIRBs shall be annually tested for all aspects of operational efficiency, with special emphasis on checking the emission on operational frequencies, coding and registration. The test may be conducted on board the vessel or at an approved testing station; and subject to maintenance at intervals not exceeding five years, to be performed at an approved shore-based maintenance facility.

### **A3.8 Radio personnel**

- A3.8.1 Every vessel shall carry personnel qualified for distress and safety radio communication purposes to the satisfaction of the Administration.

### **A3.9 Position updating**

- A3.9.1 The Primary VHF equipment carried on board a vessel to which this chapter applies which is capable of automatically including the vessel's position in the distress alert shall be automatically provided with this information from an internal or external Electronic Position Fixing System receiver, if either is installed.

### **A3.10 Watches**

- A3.10.1 Every vessel, while at sea, shall maintain a continuous watch on VHF DSC channel 70 and Channel 16.

### **A3.11 Portable communication**

- A3.11.1 A portable VHF shall be provided for use in the event of abandoning the vessel. These are to be portable, waterproof and shall be stowed in a protected and easily accessible position.

## **A4.0 EMERGENCY INFORMATION FOR PASSENGERS**

### **A4.1 Safety broadcasts**

- A4.1.1 A member of the crew must be able to broadcast a safety or emergency message that can be heard by all persons on board the vessel.

### **A4.2 Public address systems**

- A4.2.1 Vessels are to be provided with a public address system, operable from at least one point that can be heard by all persons on board.
- A4.2.2 In vessels 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 a public address system.
- A4.2.3 In vessels carrying not more than 12 passengers, verbal communication with persons on board is acceptable to the Administration.
- A4.2.4 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 vessels with loud hailers.

### **A4.3 System requirements**

- A4.3.1 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 vessel being abandoned. This information shall be given either prior to or immediately on leaving the berth.
- A4.3.2 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.

- A4.3.3 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 loud hailers.

#### **A4.4 Passenger emergency instructions notices**

- A4.4.1 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 vessel 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.

#### **A4.5 Passenger emergency instructions announcement**

- A4.5.1 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; and
  - How to use the life-saving appliances.
- A4.5.2 Announcements shall be made in a clear and simple manner bearing in mind that in some services a significant number of foreign tourists may be carried. Announcements shall be brief in order to convey sufficient information to assist all concerned in the event of an emergency.
- A4.5.3 Announcements shall be prefaced by a special signal followed by a request for everyone's attention.

## **A5.0 NAVIGATION**

### **A5.1 Introduction**

This chapter is to provide suitable equipment and shipboard facilities and arrangements and to have in place navigational operational procedures in accordance with International (implemented by national regulation) and any local requirements to navigate the vessel safely in the intended area of operation.

### **A5.2 Navigational equipment**

A5.2.1 Some of the navigational equipment specified in section A5.2.2 need not be carried in circumstances where it can be demonstrated by risk assessment to the satisfaction of the Administration that the vessel can be safely operated and navigated without that equipment. The risk assessment shall be appraised by the Harbour Master in such a case and, if agreed, an exemption from the specific requirement may be issued. This concession has been included to recognise that the risks of specific vessel operations may vary significantly and it may not be appropriate to fit all specified equipment on certain vessels operating a limited or restricted operation. The exemption is to be specific to the intended area of operation and will be withdrawn if the vessel is relocated.

A5.2.2 A vessel shall be provided with the following:

- i. Searchlight - Every vessel shall carry an efficient searchlight suitable for man-overboard and other search and rescue operations.
- ii. Navigation Lights and Shapes - Complying with the Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996.
- iii. Signalling Lamp - Every vessel 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 vessel's power supply. The signalling lamp may be the searchlight required by (i).
- iv. Whistle (Horn) - Every vessel shall carry a whistle (Horn) 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.

- v. Appropriate navigational charts and publications for the area of operation.
- vi. A properly adjusted magnetic compass or other means, independent of any power supply, to determine the vessel's heading. 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. This 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.
- vii. 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 vessel's position by automatic means.
- viii. A speed measuring log or equivalent means of measuring speed and distance. The receiver in (vii) may incorporate this requirement.
- ix. A rudder angle indicator.
- x. A 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.
- xi. A radar reflector, or other means to enable detection by vessels navigating by radar.
- xii. 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 vessel other than a steel vessel, with a hand bearing compass.
- xiii. For vessels carrying 12 or more passengers, a second radar to provide redundancy should the primary radar fail whilst on passage.



A5.2.3 Vessels shall be fitted with an approved automatic identification system (AIS). The AIS shall be Class B and shall:

- i. Provide automatically to appropriately equipped shore stations, other vessels and aircraft, information including the vessel's identity, type, position, course and speed.
- ii. Receive automatically such information from similarly fitted vessel's monitor and track vessels.
- iii. Exchange data with shore-based facilities.

### **A5.3 Navigation lights, shapes and sound signals**

A5.3.1 Vessels shall comply with the requirements of the International Regulations for Preventing Collisions At Sea, 1972, as amended, (the COLREGS) implemented by The Merchant Shipping (Bailiwick of Guernsey) Law, 2002.

A5.3.2 All navigation lights shall be provided with main and emergency power supply.

### **A5.4 Dedicated lookout**

A5.4.1 Any dedicated lookout shall –

- i. have the sole duty, while the vessel is underway, of maintaining a lookout;
- ii. be positioned outside the passenger spaces, and
- iii. be instructed by the Master to keep a continuous lookout, and in particular over any or all additional areas where the helmsman cannot see.

A5.4.2 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.

## **A5.5 Cameras, mirrors and other aids**

- A5.5.1 Aids such as cameras and mirrors may be provided to assist the helmsman in close-quarters manoeuvring, such as berthing, and to fill blind zones eg within the permitted two vessels' lengths/200m of the vessel, but they must not be relied upon to assist in the situational awareness or replace all-round visibility of the helmsman.

## **A6.0 ACCESS AND MOORING**

### **A6.1 Means of access**

- A6.1.1 It is the responsibility of the owner/operator and Master to ensure a safe means of access between the vessel and any quay, pontoon or similar structure or another vessel, alongside to which the vessel is secured, and in particular:
- i. that any equipment is placed in position promptly after the vessel has been secured and remains in position while the vessel is so secured;
  - ii. that access equipment is:
    - properly rigged, secured, deployed, and is safe to use;
    - adjusted from time to time as to maintain safety of access;
    - are adequately illuminated along with immediate approaches; and
    - of good construction, of sound material, of adequate strength for the purposes for which it is used, free from patent defect and properly maintained (includes any safety net).
- A6.1.2 It is the responsibility of the owner/operator and Master to provide safe access to and from the shore if the vessel is not secured alongside a fixed berth but access between shore and vessel is necessary.
- A6.1.3 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 vessel, safety nets should be rigged where appropriate.
- A6.1.4 Where accommodation ladders are fitted they should comply with the specifications in The Code of Safe Working Practices for Merchant Seamen.

## **A7.0 GENERAL SAFETY**

### **A7.1 Safe movement of passengers and crew**

- A7.1.1 To aid the safe movement of passengers and crew, vessels shall;
- i. Be fitted with slip resistant external decks and stairways.
  - ii. Be fitted with an adequate number of handrails and handholds.
  - iii. Minimise potential tripping hazards.
- A7.1.2 Access areas, walkways and working areas shall be adequately lit.

### **A7.2 First aid kits**

- A7.2.1 Vessels must comply with the UK Merchant Shipping and Fishing Vessels (Medical Stores) Regulations 1995 (SI 1995/1802), as amended. MSN 1768 (M+F) provides further guidance.

### **A7.3 Carriage Of The Code Of Safe Working Practices For Merchant Seamen (COSWP)**

- A7.3.1 Workers on every vessel shall have an awareness of the COSWP.

## **A8.0 MANNING**

### **A8.1 Minimum manning levels**

- A8.1.1 A vessel shall be safely manned.
- A8.1.2 The manning matrix at Annex 1 should be used to determine minimum manning levels in all cases. However, the operator shall consider the specific operation of the vessel and provide additional manning as appropriate.
- A8.1.3 Factors which may merit the need for additional crew might include, but are not limited to, vessels carrying a rescue boat or ro-ro operations. In considering the need for additional crew, attention shall be made to the ability to safely navigate the vessel and deal with emergency situations effectively.
- A8.1.4 The owner/operator shall submit the proposed crew numbers to the Harbour Master. If acceptable to the Harbour Master 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.
- A8.1.5 The number of crew may vary according to the number of passengers carried at any one time.
- A8.1.6 Where persons are engaged on board, in addition to the operational crews, eg 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.

### **A8.2 Single handed operations (12 & Under only)**

- A8.2.1 The Administration does not recommend single handed operations. Single handed operations are prohibited on vessels carrying more than 12 passengers.
- A8.2.2 In all cases where single handed operations take place the owner/managing agent and the skipper should be satisfied that it is safe to do so.

- A8.2.3 A single handed operation is considered to be taking place when either;
- i. there is only one person on board the vessel; or
  - ii. there is a skipper on board with passengers, and there is no one else on board capable of assisting the skipper in an emergency.
- A8.2.4 Where a watch system is necessary to maintain the safe navigation of the vessel due to extended periods at sea, single handed operations are not permitted.
- A8.2.5 Vessels operating under this Code, other than those engaged in towing or in any other business which involves the transfer of personnel at sea, may be operated single handed providing that the person operating the vessel complies fully with the minimum requirements for a skipper (appropriately qualified for the operating area) and the following conditions:
- the area of operation is restricted to Area Category 3, 4, 5 or 6 in conditions of favourable weather and subject to favourable official weather forecasts for the area throughout the period of operation; and
- i. the duration of the voyage should not exceed 8 hours; and
  - ii. the vessel is not operated single handed in conditions of restricted visibility; and
  - iii. an acceptable lifejacket is worn at all times by the skipper; and
  - iv. no overside working takes place whilst the vessel is being operated single handed; and
  - v. details of the time and point of departure, voyage plan and the Expected Time of Arrival (ETA) of every single handed voyage are logged with either Guernsey Port Control and/or Guernsey Coastguard and that person is notified of the safe arrival on completion of each voyage; and
  - vi. communication should be made with a person ashore or with a vessel in company at regular agreed intervals; and
  - vii. On all open sports boats, inflatable craft and RIBs, inflatable boats, boats fitted with a buoyant collar and open boats that achieve planning speed including tenders, when fitted with remote throttle controls, engine kill-cords should be fitted and used at all times during navigation. A spare kill cord is to be carried on board.
  - viii. Skippers are most strongly recommended to wear personal locator beacons.
- A8.2.6 In some cases, because of the size and arrangement of the vessel, the Certifying Authority may deem the vessel not to be suitable for single handed operations.

### **A8.3 Hours of work provisions**

A8.3.1 The hours of work provisions of this Code shall:

- i. apply to all seafarers (including Masters) employed or engaged in any capacity on board a vessel to which this Code is applicable;
- ii. provide for a minimum of 10 hours rest in any 24 hour period and 77 hours in any 7-day period and 4 weeks annual paid leave;
- iii. provide for 2 periods of unbroken rest, 1 of which shall be for at least 6 hours.
- iv. require records of hours of rest to be maintained; and
- v. provide for inspection and enforcement by the Administration.

### **A8.4 Records of hours of work**

A8.4.1 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 sufficient information to allow the surveyor, or an employment tribunal, to investigate any claim of a breach of the regulations.

### **A8.5 Alcohol and drugs**

A8.5.1 The Merchant Shipping (Commercial Vessels) (Safety and Manning) (Bailiwick of Guernsey) Regulations 2017 states that any professional Master or crew member commits an offence if his/her ability to carry out his/her duties is impaired because of drink or drugs.

A8.5.2 The prescribed limits and enforcement details can be found in the regulations.

A8.5.3 Operators are encouraged to implement an appropriate drink/drugs policy through the Safety Management System.

## A8.6 Emergency duties

- A8.6.1 An Emergency Duties Poster shall be posted by the Master if more than 2 crew are carried.
- A8.6.2 The poster shall set forth the special duties and duty station of each seafarer for various emergencies. The duties shall, as far as possible, be consistent with the regular work of the individual. The duties shall include at least the following and any other duties necessary for the proper handling of a particular emergency:
- i. the closing of hatches, fire dampers, watertight doors, air vents, scuppers, and valves;
  - ii. for intake and discharge lines that penetrate the hull, the stopping of fans and ventilating systems, and the operating of all safety equipment;
  - iii. the preparing and launching of survival craft and rescue boats;
  - iv. the extinguishing of fire;
  - v. the mustering of passengers including the following:
    - warning the passengers;
    - assembling the passengers and directing them to their appointed stations; and
    - keeping order in the passageways and stairways and generally controlling the movement of the passengers.
- A8.6.3 The poster shall be posted at the operating station and in a conspicuous location in each seafarer accommodation space.



## **A9.0 LICENSING OF BOATMASTERS, ENGINEERS AND CREW**

### **A9.1 Master**

- A9.1.1 A commercial vessel shall carry in command a person who is qualified as follows:
- i. he or she is the holder of a licence issued by the Harbour Master stating that he or she is qualified to have command of such a vessel;
  - ii. the licence is in force and is of a grade appropriate in respect to the waters in which the vessel is being navigated, the size of the vessel and the number of passengers carried;
  - iii. the vessel is in an area specified in the licence as one in which a vessel may be navigated under the command of the holder;
  - iv. he or she is the holder of the additional qualifications identified in Annexes 5 & 6; and
  - v. he or she is the holder of a local knowledge endorsement (LKE) or equivalent, appropriate to the area of operation, if required by the relevant Harbour Master.

### **A9.2 Engineers**

- A9.2.1 A commercial vessel carrying more than 12 passengers and fitted with main propulsion machinery units of up to 750 kW per unit, shall be required to carry as Engineer a person who is qualified as follows:
- i. he or she is the holder of a licence issued by the Harbour Master stating that he or she is qualified to be in charge of the main and auxiliary machinery of such a vessel;
  - ii. the licence is in force and is of a grade appropriate in respect to the waters in which the vessel is being navigated;
  - iii. the vessel is in an area specified in the licence as one in which a vessel may be operated under the charge of the holder; and
  - iv. he or she is the holder of the additional qualifications identified in Annex 5.
- A9.2.2 A commercial vessel fitted with main propulsion machinery units each exceeding more than 750 kW will be required to be certified in accordance with STCW.

### **A9.3 Competent crew**

- A9.3.1 A commercial vessel may be required by Anne 1 to carry crew in addition to a Boatmaster and/or Boat Engineer. Any crew shall be competent and shall hold the qualifications identified in Annex 5.
- A9.3.2 A commercial vessel required to carry competent crew shall carry one or more persons, as required by the Harbour Master, who is qualified as follows:
- i. be sixteen years of age or over;
  - ii. he or she is the holder of a licence issued by the Harbour Master stating that he or she is trained in accordance with the syllabus at Annex 4; and
  - iii. he or she is the holder of the qualifications identified in Annex 5.
- A9.3.3 The Harbour Master may delegate the examination process for Competent Crew to the Boatmaster.

### **A9.4 Licence issue, standards and conditions**

- A9.4.1 The Harbour Master may issue licences as Boatmaster, Boat Engineer or Competent Crew, as appropriate to persons who meet the requirements of this Code.
- A9.4.2 An application for a licence under this Code shall be made in such form as the Administration may from time to time specify.
- A9.4.3 Notwithstanding that an applicant for a licence under this regulation complies with the standards and satisfies the conditions specified by the Harbour Master, the Harbour Master shall not issue such a licence to the applicant unless he is satisfied, having regard to all the relevant circumstances, that the applicant is a fit person to be the holder of such a licence.

- A9.4.4 The holder of a Boatmaster Licence or a Boat Engineer licence is permitted to serve as Competent Crew with his/her existing licence, provided that the holder is only serving in one capacity at any time.

## **A9.5 Grades and vessel restrictions of Boatmaster licences**

- A9.5.1 A licence as a Master issued under this Code shall bear the title “Boatmaster Licence” and shall be of one of the following grades, which shall be stated in the licence:

Boatmaster Licence, Grade 1

Boatmaster Licence, Grade 2

- A9.5.2 Table A9.5.2 details the grade requirements for Boatmaster licences in respect of the size and type of vessel. The holder of a Grade 1 licence will be licensed to operate all sizes and types of vessel.

Table A9.5.2

<b>Size and type of vessel</b>	<b>Minimum Grade of Licence</b>
≤ 12 passengers, < 15m length	2
≤ 12 passengers, 15 to 24m length	1
> 12 passengers, 15 to 24m length	1

- A9.5.3 Where a vessel, the Master of which is required to hold a licence, has sails as its principal means of propulsion, a sail endorsement is required. The requirement for a sail endorsement is a practical test on boat handling as detailed in Annex 2, Section C.
- A9.5.4 A Boatmaster licence of any grade shall be subject to such restriction as the Harbour Master may determine as to the area or areas in which a vessel may be navigated under the command of the holder; and every such restriction shall be stated in the licence.

## **A9.6 Requirements for obtaining a Boatmaster licence**

A9.6.1 In order to obtain a Boatmaster Licence Grade 2 an applicant shall:

- i. be eighteen years of age or over;
- ii. have submitted a valid medical certificate in compliance with section A9.15;
- iii. have completed a course of ten hours of practical instruction under a licensed Boatmaster in sail or power vessels of appropriate size;
- iv. produce documentary evidence of having obtained the additional qualifications stated in Annexes 5 & 6;
- v. have passed an examination for Boatmaster Grade 2.

A9.6.2 In order to obtain a Boatmaster Licence Grade 1 an applicant shall:

- i. be twenty one years of age;
- ii. have completed a course of ten hours of practical instruction under a licensed operator in sail or power vessels of appropriate size;
- iii. have completed seagoing service of not less than 3 months;
- iv. have submitted a valid medical certificate in compliance with section A9.15;
- v. produce documentary evidence of having obtained the additional qualifications stated in Annexes 5 & 6;
- vi. have passed the examination for Boatmaster Grade 1.

## **A9.7 Practical instruction**

A9.7.1 Where an applicant is required to have had practical instruction this will be construed as his or her having enough experience to demonstrate proper boat handling skills in whatever craft or vessel the experience may have been given. However, it should be borne in mind that the prospective licence holder needs to demonstrate adequate knowledge of the methods of controlling, handling and directing vessels in emergencies, on the vessels, which he will be entitled to command.

## **A9.8 Examination for Boatmaster licences**

- A9.8.1 A Boatmaster examination for Grade 2 consists of two parts. The first is an oral examination in which applicants will be tested on their knowledge of safety, navigation, rule of the road and seamanship subjects and also how they respond to certain emergency situations. The second part consists of a practical test carried out on the size of vessel for which the applicant needs a licence. This test requires applicants to demonstrate their ability to handle the vessel in various circumstances.
- A9.8.2 The Boatmaster examination for Grade 1 consists of three parts. The first part of which is an oral examination in which applicants will be tested on their knowledge of safety, rule of the road and seamanship subjects and also how they respond to certain emergency situations. The second part consists of a practical test in chartwork and the use of electronic aids to navigation. The third part is a practical test carried out on a vessel of 15m to 24m in length. This test requires applicants to demonstrate their ability to handle the vessel in various circumstances.
- A9.8.3 An applicant passing only one part of the examination will be allowed to retain the pass in that part for a period of six months subject to the applicant being the holder of a valid medical fitness certificate when re-sitting the other part.
- A9.8.4 Details of the syllabus for each grade are contained in Annex 2.

## **A9.9 Vessel restrictions of Boat Engineer licences**

- A9.9.1 A licence as Engineer issued under this Code shall bear the title “Boat Engineer Licence”.
- A9.9.2 A Boat Engineer licence shall be subject to such restriction as the Administration may determine as to the area or areas in which a vessel may be operated under the charge of the holder; and every such restriction shall be stated in the licence.

## **A9.10 Requirements for obtaining a Boat Engineer licence**

- A9.10.1 In order to obtain a Boat Engineer Licence an applicant shall:
- i. be sixteen years or over;
  - ii. have submitted a valid medical certificate in compliance with section A9.15;
  - iii. produce documentary evidence of having obtained the additional qualifications stated in Annex 5; and
  - iv. have passed the examination for Boat Engineer.

## **A9.11 Approved course**

- A9.11.1 An approved course is a course approved by the Administration, which is listed in Annex 5. A Certificate of Attendance shall be given by the course organisers to persons satisfactorily completing the course.
- A9.11.2 The courses listed in Annex 5 shall be completed prior to a licence being issued. It is strongly recommended that refresher training is undertaken to ensure levels of competence and knowledge are maintained.
- A9.11.3 Persons who are able to demonstrate to the satisfaction of the Administration that they have appropriate engineering experience may be granted an exemption from the requirement to attend an approved course.

## **A9.12 Examination for Boat Engineer licences**

- A9.12.1 A Boat Engineer examination consists of an oral examination in which applicants shall be tested on their knowledge of marine engines, propulsion systems, auxiliary machinery systems outboard engines, safe working practices and how the candidate responds to certain emergency situations.
- A9.12.2 The examination for a Boat Engineer Licence shall be based on the syllabus given in Annex 3 at a level appropriate to the vessel.

- A9.12.3 A candidate who is unsuccessful in the examination shall resit the entire examination.
- A9.12.4 Administrations may utilise written examination or computer based assessment to assist with assessment in oral examinations.

### **A9.13 Existing licences**

- A9.13.1 On the application of the holder of an existing valid licence to operate commercial vessels, the Harbour Master shall issue to that person a licence under this Section; and the licence shall be of the grade which is appropriate in respect of:
- i. the type of vessel when being navigated/operated by the licence holder;
  - ii. the size and type of vessel which in the period of 12 months before the coming into force of the Code was navigated/operated by the holder of the existing licence.
- A9.13.2 A holder of an existing valid licence to operate commercial vessels who is issued a licence under this Code will be required to hold the additional qualifications identified in Annex 5 and Annex 6 within two years of this Code coming into effect, and have appropriate knowledge of the Code, to the satisfaction of the Harbour Master.

A Certificate of Sea Service will be issued by the Harbour Master on the date this Code comes into force to all existing valid licence holders detailing historical experience and sea service.

### **A9.14 Period of validity and renewal of licence**

- A9.14.1 Licences shall be subject to re-validation every 5 years. Re-validation will be subject to the holder having proof that he or she has had at least 15 days service in the previous 12 months in vessels for which the licence is valid during that time. Revalidation is also subject to the submission of a medical certificate in accordance with section A9.15.1.

A9.14.2 Applicants unable to provide proof of service shall satisfy the Administration of continued professional competence through test or re-examination.

A9.14.3 A licence shall only remain valid so long as the person to whom it is issued holds a valid medical fitness certificate.

#### **A9.15 Medical fitness certificate**

A9.15.1 A medical fitness certificate in accordance with the requirements of the Administration shall be submitted with the initial application for a licence and for the re-validation of a licence. The Administration accepts medical fitness certificates ML5 and ENG1.

#### **A9.16 Record and surrender of licences**

A9.16.1 The Administration shall make and, during the period of the licence, retain a copy of every licence issued under this Section.

A9.16.2 A record of:

- i. every licence issued under this Section; and
- ii. every suspension, cancellation or alteration of and any other matter affecting such a licence;

shall be kept, in such manner as the Administration may require, by the Administration or by such other person as the Administration may direct.



## **SECTION B – VESSELS CARRYING MORE THAN 12 PASSENGERS**

The standards and requirements contained within Section B of this Code apply to vessels carrying more than 12 passengers.

### **B1.0 MEANS OF ESCAPE**

#### **B1.1 Introduction**

- B1.1.1 All persons on board should be able to escape from any space which may be occupied under normal operational circumstances readily in an emergency.

#### **B1.2 Means of escape – all vessels**

- B1.2.1 Every vessel shall provide means of escape from all crew and passenger spaces. These escapes may be in the form of doorways, stairways, ladder ways and, in fully enclosed vessels, emergency windows. 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 small spaces normally occupied by crew only this may be reduced to one.
- B1.2.2 In fully enclosed spaces, there shall be at least two escapes on each side of the vessel on each deck.
- B1.2.3 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.
- B1.2.4 Where escapes are in the form of doors or windows they shall be capable of being opened from either side.
- B1.2.5 All escapes shall be clearly marked.
- B1.2.6 Main and emergency lighting shall be provided at each escape point.

### **B1.3 Minimum widths**

- B1.3.1 The minimum clear width of doorways, corridors and stairways shall be 750mm. This shall be increased by 10mm for every person where the maximum number of passengers the compartment is designed to accommodate exceeds 75 (eg for 75-150 passengers there shall be two escapes, each with a clear width of no less than 750mm, but for 200 passengers there shall be a minimum of two escapes providing an aggregate of 2000mm of clear width for escape from the space).

### **B1.4 Stairways**

- B1.4.1 Stairways shall, where practicable, be arranged in the fore and aft direction and at an inclination of not less than 45° to the vertical.

### **B1.5 Windows**

- B1.5.1 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 600mm by 600mm.

### **B1.6 Doors**

- B1.6.1 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 normally used for passengers shall be clearly indicated with one or more signs marked "EMERGENCY ESCAPE DOOR" or "EMERGENCY ESCAPE WINDOW" as appropriate. Signs shall be:
- B1.6.1.1 Inherently luminous or electrically powered by an internal power source which is maintained and charged in normal service.
  - B1.6.1.2 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 vessel is in service. Signs shall be composed of white or light coloured letters on a green background.

## **B1.7 Public rooms**

- B1.7.1 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.

## **B1.8 Other**

- B1.8.1 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 vessel 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.

## **B2.0 SEARCH AND RESCUE (SAR) REQUIREMENTS**

### **B2.1 SAR Plan**

- B2.1.1 The aim of the SAR co-operation plan is to ensure that, in the event of an emergency, vessels' staff, the company response team ashore and SAR services are able to work efficiently together to respond to an emergency.
- B2.1.2 All vessels carrying more than 12 passengers shall carry an approved up to date plan for co-operation with relevant SAR services for the vessel's area of operation. Brief details of the passenger vessel, the company and the SAR services must be exchanged and maintained ready for use and shall include direct contact details.
- B2.1.3 The SAR plan shall be of the format detailed in MSN 1783 – "Arrangements for the carriage of agreed search and rescue co-operation plans aboard UK passenger vessels".
- B2.1.4 Copies of the approved SAR co-operation plan shall be held on board, in the company office and at Guernsey Coastguard.

### **B2.2 SAR Exercises**

- B2.2.1 Exercising the SAR Plan regularly tests the plan's effectiveness.
- B2.2.2 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 vessels' staff.
- B2.2.3 For companies which operate two or more vessels, 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.

- B2.2.4 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.
- B2.2.5 Records of such exercises and names of participants shall be recorded in the Safety Management System.

## **B3.0 ACCESS FOR PERSONS WITH REDUCED MOBILITY**

Vessels should be designed and operated to accommodate the needs of persons of reduced mobility (PRM) as far as is practicable. The guidance in this section is not mandatory for non-steel vessels but should be observed and implemented unless there are specific aspects of the vessel which prevent doing so.

Persons of reduced mobility 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.

### **B3.1 General**

- B3.1.1 Vessels should be constructed and equipped in such a way that a person with reduced mobility can embark, disembark and move around the vessel easily and safely. Guidance can be found in MGN 306 - Designing and Operating Smaller Passenger Vessels: Guidance on meeting the needs of passengers with reduced mobility.
- B3.1.2 Passenger areas should meet the needs of persons with reduced mobility as far as practicable.
- B3.1.3 In order to help set passenger expectations and to reduce boarding problems, operators of passenger vessels operating on UK categorised waters are strongly recommended to:
  - i. Include limitations, procedures, processes and training requirements within their Domestic Safety Management (DSM) Systems for the assessment, boarding, welfare and safety of PRMs travelling on their vessels.
  - ii. 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.

## **B3.2 Ramps**

- B3.2.1 Ramps should be fitted where door sills are of such a height as to reduce the access capabilities for persons of reduced mobility.
- B3.2.2 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.
- B3.2.3 It is recommended to paint or 'hatch' a ramp in order that it is easily recognizable as a change in floor level height.
- B3.2.4 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.
- B3.2.5 The ramp surface should be slip resistant (especially when wet).
- B3.2.6 There should be a colour contrast between a landing and a ramp.
- B3.2.7 Staff assistance should also be available, when required.

## **B3.3 Handrails**

- B3.3.1 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.
- B3.3.2 Handrails should:
  - i. be round, with a diameter of 40-45mm and no sharp bends;
  - ii. have a minimum clearance of 60 to 75mm between handrails and any adjacent surface;
  - iii. 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;
  - iv. return to the wall, floor or post in a smooth curve at the end. The method used should be consistent throughout the vessel; and
  - v. be provided on each side of steps and ramps. A central double handrail is desirable on wide staircases (over 2000mm).

## B3.4 Doors on vessels

- B3.4.1 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 disabled toilet facilities for a passenger to alert the crew if they require assistance.
- B3.4.2 Door openings to public spaces should be wide enough for wheelchairs to pass unimpeded with a free opening of at least 800mm.
- B3.4.3 Special consideration should be made to the size and operable force of opening/closing doors, especially for the use of persons with reduced mobility.

## B3.5 Recommended space allowances

- B3.5.1 The table below outlines the basic minimum requirements against comparable best practice guidance.

	<b>Minimum Legal Requirement</b>	<b>Best Practice Recommendations</b>
Corridor	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.	<ul style="list-style-type: none"><li>- Minimum width of 1200mm:</li><li>- A clear width 1800mm to allow wheelchairs to pass each other.</li><li>- Minimum clear head room of 1980mm from the deck.</li></ul>
Stairway	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.	<ul style="list-style-type: none"><li>- Minimum width between handrails should be 1200mm.</li><li>- Resting areas should be a minimum of 1200mm by 1200mm, although 1800mm by 1800mm is preferred.</li><li>- Maximum rise of stairway flights be no more than that of height between decks.</li></ul>
Seating	No specific requirement for seating for persons with reduced mobility.	<ul style="list-style-type: none"><li>- At least 4% of the seating in each lounge should have a design and an 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.</li></ul>



	<b>Minimum Legal Requirement</b>	<b>Best Practice Recommendations</b>
Space for wheelchair	No minimum requirements	<ul style="list-style-type: none"> <li>- 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.</li> <li>- At least one of these spaces should be provided. It should be possible to place the wheelchair safely in position.</li> </ul>
Toilets	No dimensional requirements.	<ul style="list-style-type: none"> <li>- Toilet doorways should be a minimum width of 925mm</li> <li>- 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</li> </ul>
Doorways	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.	<ul style="list-style-type: none"> <li>- Doorways should have a clear minimum opening width of 800mm.</li> </ul>

## B4.0 WATERTIGHT INTEGRITY

The standards contained in this Code include an equivalent standard to UK Merchant Shipping (Load Line) Regulations.

### B4.1 Watertight subdivision

- B4.1.1 Every subdivided vessel 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 B8 of this Code.
- B4.1.2 Every other portion of the internal structure which affects the efficiency of the subdivision or buoyancy of the vessel shall be watertight, and shall be of a design which will maintain the integrity of the subdivision.
- B4.1.3 The stern gland of every subdivided vessel shall be situated in a watertight shaft tunnel or other watertight space.
- B4.1.4 Regardless of whether a ship is subdivided or not, every vessel 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.

### B4.2 Weatherdeck

- B4.2.1 On a subdivided vessel the bulkhead deck or a deck above the bulkhead deck shall be weathertight. All openings in an exposed weathertight deck shall have coamings of a height specified in the table 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 weather deck of water under all weather conditions. Spaces below weather deck or gunwale level in vessels or spaces not provided with a weathertight deck shall be considered to be liable to swamping in survivability calculations.

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

- B4.2.2 Doors giving access to enclosed superstructure, or to spaces below decks shall be weathertight, permanently fixed, of equivalent strength to the bulkhead in which it is fitted. The door shall be operable from both sides and be outward opening.
- B4.2.3 Hatch covers shall be of equivalent strength to the deck and weathertight.
- B4.2.4 Coamings may be omitted when hatchways are secured and not used on voyage. In that case there shall be a visual indication or an indication on the bridge of a closed and secured hatchway.
- B4.2.5 Ventilators serving spaces within the vessel shall be provided with coamings of adequate strength with weathertight closing devices and shall have a height of at least 760mm above the freeboard deck and 450mm above superstructure decks. This height may be reduced to the satisfaction of the surveyor, but shall not be less than respectively 380mm and 230mm.
- B4.2.6 Air pipes, which shall be fitted to prevent air locks or high pressure in tanks, extending above the deck shall be of adequate strength and be provided with weathertight closing devices and shall have a height of at least 760mm above the freeboard deck and 450mm above superstructure decks. This height may be reduced to the satisfaction of the surveyor, but shall not be less than respectively 380mm and 230mm.
- B4.2.7 Skylights shall be of adequate strength and if they comprise openings they shall be located at least 450mm above the deck. Such openings shall be capable of being closed by permanently attached weathertight covers. Skylights may be in the form of opening side scuttles with deadlights.
- B4.2.8 Scuppers, sea inlets and discharges shall meet the classification society standards appropriate to the size and service of the vessel.
- B4.2.9 The vessel shall have sufficient and effective freeing ports of appropriate dimensions, with the lower edge as near as the deck as possible, to the satisfaction of the classification society. Openings of large freeing port areas shall be adequately protected with bars, to the satisfaction of the Certifying Authority. The minimum freeing port area (A) on each side of the vessel shall be 4% of the bulwark area.

### **B4.3 Partial subdivision above the bulkhead deck**

- B4.3.1 On subdivided vessels 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 vessel 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.

### **B4.4 Marking of valves, doors and mechanisms**

- B4.4.1 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 vessel to indicate, as necessary, the procedures for operating them, the purpose of the controls and any precautions to be observed.

### **B4.5 Windows**

- B4.5.1 Windows that form part of the weathertight integrity of a vessel shall be in accordance with Classification Society Rules, and shall be toughened safety glass.
- B4.5.2 Windows that do not form part of the weathertight integrity of a vessel, but provide protection and comfort to persons on board shall be of the toughened safety glass type, such that it is unlikely to cause injury if it shatters.

### **B4.6 Routine inspections for watertight integrity**

- B4.6.1 All deadlights, watertight doors, valves and closing mechanisms of scuppers shall be opened and closed at intervals of not more than seven days.

- B4.6.2 All closing appliances and devices relating to the damage control or watertight integrity for protection of the vessel shall be inspected by a person appointed by the Master for that purpose before the vessel at intervals of not more than seven days, or if the vessel has been out of service for more than seven days, before it proceeds on any voyage.
- B4.6.3 A record of any inspection shall be kept as part of the Safety Management System.

## **B5.0 MACHINERY**

The standards included in this section specify minimum requirements the Classification Society standards must satisfy, they are not an alternative to full compliance with Classification Society requirements.

### **B5.1 Machinery requirements**

- B5.1.1 Passenger vessels operating under this Code shall have Twin Screw propulsion, or provide an acceptable alternative measure of propulsion in the event of any single point of failure.
- B5.1.2 The machinery, boilers and other pressure vessels, associated piping systems and fittings shall comply with the rules of a Classification Society, 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.
- B5.1.3 Any propulsion systems not adequately covered by the Classification Society rules such as electronic, solar or sail-powered vessels shall be considered by the MCA on a case by case basis.

### **B5.2 Control of propulsion machinery**

- B5.2.1 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.
- B5.2.2 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.

- B5.2.3 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.
- B5.2.4 It shall be possible for all machinery essential for the safe operation of the vessel to be controlled from a local position, even in the event of failure in any part of the automatic or remote control systems.
- B5.2.5 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.
- B5.2.6 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.

### **B5.3 Means of manoeuvring and going astern**

- B5.3.1 Every vessel shall have sufficient power for manoeuvring and going astern to secure proper control of the vessel in all normal circumstances.
- B5.3.2 The ability of the machinery to reverse the direction of thrust in sufficient time so as to bring the vessel to rest from maximum ahead service speed shall be demonstrated and recorded. The vessel shall be capable of stopping within a safe distance, to be determined by the Surveyor, with due regard to the operating environment.
- B5.3.3 The stopping distance and manoeuvrability is not quantified as this will be dependent on the type of vessel, speed and operating environment. The vessel 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.
- B5.3.4 The effective operation of any supplementary means of stopping or manoeuvring the vessel shall be demonstrated and recorded.

## **B5.4     Steering gear**

- B5.4.1     Every vessel shall be provided with an efficient main and auxiliary steering gear. 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.
- B5.4.2     The main steering system and if power operated, the auxiliary steering system, shall be operable from the navigating bridge.
- B5.4.3     A suitable means of alarm, such as an audible or visual alarm shall be provided on the navigating bridge in case of failure of electrical supply to the control system.
- B5.4.4     A suitable means of alarm for hydraulic operated steering gear, such as an audible or visual low-level alarm of hydraulic fluid, shall be provided on the navigating bridge.
- B5.4.5     A suitable short circuit protection and an overload alarm for steering gear electric and electro-hydraulic circuits and motors shall be provided on the navigating bridge.
- B5.4.6     A means of communication shall be provided between the navigating bridge and the steering gear compartment or alternative steering position.
- B5.4.7     The indication of the angular position of the rudder(s) or direction of thrust shall be provided on the navigating bridge.
- B5.4.8     The steering gear compartment shall be readily accessible and, as far as practicable, separated from machinery spaces.
- B5.4.9     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 vessel to be steered at navigable speed.
- B5.4.10    The majority of vessels operating under this Code will have simple steering gear arrangements. The Alarms noted above in B5.4.3 and B5.4.5 may be dispensed with, when in the case of electrically powered systems or pumps the steering will continue to function manually, and, in the case of a hydraulic system the manual backup/emergency steering is capable of being quickly brought into action and the hydraulic oil reservoir can be rapidly recharged.



## **B5.5 Means for stopping machinery, shutting off flammable oil supply pipes, pumps and closing of openings**

- B5.5.1 Means shall be provided –
- i. for stopping ventilating fans serving machinery and accommodation spaces;
  - ii. for closing all doorways, ventilators, and other openings to such spaces; and
  - iii. to permit the release of smoke from machinery spaces.
- B5.5.2 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.
- B5.5.3 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.
- B5.5.4 The means of stopping machinery, shutting off power pipes, pumps, electrical supplies and closing of openings, for other types of propulsion shall be considered, on a case by case basis, to the satisfaction of the administration.

## **B5.6 Fuel and associated pipework**

- B5.6.1 Flash point of fuel
- i. Any oil fuel used in boilers or machinery shall normally have a flash point of not less than 60°C (closed test). Other fuels, including gas, and hydrogen shall be in accordance with class rules and to the satisfaction of the administration.
- B5.6.2 Oil fuel pipes
- i. 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.

- ii. 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.
- iii. 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.

#### B5.6.3 Flexible fuel pipes

- i. 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.
- ii. 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 B10 then this requirement can be relaxed but flexible pipework shall at least comply with ISO 7840.
- iii. Documentary evidence shall be provided to show the pipework complies with the relevant standards.
- iv. 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.
- v. Flexible fuel pipework shall be renewed according to the pipe manufacturer's instructions. Records of the most recent pipe renewal shall be kept on board and ashore, where practicable.

#### B5.6.4 High pressure fuel pipes

- i. Flexible pipes are not acceptable for use in high pressure fuel injection systems.
- ii. 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 130kW 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.
- iii. 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.
- iv. If an engine under 130kW 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, eg electric motors, switches, etc.
- v. 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.

## **B6 ELECTRICAL ARRANGEMENT**

The standards included in this section specify minimum requirements the Classification Society standards must satisfy, they are not an alternative to full compliance with Classification Society requirements.

### **B6.1 Electrical requirements**

- B6.1.1 The electrical equipment and installations (including any electrical means of propulsion) shall be such that the vessel and all persons on board are protected against electrical hazards.
- B6.1.2 The electrical equipment and installations shall be maintained to ensure the vessel is in an operational and habitable condition.
- B6.1.3 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 vessel 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.

### **B6.2 Emergency power**

- B6.2.1 Additionally, emergency power shall be provided to supply the following where required by this Code:
  - i. navigation lights;
  - ii. audible warning devices;
  - iii. emergency lighting;
  - iv. fixed VHF installations;
  - v. alarm and public address systems;
  - vi. searchlights;
  - vii. fire alarm system;
  - viii. other safety equipment such as automatic pressurised sprinkler systems or fire pumps (unless supplied by mechanical power);
  - ix. bilge pumping systems (unless supplied by mechanical power);
  - x. electronically powered signage where fitted;
  - xi. survival craft launching system, where appropriate;
  - xii. alternative means of starting propulsion engine(s);
  - xiii. steering; and
  - xiv. Transmitting Magnetic Heading Device ("fluxgate compass"), where fitted.
- B6.2.2 The following are admissible for use as an emergency power source:
  - i. 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
- ii. 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.
- iii. to enable the crew to be able to undertake (i.) or (ii.) above, emergency battery lighting shall be provided in way of the emergency means of power supply described. The Emergency lighting may be powered by alternative and/or self-contained sources of energy (eg supplementary lighting).
- iv. Emergency means of power provided in accordance with (i.) or (ii.) above shall be capable of powering emergency lighting for at least 180 minutes and all other items listed in B6.2.1 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.

B6.2.3 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 60 minute standard, 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 vessels and as high as possible in open vessels.

B6.2.4 For the following rooms and locations, emergency lighting shall be provided:

- i. locations where life-saving equipment is stored and where such equipment is normally prepared for use;
- ii. escape routes, access for passengers, including gangways, entrances and exits, connecting corridors, lifts and accommodation areas companionways, cabin areas and accommodation areas;
- iii. markings on the escape routes and emergency exits;
- iv. in other areas intended for use by persons with reduced mobility;
- v. operation rooms, engine rooms, steering equipment rooms and their exits;
- vi. wheelhouse;

- vii. spaces containing the emergency power supply source other than battery lockers;
- viii. points at which extinguishers and fire extinguishing equipment controls are located; and
- ix. 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.

#### B6.2.5 Catamaran Emergency Source of Electrical Power

**B6.2.5.1** Rationale: The requirements of section B6.2.3, 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.

**B6.2.5.2** This requirement can be considered to be fulfilled on a catamaran vessel with twin electrical generators, one in each hull, provided that –

- i. The vessel is decked and subdivided;
- ii. The machinery spaces containing each generator have a longitudinal bulkhead between so that the hulls are separate spaces;
- iii. They are to be enclosed by A class divisions insulated to A30 standard or equivalent;
- iv. Divisions and bulkheads surrounding these machinery spaces are to be watertight;
- v. 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 B4.2, to ensure safe access to the generator after damage on the opposite side; and
- vi. The emergency switchboard shall be located in a position not susceptible to flooding when the vessel is damaged.

## **B7.0 Bilge Pumping**

The standards included in this section specify minimum requirements the Classification Society standards must satisfy, they are not an alternative to full compliance with Classification Society requirements.

The purpose of this section is to provide a means to pump out any water leaking into the vessel 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.

### **B7.1 General**

- B7.1.1 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), used only for stability purposes and where lowest point of tank is above bilge wells/highest level bilge level may be drained by weighted lever cocks, fitted with non-return devices, and which are normally closed.
- B7.1.2 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.
- B7.1.3 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.
- B7.1.4 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Provision shall be made to prevent any deep tank having bilge and ballast connections being inadvertently flooded from the sea when containing cargo, or being discharged through a bilge pump when containing water ballast.

## **B7.2 Fixed bilge pumping requirements**

- B7.2.1 All vessels shall be provided with at least two fixed and independently powered pumps, one capable of being supplied by the emergency source of power. 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.
- B7.2.2 One bilge pump may be the fire pump as required by Section B10.2.1

## **B7.3 Bilge valves**

- B7.3.1 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 vessel 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 vessel's bulkhead deck.
- B7.3.2 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.

## **B7.4 Requirements for bilge pumps and bilge suctions**

- B7.4.1 Every bilge pump provided shall be self-priming.
- B7.4.2 Each bilge pump shall be of a capacity of not less than the fire pump to ensure the vessel is capable of discharging firefighting water of at least the rate of input in a fire scenario.
- B7.4.3 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 vessel or space. Direct suctions in a machinery space shall be of a diameter not less than that required for the bilge main.



- B7.4.4 All fixed bilge suctions shall be fitted with readily accessible strainers so that they may be regularly checked and cleaned.

## **B7.5 Arrangement of bilge pipes**

- B7.5.1 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 firefighting 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.
- B7.5.2 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.

## **B7.6 Precautions against flooding through bilge pipes**

- B7.6.1 The bilge pumping systems shall be so arranged as to prevent external water passing into any part of the vessel. 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.
- B7.6.2 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 vessel than one-fifth of the breadth of the vessel (such a distance being measured at right angles to the centre line of the vessel 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.

## **B7.7 Bilge alarms**

- B7.7.1 A bilge alarm shall be fitted;
- i. in any compartment containing propulsion machinery; and
  - ii. in any other compartment likely to accumulate bilge water.

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.

## **B7.8     Alternative means of compliance for small vessels**

- B7.8.1**     Where the surveyor considers the fitting of a bilge main is not practical, the requirements of B7.1 to B7.6 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.
- B7.8.2**     This does not relieve such vessels of the requirement for at least two means of draining every compartment. The alternative means may be by provision of two fixed pumps or portable engine driven or, one or more submersible type electric pumps with flexible discharge lines, capable of being operated from both main and emergency power via a wandering lead.

## B8.0 INTACT AND DAMAGE STABILITY CRITERIA

### B8.1 Intact Stability (Directive requirements PART B-1)

- B8.1.1 Vessels shall comply with the relevant provisions for passenger vessels of the International Code on Intact Stability, 2008 (2008 IS Code; IMO Resolution MSC.267 (85)), part A, as well as part B, chapter 3 and 8. If the vessel is sailing in conditions where ice accretion may occur, part B of the IS Code 2008, chapter 6 shall apply. All references in this section refer to the above Code.
- B8.1.2 All new vessels, and any existing vessels that have not previously been inclined, should be inclined as detailed in B8.4.1.
- B8.1.3 Where any alterations are made to a vessel so as to affect materially the stability information supplied to the Master, amended stability information shall be provided. If necessary the vessel shall be re-inclined. Where substantial activity related equipment is carried, for example diving equipment, it should be included in the deadweight or cargo. In addition to the above the requirements of B8.5.1 or B8.5.2 (as appropriate) should be complied with.
- B8.1.4 In cases where a vessel's characteristics render compliance with certain provisions of the 2008 IS Code impracticable, alternative requirements shall be in place to the satisfaction of the Administration. The alternative requirements shall be indicated on the certificate and have to be agreed by the Administration before entering service.
- B8.1.5 Notwithstanding the provisions of paragraph B8.1.1:
- Where, for certain vessels, the requirement contained in paragraph 2.2.3 of part A of the International Code on Intact Stability, 2008 (2008 IS Code; IMO Resolution MSC.267 (85)) is impracticable, the Administration may accept the alternative criteria of Section 4.1 of MSC/Circ.1281 Explanatory Notes to the Intact Stability Code 2008.
  - For the calculation of the weather criterion, the wind pressure may be taken according to the following table:

h (m)	1	2	3	4	5	6 and 6+
P(Pa)	316	386	429	460	485	504

Where:

P = pressure to wind to be determined by linear interpolation between the values given; and

$h$  = the vertical distance from the centre of the projected lateral area of the vessel located above the waterline to that waterline (m).

## **B8.2 Subdivision and Damage Stability (Directive requirement PART B-2)**

### **B8.2.1 Subdivision**

Every vessel shall be subdivided by bulkheads, which shall be watertight up to the bulkhead deck, into watertight compartments the maximum length of which shall be calculated according to the specific requirements below.

Vessels shall be fitted with a collision bulkhead complying with the following:

- i. The distance from the forward perpendicular shall be equal to or more than 5% and equal to or less than  $3\text{m} + 5\%$  of the length ( $L$ ) of the vessel;
- ii. The collision bulkhead shall be watertight up to the bulkhead deck and on vessels having a long forward superstructure (ie extending beyond the collision bulkhead) it shall be extended at least weather tight up to the next deck above the bulkhead deck;
- iii. Steps or recesses are only permitted within the length limits prescribed in a of the IMO Code referenced above;
- iv. The number of penetrations by pipes through the collision bulkhead shall be kept to a minimum. Such pipes shall be fitted with valves installed on the front side of the bulkhead that shall be operable from above the bulkhead deck;
- v. Other penetrations in the part below the bulkhead deck are not allowed.

Vessels shall be further fitted with watertight bulkheads such that when any one compartment - that is limited by such bulkheads - is flooded, the margin line of the vessel will not be immersed.

### **B8.2.2 Stability**

The stability of the vessel:

- i. in the final condition when any single compartment is flooded - and after equalisation where provided - shall comply with paragraph II-1/B/8.2.3 - 8.2.5 of the Directive; and
- ii. If it is considered that the stability in intermediate stages may be insufficient, further investigation shall be required. In that case the intermediate stages of flooding of any single

compartment shall comply with paragraph II-1/B/8.2.6 of the Directive

Vessels where asymmetrical flooding will occur shall comply with paragraph II-1/B/8.5 of the Directive.

The final condition of the vessel after damage and, in the case of unsymmetrical flooding, after equalisation measures have been taken, shall comply with paragraph II-1/B/8.6 of the Directive.

For the purpose of making damage stability calculations:

- i. The vessel shall be assumed to be in the worst service condition as regards stability which is likely to be experienced having regard to the intended service of the vessel. The volume and surface permeability's shall comply with article II-1/B-3/10.3 of the directive
- ii. The assumed extent of damage shall be as follows:
  - a. longitudinal extent: 10% of the length of the vessel;
  - b. transverse extent: From the vessel's side to the centreline without limit,
  - c. including any centreline bulkhead; and
  - d. vertical extent: from the base line upwards without limit;
  - e. if any damage of lesser extent than that indicated in a., b., c. would result in a more severe condition regarding heel or loss of metacentric height, such damage shall be assumed in the calculations.

B8.2.3 Ro-Ro vessels shall also meet the requirements of Articles 6, 8 and 9 of Directive 2003/25/EC implementing the Stockholm Agreement.

B8.2.4 Damage Stability of Multi-hulled Vessels

- i. forward damage on catamarans shall be considered to extend to the collision bulkhead of both hulls. On trimarans forward damage shall be considered to extend to the forward compartment of centre hull alone, and also of the centre hull and of one side hull together;
- ii. grounding damage on catamarans shall be considered to flood any one pair of compartments in each hull simultaneously. On trimarans it shall be considered to include any one compartment of the centre hull, and also of the adjacent compartment in one side hull;
- iii. When considering transverse damage, 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. Trimarans should be considered to have damaged wing and centre compartments.

### **B8.3 Stability of simple vessels**

**B8.3.1** Undecked vessels and those with a single deck, operating with up to 60 passengers and up to 63 persons on board in total, in daylight and summer only, need not be subdivided in accordance with Section B8.2 if they are provided with sufficient buoyancy to remain afloat and stable after flooding of any one space. The sufficiency of stability will be demonstrated by compliance with the following requirements:

- i. The vessel shall be capable of remaining afloat at equilibrium with a minimum freeboard anywhere in the length of 76mm on a decked vessel (or 76mm below the gunwale on vessels 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.
- ii. During intermediate stages of flooding, and at final equilibrium, the maximum righting lever shall be at least 0.05m within a range of 0 – 25° and the range of positive righting levers shall be at least 7°.
- iii. The determination of this requirement shall be by calculation where:
  - a. calculations shall be made with all non-floodable tanks in either 95% full 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 vessel 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 vessel 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 assumed not to move.
  - e. the volume of the vessel contributing to buoyancy shall include all structure and fixed equipment which is non-permeable in nature and the solid portions of permeable items.
  - f. 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.

- B8.3.2 In addition to the requirements above a vessel which is assessed as an open vessel 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 vessel is not vulnerable to swamping.

## **B8.4 Stability information**

- B8.4.1 In order to establish where the centre of gravity is for every vessel, an inclining test or hull form analysis will be required and the elements of the vessel's stability determined to demonstrate compliance with the requirements of B8.1 and B8.2. 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.
- B8.4.2 Notwithstanding this requirement, if the inclining test is considered to be impractical, such a test may be replaced by a lightweight survey to the satisfaction of the Administration. This should be for reasons defined in the IMO HSC Code, Section 2.7.2, and subject to the checks therein.
- B8.4.3 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 vessel. All vessels shall keep a written record of stability information on board.

## **B8.5 Subsequent stability verifications**

- B8.5.1 Lightship Survey Verification
- i. In each period of five years every vessel 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 Vessel Code Compliance Certificate or from a previous inclining or lightship survey, whichever date is earliest.
  - iii. The vessel shall be re-inclined whenever, in comparison with the vessel'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% of the vessel'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 vessel may be extended for a period of not more than one year if, on the production of relevant information about the vessel, it can be shown that the lightship survey or test is not necessary at the required interval.
- B8.5.2 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.
- B8.5.3 Where elements of a vessel's stability have been found to have changed following any inclining or lightship survey or test carried out in accordance with the requirements of this Code, the Master shall be supplied with amended approved stability information.
- B8.5.4 Where any alterations are made to a vessel so as materially to affect the stability information supplied to the master amended stability information shall be provided and the vessel shall be re-inclined.
- B8.5.5 The stability information provided pursuant to paragraphs B8.5.3-B8.5.4 shall be furnished in the form of a book (the stability information book) which shall be kept on board the vessel at all times in the custody of the Master. The information shall include particulars appropriate to the vessel and shall be in a form acceptable to the Certifying Authority.
- B8.5.6 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 a surveyor approved by the Administration.



## **B9.0 FREEBOARD AND FREEBOARD MARKING**

The vessel shall have and maintain sufficient freeboard in relation to its size and intended operation.

### **B9.1 Draught marks**

- B9.1.1 Every vessel shall have a scale of draughts marked clearly at the bow and stern in accordance with UK SI 1993 No. 3138 Schedule 3.6. The accuracy of the draught marks shall be witnessed and confirmed by the MCA, Classification Society or Certifying Authority.

### **B9.2 Freeboard Marking**

- B9.2.1 Every vessel shall be marked on each side of the vessel at amidships with its assigned freeboard in accordance with the requirements of UK SI 1998 No.2241 Part III.

### **B9.3 Assigning of freeboard**

- B9.3.1 For subdivided vessels the assigned freeboard shall be the freeboard of the deepest approved loading condition recorded in the stability information booklet and at least 380mm for vessels of 12m length or less to 760mm for vessels of 24m length and the value obtained by interpolation for lengths between 12 and 24m.
- B9.3.2 For vessels complying with the damage stability requirements of section B9.3.1 the assigned freeboard shall be the freeboard in the undamaged condition for the vessel as evaluated in the analysis, and at least 380mm for ships of 6m length or less to 760mm for vessels of 18m length and the value obtained by interpolation for lengths between 6 and 18 m.
- B9.3.3 Notwithstanding the above in no case shall the assigned freeboard be less than the load line freeboard required by UK SI 1998 No.2241.

### **B9.4 General compliance**

- B9.4.1 A vessel shall not proceed, or attempt to proceed, on any voyage unless it is marked with the appropriate marks.

B9.4.2 A vessel shall not be so loaded that –

- i. if the ship is in salt water and has no list the appropriate load line on each side of the vessel is submerged; or
- ii. in any other case, the appropriate load line on each side of the vessel would be submerged if the vessel were in salt water and had no list.

B9.4.3 A vessel shall not proceed to sea when it is in contravention of paragraph B9.4.2.

## **B9.5 Sounding arrangements**

B9.5.1 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.

## **B10.0 FIRE SAFETY**

### **B10.1 High risk areas**

- B10.1.1 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 vessel.
- B10.1.2 High risk boundaries shall be so constructed as to be capable of preventing the passage of flame to the end of the first half-hour of the standard fire test;
- i. They shall have an insulation value such that the average temperature of the unexposed side to the fire will not rise more than 140°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 180°C above the original temperature, to the end of the first half-hour of the standard fire test provided the material concerned is capable of withstanding that temperature without affecting the structural integrity of the vessel.
- B10.1.3 Machinery spaces shall be able to be rapidly closed down to contain a fire, before extinguishing agent 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 firefighting on board vessels to which this Code applies.

### **B10.2 Fixed firefighting arrangements**

- B10.2.1 Fire Pumps
- i. The vessel must be provided with at least two fixed and independently powered fire pumps, one being supplied from an independent or emergency source of power which shall not be located in the same space as the other pump.
  - ii. One of these pumps may be driven from the main engine and be used for other purposes except the pumping of machinery space bilges.
- B10.2.2 The fire pumps shall have a capacity of at least 2/3 that of the bilge pump and produce a minimum pressure of 0.2N/mm<sup>2</sup>

B10.2.3 The pumps shall have a volume flow rate not less than the quantity obtained from the following formula:

Quantity of water in cubic metres per hour =  $25d^2$  where:

$$d = 1 \cdot 0.066 \sqrt{L \cdot B \cdot D}$$

$d$  is taken to the nearest 0.25

where:

L = the length of vessel measured in metres

B = the greatest moulded breadth measured in metres

D = the moulded depth measured to the bulkhead deck at amidships measured in metres

B10.2.4 Every centrifugal pump which is connected to the fire main shall be fitted with a non-return discharge valve.

B10.2.5 At least one pump shall be operable by remote starting from the navigating bridge or position.

B10.2.6 Fire Main and Hydrants

- i. The fire main and hydrants shall be so positioned to ensure at least one jet of water can be delivered to any part of the vessel accessible to the crew using hoses of maximum length 10m. Vessels of over 12m length shall have at least two hydrants
- ii. The fire main shall have no connections other than those necessary for firefighting and washing down.
- iii. The fire hydrants shall be so placed that the fire hoses may be easily coupled to them.
- iv. At least one hose must be provided for every hydrant fitted.
- v. 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.
- vi. The arrangements of pipes and hydrants shall be such as to avoid the possibility of freezing.
- vii. Materials readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected.

B10.2.7 Fire hoses and nozzles

- i. Fire hoses shall be of suitable length and diameter to satisfy the requirements of B10.2.6.
- ii. 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.

- iii. Each hose shall be provided with jet/spray nozzles incorporating a shut-off facility of size 12, 16 or 19mm.
- iv. Each hose shall be made of non-perishable material.

**B10.2.8 Drainage of fire extinguishing water from enclosed spaces or wells in open boats.**

- i. Passenger and crew spaces shall be fitted with drainage arrangements such that firefighting water is cleared from the space no less quickly than the rate at which it may be input by the firefighting system in order to avoid the accumulation of water and associated free surfaces.
- ii. Such drainage mechanisms shall be so arranged as to ensure effective drainage, taking account of possible heel or trim of the vessel 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.
- iii. Regardless of the route of discharge of water from the vessel, 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.
- iv. Freeing ports, drains and pump suctions shall be kept free of obstructions and be suitably protected to avoid their blockage during operation. Regular inspection shall be carried out to ensure that they are not blocked.

### **B10.3 Portable fire extinguishers**

**B10.3.1 Every vessel shall be provided with at least four portable extinguishers of suitable capacity including:**

- i. At least one portable fire extinguisher in each of the crew and passenger spaces above the bulkhead deck.
- ii. At least two portable fire extinguishers in each of the crew and passenger spaces below the bulkhead deck.
- iii. The portable extinguishers required by (i.) and (ii.) shall be so arranged such that a portable extinguisher is available for use within a distance of 10m from any location and as close to the entrances to spaces as practicable.

- B10.3.2 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.
- B10.3.3 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.
- B10.3.4 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.
- B10.3.5 Portable fire extinguishers shall be of the capacities shown in the following table.

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

- B10.3.6 Portable fire extinguishers shall be suitably sized to enable ease of handling.
- B10.3.7 Additionally an approved portable fire extinguisher suitable for fighting liquid fires (Class B) shall be provided within any manned machinery space.
- B10.3.8 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".

## **B10.4 Firefighting systems for machinery spaces, other than those of Category A, containing Internal Combustion Machinery**

B10.4.1 All machinery spaces containing Internal Combustion Machinery shall be provided with a fixed fire extinguishing system, which may be a water, gas or dry aerosol system approved by 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.

i. Vessels of 12m and under

Where such machinery spaces consist of machinery covered by a boxed housing this may comprise of an extinguisher (of a suitable size and type for the space being protected with a total amount of gas at least equal to 40% of the volume of the space) permanently connected and arranged to discharge into that space. The arrangements shall be to the satisfaction of the surveyor. All other arrangements shall comply with (ii.)

ii. Vessels Over 12m

A fixed firefighting system complying with the MED shall be provided.

B10.4.2 Where a gas system is fitted to meet the requirement of B10.4.1 or B10.5.1, 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.

## **B10.5 Firefighting systems for machinery spaces of Category A**

B10.5.1 Category A machinery spaces shall be provided with at least one of the following type approved fixed fire-extinguishing systems which complies with Fire Safety Systems Code:

- i. a fixed pressure water-spraying system;
- ii. a fixed gas fire extinguishing system;
- iii. a high expansion foam system;
- iv. a dry aerosol system.

B10.5.2 In addition to the requirements of paragraph B10.5.1, any Category A machinery space containing internal combustion type machinery, vessels shall carry not less than two portable fire extinguishers suitable for extinguishing oil fires.

## **B10.6 Fire detection in machinery spaces**

- B10.6.1 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.
- B10.6.2 Accommodation spaces including corridors, stairways and escape routes, which cannot be overviewed from the bridge, shall be fitted with a fixed fire detection and alarm system installed and arranged to detect the presence of fire in such spaces.
- B10.6.3 On vessels made of combustible materials all spaces containing sources of ignition shall be fitted with a fixed fire detection and alarm system installed and arranged to detect the presence of fire in such spaces.
- B10.6.4 The alarms shall sound in the space or spaces concerned and shall at the control position be capable of distinguishing between machinery spaces, the galley and other accommodation spaces.

## **B10.7 Fire protection of machinery spaces**

- B10.7.1 Machinery spaces containing internal combustion machinery, oil fired boilers or oil fuel units shall be enclosed by "A" Class divisions insulated to A-30 standard or equivalent. Such spaces shall be gas tight. The boundary may be relaxed to A-0 standard steel boundary or equivalent if the other side of the boundary is a void space, open deck space not measured for passengers or used for cargo, or the side of the vessel (except in way of LSA launching or embarkation positions).
- B10.7.2 Machinery spaces other than those in B10.7.1 shall be enclosed by an A-0 standard steel boundary or equivalent.

## **B10.8 Fire protection of passenger and crew accommodation**

- B10.8.1 In all enclosed accommodation the bulkheads, linings, ceilings and their associated grounds shall be constructed of non-combustible materials and their exposed surfaces shall have low flame spread.
- B10.8.2 Passenger sleeping accommodation shall be fitted with an automatic pressurised water sprinkler fixed firefighting system.



## **B10.9 Fire safety for galleys and cooking facilities**

### **B10.9.1 General**

- i. Vessels may be provided with pantries equipped with facilities to prepare and serve hot food and drinks such as -
  - a. kettles, microwaves, toasters and hotplates each with a maximum power which does not exceed 5kW;
  - b. electrically heated cooking appliances and hot plates for keeping food warm each with a maximum power of 2kW and a surface temperature not above 150°C;
  - c. coffee machines, dish washers and water boilers with no exposed hot surfaces regardless of their power.
- ii. Any electrical cooking or heating appliances with a power exceeding 5kW or liquefied petroleum gas (LPG) installations must be enclosed within a galley and the requirements of section B10.9.3 will apply.
- iii. Any LPG installations shall also comply with the requirements of Annex 8.
- v. Vessels with cooking facilities on an open deck such as pig roast or barbeque facilities should follow the additional guidance in MGN 406.

### **B10.9.2 Deep-fat cooking equipment**

- i. Deep fat cooking facilities are not permitted on any vessel operating under this Code.

### **B10.9.3 Fire protection of galleys**

- i. Galleys containing only LPG and/or low powered electrical appliances shall be enclosed by an A-0 standard steel boundary or equivalent, with self-closing steel doors. Galleys fitted with equipment of more than 5kW shall be fitted with an A-30 standard boundary. Any serving hatches must be fitted with steel shutters.
- ii. Galleys shall not be sited adjacent to the main escape route as required by Section B1.0 of this Code.
- iii. In addition to fire extinguishers specified, a readily accessible fire blanket is to be provided in the galley.

## **B10.10 Availability of firefighting appliances**

- B10.10.1 All moveable fire appliances shall be stowed where they will be readily accessible from the spaces in which they are intended to be used. Fire appliances shall have inherently luminous signs identifying locations.

## **B11.0 SAFETY MANAGEMENT SYSTEM**

### **B11.1 Domestic Safety Management (DSM) Certificate**

- B11.1.1 A vessel to which this Code applies carrying more than 12 passengers, shall not be operated without having on board a valid Domestic Vessel Safety Management Certificate (DSMC) as required by the Safety Management Code for Domestic Passenger Vessels in the Bailiwick of Guernsey following a satisfactory inspection.
- B11.1.2 The initial audit, to assess compliance with the Safety Management Code, shall be carried out before issue of the Code Compliance Passenger Vessel Certificate. On satisfactory completion of this audit, a DSMC for each vessel, shall be issued. The period of validity of this certificate is subject to a mid-term audit.
- B11.1.3 A mid- term audit, when the vessel is in service, shall be carried out between 3 and 6 months after the issue of the Passenger Vessel Code Compliance Certificate, to assess whether the safety management system is functioning effectively. If successful, the DSMC shall be endorsed to this effect and its period of validity shall become the same as that of the Code Compliance Passenger Vessel Certificate.
- B11.1.4 Where the in service/mid-term audit is unsuccessful, enforcement procedures shall be followed to ensure that deficiencies are rectified.
- B11.1.5 The on board audits will be carried out when the vessel is in service and will be according to an agreed schedule depending upon the number of vessels operated by the company.

### **B11.2 Exemptions**

- B11.2.1 Exemptions to these arrangements shall be considered on a case by case basis by the Administration.

## **B12.0 DANGEROUS CARGOES**

### **B12.1 Carriage of dangerous goods**

- B12.1.1 Every vessel carrying more than 12 passengers shall not carry dangerous goods.
- B12.1.2 Any vessels carrying 12 or less passengers may be permitted to carry dangerous goods.
- B12.1.3 These requirements apply to all carriage of dangerous goods, including activity related equipment, materials for commercial use, etc as well as the transport of cargoes.
- B12.1.4 Vessel stores, which are dangerous goods but carried for use during the voyage are exempt from the requirements of this Section, but should be appropriately used and stowed.
- B12.1.5 Dangerous goods are only to be carried on deck.
- B12.1.6 The packing, stowage and segregation requirements of the International Maritime Dangerous Goods (IMDG) Code should apply.
- B12.1.7 The scupper and drainage arrangements are to be directed overboard with no connections to internal spaces.
- B12.1.8 When packaged dangerous goods are carried, details of the emergency firefighting equipment and First Aid medical procedures should be provided on board, with additional equipment if required under the IMDG Code, to ensure that if an emergency occurs, it can be dealt with effectively.
- B12.1.9 When carrying packaged dangerous goods, a full manifest of the cargo shall be retained ashore by the vessel's owner, or other designated person, in case of an incident. This person ashore should have a list of contact numbers for the emergency services and relevant manufacturers/suppliers of the dangerous goods. The designated person should be made aware of the details of the voyage.

## SECTION C - VESSELS CARRYING 12 PASSENGERS OR LESS

The standards and requirements contained within Section C of this Code apply to vessels carrying 12 passengers or less.

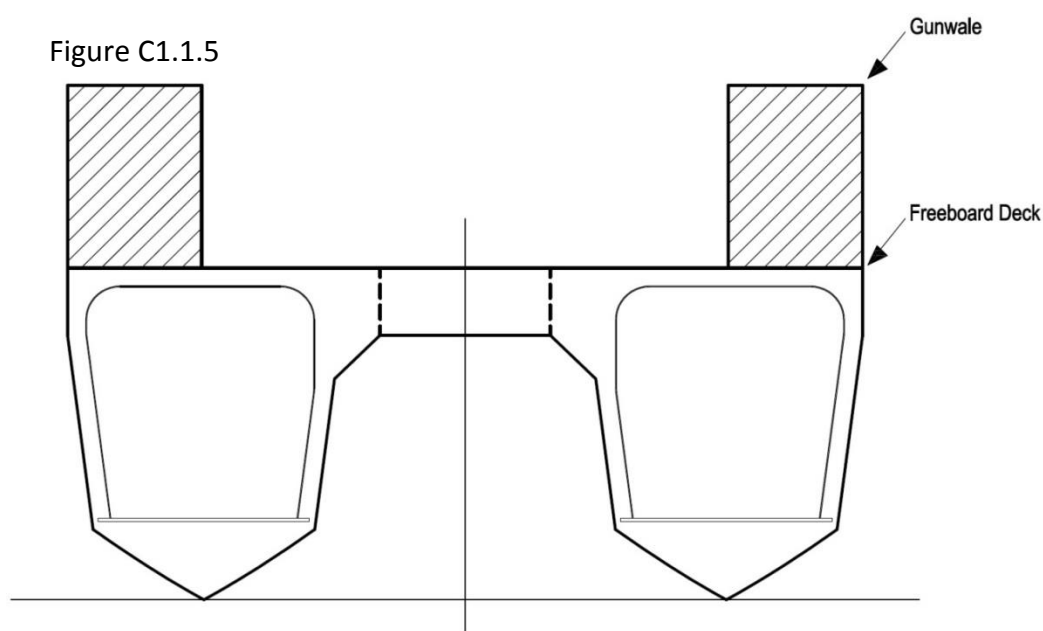
### C1.0 CONSTRUCTION AND STRUCTURAL STRENGTH

#### C1.1 General requirements

- C1.1.1 A vessel which operates in Area Category 0, 1, or 2 should be fitted with a watertight weather deck over the length of the vessel, satisfying the requirements of Section C1.3.1, and be of adequate structural strength to withstand the sea and weather conditions likely to be encountered in the intended area of operation (see C1.2.1).
- C1.1.2 A vessel which is not fitted with a watertight weather deck in accordance with Section C1.1.1 should normally be restricted to Area Category 3, 4, 5 or 6 and be provided with adequate reserves of buoyancy and stability for the vessel to survive the consequences of swamping when loaded with all the vessel's equipment, fuel, cargo, activity related equipment (eg diving equipment) and the number of persons for which it is to be certificated. (See sections C9.0 and C10.0 for applicable standard.) An open boat should normally be restricted to service in Area Categories 4, 5 and 6. Sections C1.1.3 and C1.1.4 apply to a vessel referred to in section C1.1.2.
- C1.1.3 An open boat should not carry cargo, or a combination of passengers and cargo, for which the cargo element is in excess of 1000Kg (refer to sections C9.0 and C10.0). Such a vessel may not be fitted with a lifting device, or be engaged in towing operations.
- C1.1.4 A motor vessel fitted with a watertight weather deck, which does not meet the freeboard requirements of Section C10.2, but which possesses adequate reserves of buoyancy (>10%) above the weather deck, may be considered for the operations defined in Section C1.1.3 above, provided the following conditions are satisfied:-
- i. Freeboard to the gunwale edge should meet that required by Section C10.2.3 (ii). Freeboard to the weather deck should be positive in all loading conditions.
  - ii. The recess bounded by the reserve buoyancy and gunwales should meet the standard for quick-draining cockpits within ISO 11812 - 'Small Craft - Watertight Cockpits and Quickdraining Cockpits', or equivalent.

- iii. The vessel should comply with the relevant intact stability criteria for transverse stability, and should display positive longitudinal stability, for the duration of the drain time.

C1.1.5 Figure C1.1.5 below shows a suitable type of arrangement for the purposes of section C1.1.4. Shaded areas show buoyancy above the watertight deck, in this case at the vessel sides, but which may equally be fore and aft.



## C1.2 Structural strength

- C1.2.1 The design of hull structure and construction should provide strength and service life for the safe operation of a vessel, at its service draught and maximum service speed, to withstand the sea and weather conditions likely to be encountered in the intended area of operation.
- C1.2.2 All vessels for operation in Area Category 0, 1 or 2 should be designed and built in accordance with the hull construction standards of a recognised Classification Society or equivalent standard eg Seafish design, or to first principles.
- C1.2.3 All vessels for operation in category 3 - 6 should be designed and built to a recognised standard satisfactory to the Certifying Authority for their intended use.
- C1.2.4 A vessel may be constructed of wood, fibre reinforced plastic (FRP), aluminium alloy, steel or combinations of such materials. Requirements for materials used for the construction of inflatable and rigid inflatable boats are given in Section C1.5.

- C1.2.5 Proposals to use any other material should be submitted to the Certifying Authority for consideration and approval. When a Certifying Authority considers it does not have the necessary expertise to deal with vessels of the hull material proposed, the Administration should be consulted with regard to the procedures to be adopted.
- C1.2.6 The hull of a vessel which has been surveyed and certificated by a UK Load Line Assigning Authority should be acceptable, subject to presentation of a Certificate of Construction.
- C1.2.7 UK Load Line Assigning Authorities, in addition to the MCA, are American Bureau of Shipping, Bureau Veritas, DNV GL, Lloyd's Register, Nippon Kaiji Kyokai and Registro Italiano Navale.
- C1.2.8 A vessel which has not been built under the survey of a UK Load Line Assigning Authority will be considered to be of adequate strength after a satisfactory examination by an authorised person and if it has been built:
- i. in accordance with the hull certification standards for small vessels, recognised by one of the Load Line Assigning Authorities; or
  - ii. in accordance with the hull certification standards for small vessels.
- C1.2.9 A vessel not built in accordance with either Section C1.2.6 or C1.2.8 may be specially considered, provided that full information (including calculations, drawings, details of materials and construction) is presented to and approved by the Certifying Authority.
- C1.2.10 A vessel with an existing certificate at the date of coming into force of the Code, or in possession of a valid Load Line Certificate or Load Line Exemption Certificate appropriate to the operational category shall continue to be considered of adequate strength for its existing category.

### **C1.3 Decks**

- C1.3.1 A watertight weather deck referred to in Section C1.1.1 should extend from stem to stern and have positive freeboard throughout, in any condition of loading of the vessel. (Minimum requirements for freeboard are given in Section C10.0.)
- C1.3.2 A weather deck may be stepped, recessed or raised provided the stepped, recessed or raised portion is of watertight construction.

- C1.3.3 Recesses for water freeing arrangements generally, see Section C3.0 and, for freeboard requirements, see Section C10.0.
- C1.3.4 For motor vessels, a recess in a weather deck complying with Section C1.3.1, should be of watertight construction and have means of drainage capable of efficient operation when the vessel is heeled to angle of  $10^{\circ}$ . Such drainage is to have an effective area, excluding grills and baffles, of at least  $20\text{cm}^2$  for each cubic metre of volume of recess below the weather deck.
- C1.3.5 Alternative arrangements for the size and drainage of a recess may be accepted provided it can be demonstrated that, with the vessel upright and at its deepest draught, the recess drains from a swamped condition within 3 minutes; or the cockpit or recess should comply with ISO 11812 (Small Craft - Watertight and Quick Draining Cockpits).
- C1.3.6 If a recess is provided with a locker which gives direct access to the interior of the hull, the locker should be fitted with weathertight cover(s). In addition the cover(s) to the locker should be permanently attached to the vessel's structure and fitted with efficient locking devices to secure the cover(s) in the closed position.

## **C1.4 Watertight bulkheads**

- C1.4.1 The strength of a watertight bulkhead and the effectiveness of any alternative means should be adequate for the intended purpose and to the satisfaction of the Certifying Authority.
- C1.4.2 When pipes, cables, etc penetrate watertight bulkheads, they should be provided with valves and/or watertight glands, as appropriate.
- C1.4.3 A doorway fitted in a watertight bulkhead should be constructed so as to be watertight from both sides and be kept closed at sea, unless opened for access only, at the discretion of the Master. A notice should be fitted to both sides of the door "To be kept closed at sea, open for access only". Sliding watertight doors, where fitted, are to be provided with suitable safety provision to avoid injury to personnel by closure of the door.
- C1.4.4 For vessels with a waterline length greater than 15m and operating in Area category 0, 1, or 2, a collision bulkhead should be fitted. The collision bulkhead is to be positioned within the forward 20% of the vessel length from the bow.

## C1.5 Inflatable and rigid inflatable boats

The following requirements should apply to an inflatable or rigid inflatable boat, other than a tender (dinghy).

### C1.5.1 Rigid inflatable boats in Area Categories 2 and 3

- i. Generally, a rigid inflatable boat which is intended to operate as an independent vessel in Area Category 2 or 3 (and is not a tender operating from a vessel) should be of a design and construction which would meet the requirements of Chapter III of the 1974 SOLAS Convention, as amended, and the parts of the Annex to IMO Resolution MSC.48(66) - "International Life-Saving Appliance Code", as amended, and MSC.81(70) - "Testing and Evaluation of Life-Saving Appliances", as amended - which are appropriate to the type of boat and subject to the variations which are given in the Code. Inflatable boats are not considered appropriate for operation in Area Categories 2 and 3.
- ii. A rigid inflatable boat may only be considered for operations in Area Category 2, if it has a permanent accommodation space for all persons on board which has a steering position for the vessel within it.
- iii. A rigid inflatable boat may only be considered for operations in Area Category 3, if fitted with a substantial enclosure for the protection of persons on board and purpose designed, subject to approval by the Certifying Authority. A substantial enclosure can be a permanently secured solid structure, or one that can be removed in harbour, provided when in place it is through bolted to the deck and adequately constructed to meet the designed vessel limitations. Portable canopies that are secured by lines or by fabric hook and loop fastening are not acceptable.
- iv. For Area Category 3 operation only, alternative provision for enclosures to that in (iii.) above may be considered, with operational/seasonal limitations. Such cases should be to the satisfaction of the Certifying Authority using the provisions of Annex 7.

### C1.5.2 Inflatable and rigid inflatable boats in Area Categories 4, 5 and 6.

- i. An inflatable boat or rigid inflatable boat, of less than 8m in length, which is intended to operate as an independent vessel in Area Category 4, 5 or 6 should be of a design and construction which would meet the requirements of ISO 6185 Part 2 or 3. Inflatable boats or rigid inflatable boats meeting the requirements of ISO 6185 Part 1 are not suitable for operation



under the Code of Practice. Vessels over 8m in length should be assessed in accordance with Section C1.2.4.

- ii. The structure of the rigid hull of a rigid inflatable boat may alternatively be assessed in accordance with Section C1.2.4.
- iii. When the production of boats is covered by an approved quality system and boats are built in batches to a standard design, prototype tests on one boat may be accepted for a boat of the same design submitted for compliance with the Code.
- iv. A boat should be of strength to withstand the sea and weather conditions likely to be encountered in the intended area of operation.

#### C1.5.3 Construction

- i. For boats complying with Section C1.5.2(i.), materials should satisfy the requirements of Chapter III of the 1974 SOLAS Convention, as amended, (including ISO 15372:2000 Ships and marine technology. Inflatable rescue boats. Coated fabrics for inflatable chambers), except that fire-retarding characteristics are not required for the hull material.
- ii. For boats complying with Section C1.5.2 (ii.) and C1.5.2 (iii.), materials should satisfy the requirements of ISO 6185, Part 2 or Part 3 as appropriate to the engine size.
- iii. A new boat of a type certified as a rescue boat or provided with a letter of compliance for use as a fast rescue boat for offshore stand-by vessels, or any equivalent certification or compliance, should be accepted as complying with the construction requirements of the Code.
- iv. A new boat which is not built in accordance with either Section C1.5.2 (i.), C1.5.2 (ii.) or C1.5.2 (iii.) may be specially considered, provided that full information (including calculations, drawings, details of materials and construction) is presented to and approved by the Certifying Authority.
- v. A permanent shelter provided for the protection of persons on-board should be of construction adequate for the intended purpose and the intended area of operation.

#### C1.5.4 Testing

- i. In addition to the survey regime in accordance with Section A1.0 the following should be applied during the life of the certificate:
  - a. Annually (by the owner/managing agent) - An airtightness test as follows:
    - Inflate each compartment of the boat individually to 120% of the safe working pressure.

- Check Integrity of tubes and seams for each compartment with soapy water and, in the case of a rigid inflatable boat, the integrity of the joints between the tubes and the hull.
    - Check that after 30 minutes the pressure is still at 120%.
    - Inflate all compartments to the safe working pressure, and record the ambient temperature. After 24 hours in this condition, pressures should be rechecked and the ambient temperature retaken and then check that the pressure is not less than 100% of working pressure.
  - b. A declaration should be sent to the Certifying Authority on completion.
- ii. At the renewal survey, testing shall be conducted to the satisfaction of the Certifying Authority by a competent person in accordance with the manufacturer's recommendations.

## **C2.0 WEATHERTIGHT INTEGRITY**

### **C2.1 General**

- C2.1.1 A vessel should be designed and constructed in a manner which will prevent the ingress of sea water and in particular comply with the following requirements. For strength and watertightness of closing appliances only, the requirements of ISO 12216 are considered acceptable.

### **C2.2 Hatchways and Hatches**

- C2.2.1 A hatchway which gives access to spaces below the weather deck should be of efficient construction and be provided with efficient means of weathertight closure.
- C2.2.2 A cover to a hatchway should be hinged, sliding, or permanently secured by other equivalent means to the structure of the vessel and be provided with sufficient locking devices to enable it to be positively secured in the closed position.
- C2.2.3 A hatchway with a hinged cover which is located in the forward half of the vessel should have the hinges fitted to the forward side of the hatch, as protection of the opening from boarding seas, except where it is not possible to do so, due to the shape of the hatch or the moulding it is in. A hatch with the hinges on the after side of the hatch should be secured closed at sea, and be provided with a suitable blank. This is not intended to apply to small technical spaces drained directly overboard, eg anchor lockers.
- C2.2.4 Hatches which are used for escape purposes should be capable of being opened from both sides.
- C2.2.5 Hatches in recessed or stepped decks of vessels described in C1.3.2, that provide access to sea inlet valves, should have access openings at least 300mm above the minimum freeboard to deck (see C10.2.2), or the sea inlet valves fitted with remote closing devices.
- C2.2.6 In general, hatches should be kept securely closed at sea. However, a hatch which is to be open at sea for lengthy periods should be:
- i. kept as small as practicable, but never more than 1m<sup>2</sup>
  - ii. in plane area at the top of the coaming;
  - iii. located on the centre line of the vessel or as close thereto as practicable;

- iv. fitted such that the access opening is at least 300mm above the top of the adjacent weather deck at side.

## **C2.3 Doorways and companionways**

- C2.3.1 A doorway located above the weather deck which gives access to spaces below should be provided with a weathertight door. The door should be of efficient construction, permanently attached to the bulkhead, not open inwards, and sized such that the door overlaps the clear opening on all sides, and has efficient means of closure which can be operated from either side.
- C2.3.2 A doorway should be located as close as practicable to the centre line of the vessel. However, if hinged and located in the side of a deckhouse, the door should be hinged on the forward edge.
- C2.3.3 A doorway which is either forward or side facing should be provided with a coaming, the top of which is at least 300mm above the weather deck. A coaming may be portable provided it can be permanently secured to the structure of the vessel and can be locked in position whilst at sea.
- C2.3.4 A companion hatch opening from a cockpit or recess which gives access to spaces below the weather deck should be fitted with a coaming or washboard, the top of which is at least 300mm above the sole of the cockpit or recess.
- C2.3.5 When washboards are used to close a vertical opening they should be so arranged and fitted that they will not become dislodged.
- C2.3.6 The maximum breadth of the opening of a companion hatch should not exceed 1m.

## **C2.4 Skylights**

- C2.4.1 A skylight should be of efficient weathertight construction and should be located on the centre line of the vessel, or as near thereto as practicable, unless it is required to provide a means of escape from a compartment below deck.
- C2.4.2 When a skylight is an opening type it should be provided with efficient means whereby it can be secured in the closed position.
- C2.4.3 A skylight which is provided as a means of escape should be capable of being opened from both sides.

- C2.4.4 Unless the glazing material and its method of fixing in the frame is equivalent in strength to that required for the structure in which it is fitted, a portable “blank” should be provided which can be efficiently secured in place in event of breakage of the glazing. The blank should be of suitable material and strength to the satisfaction of the Certifying Authority.

## **C2.5 Portlights and windows**

- C2.5.1 A portlight or window to a space below the weather deck or in a step, recess, raised deck structure, deckhouse or superstructure protecting openings leading below the weather deck should be of efficient construction which provides weathertight integrity (and be of strength compatible with size) for the intended area of operation of the vessel.
- C2.5.2 A portlight or window should not be fitted in the main hull below the weather deck, unless the glazing material and its method of fixing in the frame are equivalent in strength, with regard to design pressure, to that required for the structure in which it is fitted.
- C2.5.3 An opening portlight should not be provided to a space situated below the weather deck.
- C2.5.4 Portlights, windows and their frames should meet the appropriate Marine Standards defined in equivalent British, European, National or International Standards or Classification Society Rules.
- C2.5.5 A portlight fitted below the weather deck and not provided with an attached deadlight should be provided with a "blank" (the number of blanks should be sufficient for at least half of the number of such portlights of each different size in the vessel), which can be efficiently secured in place in the event of breakage of the portlight. The blank should be of suitable material and strength to the satisfaction of the Certifying Authority. Such a "blank" is not required for a non-opening portlight which satisfies Section C2.5.2.
- C2.5.6 An opening portlight should not exceed 250mm in diameter or equivalent area.
- C2.5.7 A window fitted in the main hull below the weather deck should meet the requirements of Section C2.5.2, or be provided with a “blank” meeting the requirements of Section C2.5.8.
- C2.5.8 In a vessel which operates more than 60 miles from a safe haven, portable "blanks" for windows should be provided (the number of

blanks should be sufficient for at least half of the number of such windows of each different size in the vessel) which can be efficiently secured in place in the event of breakage of a window.

C2.5.9 For the wheelhouse:

- i. windows and their frames should meet the requirements of Section C2.5.4, having due regard to the increased thickness of windows comprising one or more laminations in order to achieve equivalent strength; and
- ii. polarised or tinted glass should not be used in windows provided for navigational visibility (although portable tinted screens may be provided for nominated windows).
- iii. wheelhouse visibility - see section C7.1.2.

## C2.6 Ventilators and exhausts

- C2.6.1 A ventilator should be of efficient construction and, where situated on the weather deck and not complying with Section C2.6.3, should be provided with a readily available means of weathertight closure, consideration should be given to requirements of Fire Protection (Section C11.0).
- C2.6.2 A ventilator should be kept as far inboard as practicable and the height above the deck of the ventilator opening should be sufficient to prevent the ready admission of water when the vessel is heeled (see Sections C9.3, C9.4, C9.6 and C9.8).
- C2.6.3 A ventilator which must be kept open, eg for the supply of air to machinery or for the discharge of noxious or flammable gases, should be specially considered with respect to its location and height above deck having regard to Section C2.6.2 and the downflooding angle (see Sections C9.3, C9.4, C9.6 and C9.7).
- C2.6.4 Vessels which are fitted with engine air intakes in the hull side, which do not satisfy the requirements of C2.6.1, C2.6.2 and C2.6.3, may be accepted by a Certifying Authority, but the risk of fire in the engine space or downflooding should be taken into consideration and restrictions on operations will be necessary. Such an air intake must be capable of being remotely closed before the activation of a fixed fire extinguishing system for the machinery space, as required by C12.6.3.
- C2.6.5 An engine exhaust outlet which penetrates the hull below the weather deck should be provided with means to prevent backflooding into the hull through the exhaust system. The means may be provided by

system design and/or arrangement, built-in valve or a portable fitting which can be applied readily in an emergency.

## **C2.7 Air pipes**

- C2.7.1 When located on the weather deck, an air pipe should be kept as far inboard as possible and have a height above deck sufficient to prevent inadvertent downflooding when the vessel is heeled (see Sections C9.3, C9.4, C9.6 and C9.7).
- C2.7.2 An air pipe, of greater than 10mm inside diameter, serving a fuel or other tank should be provided with a permanently attached means of weathertight closure. Means of closure may be omitted if it can be shown that the open end of the air pipe is afforded adequate protection by other means, which will prevent the ingress of water.
- C2.7.3 An air pipe serving a fuel tank (also see Section C4.4.) or other tank, where provided with a closing appliance, should be of a type which will prevent excessive pressure on the tank boundaries. Provision should be made for relieving a vacuum when tanks are being drawn from or emptied.

## **C2.8 Sea inlets and discharges**

- C2.8.1 An opening below the weather deck should be provided with an efficient means of closure.
- C2.8.2 When an opening is for the purpose of an inlet or discharge below the waterline it should be fitted with a seacock, valve or other effective means of closure which is readily accessible.
- C2.8.3 When an opening is for a log or other sensor, which is capable of being withdrawn, it should be fitted in an efficient watertight manner and provided with an effective means of closure when such a fitting is removed. A non-metallic, or non-flush metallic fitting, log or sensor should not be fitted in machinery spaces or in any spaces in vessels that operate at high speed unless located in small cofferdams designed for the purpose and with any access panels and service transits made watertight. If access is designed to be opened at sea, a test cock should be provided.
- C2.8.4 Inlet and discharge pipes from marine toilets should be provided with shell fittings as required by Section C2.8.2. When the rim of a marine toilet is less than 300mm above the deepest waterline of the vessel,

unless otherwise indicated by manufacturer's recommendations, anti-syphon measures should be provided.

- C2.8.5 Observation glasses fitted in sea water systems below the deepest anticipated waterline, including any trim or heel, shall be so protected as to minimise the risk of mechanical damage, failure and consequential flooding.

## **C2.9 Materials for valves and associated piping**

- C2.9.1 A valve or similar fitting attached to the side of the vessel below the waterline, within an engine space or other high fire risk area, should be normally of steel, bronze, copper, or other non-brittle fire resistant material or equivalent.
- C2.9.2 When plastic piping is used it should be of good quality and of a type suitable for the intended purpose.
- C2.9.3 Flexible or non-metallic piping, engine room bulkhead and deck penetrations, which present a risk of flooding, fitted in an engine space or fire risk area should be efficiently insulated against fire, or be of fire resistant material, eg ISO Standard 7840, or exhaust quality rubber hosing.



## C3.0 WATER FREEING ARRANGEMENTS

- C3.1.1 When a deck is fitted with bulwarks such that shipped water may be trapped behind them, the bulwarks should be provided with efficient freeing ports that will ensure the deck can be effectively drained. This section is not intended to apply to inflatable boats or boats fitted with a buoyant collar, as these requirements are dealt with in other parts of the Code.
- C3.1.2 The area of freeing ports should be at least 4% of the bulwark area and be situated in the lower third of the bulwark height, as close to the deck as practicable.
- C3.1.3 A vessel of less than 12m in length, having a well deck aft which is fitted with bulwarks all round and which is intended to operate no more than 60 miles from a safe haven (Area Categories 2, 3, 4, 5 and 6), should be provided with freeing ports required by Section C3.1.2 or may be provided with a minimum of two ports fitted (one port and one starboard), which may be in the transom, each having a clear area of at least 225cm<sup>2</sup> (0.0225m<sup>2</sup>). Ports may only be fitted in the transom on vessels where under all foreseeable conditions water will drain.
- C3.1.4 Smaller ports may however be accepted in a vessel having only small side deck areas in which water can be trapped, the reduced area being based on the volume of water which is likely to become so trapped. The following correction to the required freeing port area may be applied:-

$$FP_{REQ} = FP_{MAX} * ( A_{ACT} / A_{MAX} )$$

Where

$FP_{REQ}$  = Freeing port area required

$FP_{MAX}$  = Maximum freeing port area required

$A_{ACT}$  = Actual area of deck fitted with enclosed bulwarks, excluding superstructure or deckhouse area

$A_{MAX}$  = Area of maximum sized well (0.7L x B) where L and B are the dimensions of the vessel

- C3.1.5 When a non-return shutter or flap is fitted to a freeing port it should have sufficient clearance to prevent jamming and any hinges should have pins or bearings of non-corrodible material.
- C3.1.6 Structures and spaces considered to be non-weathertight should be provided with efficient drainage.

- C3.1.7 Where cargo is to be stowed on deck, the stowage arrangement should be such as to not impede the free flow of water from the deck.
- C3.1.8 Where independent self-contained wheelhouses are fitted, provisions are to be made so that such wheelhouses can drain quickly, typically in the event of wheelhouse window failure and consequential flooding.

## **C4.0 MACHINERY**

### **C4.1 General requirements**

- C4.1.1 Generally, machinery installations should comply with the requirements given below. Other installations proposed may be specially considered, provided that full information is presented to and approved by the Administration.
- C4.1.2 The main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the vessel should be designed to operate when the vessel is upright and when inclined at any angle of heel and trim up to and including 15° and 7.5° respectively either way under static conditions.
- C4.1.3 A vessel fitted with either a petrol or diesel engine should be provided with an engine suitable for marine use and with sufficient fuel tankage for its area of operation.
- C4.1.4 Where it is proposed to use low flash point fuels (other than petrol or diesel), the operator should contact the Administration for guidance early in the project and the proposal shall be supported by a detailed risk assessment. Consideration should be given to safe storage and use of the fuel on board in approved containers using approved pipe systems where appropriate. The operator will need to satisfy the Administration that an appropriate level of safety is provided, which shall include the machinery installation being verified against UK authorised Classification Society standards and being in general compliance with national standards. The operator should take consideration of fuel transportation, carriage, storage ashore, and refuelling operations which shall be in accordance with Health and Safety Executive requirements.

### **C4.2 Diesel engines**

- C4.2.1 A vessel may be fitted with either an inboard or an outboard diesel engine.

### **C4.3 Petrol engines**

- C4.3.1 A petrol engine may be accepted provided that the engine is a suitable outboard type.

- C4.3.2 A vessel of any type may be fitted with a small engine (usually less than 4.5kW) manufactured with an integral fuel tank, provided a safety warning sign is displayed with details of appropriate precautions to be taken when filling the fuel tank.
- C4.3.3 Vessels other than inflatable boats should supply fuel to the engine from either:
- i. permanently installed fuel tank/s constructed to an appropriate standard and in the case of vessels fitted with a watertight weather deck shall have arrangements such that spillage during fuel handling will drain into a suitable receptacle to prevent it draining overboard. A RIB's permanently installed tank/s should not form part of the hull; or
  - ii. if the vessel is less than 8m length or is a vessel with a total power rating of less than 75kW, a separate tank of 55 litres or less with a handle, or two tanks of 27 litres or less, where two outboard engines are fitted, in capacity complying to an appropriate standard, provided that the portable tank arrangement is of a suitable proprietary design where the tank meets the securing, ventilation and filling arrangements in Section C5.5. The tank/s must be fitted with the standard quick connection to the outboard engine without the risk of any spillage and the batteries should be linked by an emergency link isolator or other means of cross-connecting to allow the starting of an engine with a flat battery.
- C4.3.4 Inflatable boats less than 8m length overall, with engines of less than 15kW power rating, that do not have an integral fuel tank, should supply fuel to the engine from a separate tank of 27 litres or less in capacity complying with an appropriate standard. The tank must be fitted with the standard quick connection to the outboard engine without the risk of any spillage. The securing, ventilation and filling arrangement of this tank should meet the requirements of C4.4.
- C4.3.5 In locations where an accumulation of hydrocarbon vapours is likely to occur, a suitable hydrocarbon gas detector should be fitted under or adjacent to the tank (located in a safe place). The detector components and any other electrical equipment residing in the vapour area should not be capable of causing ignition.
- C4.3.6 A vessel should be provided with sufficient fuel for its intended area of operation, spare portable petrol containers must not be carried on board (containers intended for refuelling a tender are excluded from this) unless it is judged to be essential to assure the safe completion of a particular voyage or excursion (see Section C4.8).

- C4.3.7 Attention is drawn to the electrical arrangement requirements (Section C6.6).

## **C4.4 Installation**

- C4.4.1 The machinery, fuel tank(s) and associated piping systems and fittings should be of a design and construction adequate for the service for which they are intended. These should be installed and protected so as to reduce to a minimum danger to persons during normal movement about the vessel, with due regard being paid to moving parts, hot surfaces and other hazards.
- C4.4.2 Special consideration should be given to the design and installation of high pressure fuel pipe systems on diesel machinery to reduce the risk of oil mist fires through failure of the pipes or associated fittings, particularly where they are exposed to excessive temperatures and vibrations. Mitigations could include the use of double skinned pipes, shielding, insulation of hot surfaces, proximity and protection of electrical apparatus, anti-vibration measures and fuel oil mist detection or a combination of these measures.
- C4.4.3 Means should be provided to isolate a source of fuel which may feed a fire in an engine space. A valve or cock, which is capable of being closed from a position outside the engine space, should be fitted in the fuel feed pipe as close as possible to the fuel tank.
- C4.4.4 Fuel filling and venting pipes should be constructed of fuel compatible, fire resistant, non-kinking material, adequately supported and of sufficient dimensions to prevent spillage during filling.
- C4.4.5 A venting pipe should be led to the open atmosphere, terminating in a position level with or higher than the fuel filling mouth and its open end protected against:-
- i. water ingress - by a goose neck or other efficient means; and
  - ii. where there is a risk from flame ingress - by a suitable gauze diaphragm (which can be detached for cleaning).
- C4.4.6 Fuel filling and ventilation pipes should be arranged to prevent over pressure of the fuel tank systems during filling. As a general guide, a

ventilation pipe from a fuel tank intended to be filled by on board transfer pumps or a pressurised system should have a diameter of not less than 1.25 times the diameter of the filling pipe. Small tanks intended to be filled directly by shore fuel line and nozzle may be accepted with a minimum 11mm diameter vent pipe at the top of the tank, if the filling line runs directly and near vertically to the top of the tank and has inside diameter of at least 32mm (solid pipe) or 38mm (hose).

- C4.4.7 Any fuel vent pipe opening should be not less than 400mm from any ventilation opening through which fuel vapour may enter the vessel.
- C4.4.8 In a fuel supply system unit, where a flexible section of piping is introduced, the flexible pipes should be fire resistant/metal reinforced or otherwise protected from fire. The flexible pipes shall be secured by either metal hose clamps or permanently attached end fittings (eg swaged sleeve or sleeve and threaded insert). Where hose clamps are used, the fitting to which the flexible pipe attaches should have a bead, flare, annular grooves or other means of preventing slippage, the anti-slippage arrangement shall not provide a path for fuel leakage.
- C4.4.9 When the main engine(s) oil fuel system is provided with water separator filter(s) of a type which has plastic or glass bowl(s), it should be located so that it can be easily seen and protected against heat and accidental damage.

## **C5.5    Securing, ventilation and filling arrangements of petrol tanks**

- C5.5.1 A [portable / separate] petrol tank or a spare portable petrol container should be secured to the weather deck, in such a way that prevents its movement in a seaway and is able to be quick released in case of a need to jettison. The securing arrangement should also mitigate any risks associated with damage to the tank that could be caused by loose cargo or other equipment. It should also be ventilated and drained into a suitable receptacle to prevent any leakage overboard. The tank/s must not be filled on board or decanted by other means whilst the vessel is at sea.

## **C5.6 Engine starting and stopping**

- C5.6.1 An engine should be provided with either mechanical starting, air starting, hand starting or electric starting with independent batteries, or other means of starting acceptable to the Certifying Authority.
- C5.6.2 When the sole means of starting is by battery, the battery should be in duplicate and connected to the starter motor via a 'change over switch' so that either battery can be used for starting the engine. Charging facilities for the batteries should be available. Under normal circumstances it is not recommended to discharge both batteries in parallel.
- C5.6.3 For air start systems there should be 2 air receivers each with sufficient capacity to allow 6 consecutive starts of a cold engine. Design, maintenance, inspection and test of compressed air start systems should be according to an appropriate Class standard.
- C5.6.4 All internal combustion machinery, associated ventilation fans, oil transfer pumps, centrifuges etc should have a secure means of remote stopping from outside the engine space.
- C5.6.5 All inflatable boats, boats fitted with a buoyant collar, and open boats that achieve planing speed, including tenders, when fitted with remote throttle controls, should be fitted with a kill-cord, to be used at all times during navigation. A spare kill cord should also be carried on board.

## **C5.7 Portable equipment**

- C5.7.1 When portable equipment powered by a petrol engine is provided, the unit, unless fully drained of fuel, should normally be stored on the weather deck.
  - i. Alternatively it may be stowed in a deck locker or protective enclosure which is to the satisfaction of the Certifying Authority and meets the following requirements:
    - a. vapour tight to the vessel's interior;
    - b. not openable from the vessel's interior; and
    - c. adequately drained overboard and ventilated to atmosphere.
  - ii. A safety warning sign should be displayed with details of appropriate precautions to be taken when filling the fuel tank.

- C5.7.2 Gas welding and cutting equipment bottles, if carried, should be stowed in a secure manner on the open deck at a safe distance away from any potential source of fire and should have the capability of being readily jettisoned overboard if necessary.

## **C5.8 Stowage of spare petrol**

- C5.8.1 When spare petrol is carried on board in a portable container/s, for any purpose for use on board the vessel (see C7.3.3), the quantity should be kept to a minimum (eg maximum of two 5 litre containers), the containers should be clearly marked and should normally be stowed on the weather deck where they can readily be jettisoned, where they are ventilated and where spillage will drain directly overboard (see C5.8.2). Any spare portable petrol container/s should meet the securing requirements of C5.5.
- C5.8.2 In small vessels where Section C5.8.1 is not practicable, a 5 litre container of petrol may be stowed in a deck locker which meets the requirements of Section C5.7.1 (i).



## **C6.0 ELECTRICAL ARRANGEMENTS**

### **C6.1 General**

- C6.1.1 Electrical arrangements should be such as to minimise the risk of fire and electric shock. Tanks, machinery or other metallic objects which do not have good electrical continuity with the water surrounding the vessel should have special earthing arrangements to reduce such risks.
- C6.1.2 Electrical equipment should be suitable for use in a marine environment with due consideration of humidity, temperature and vibration. Special consideration should be given to the choice and installation of electrical equipment that could be subjected to large vibration and shock loadings eg Offshore Service Vessels.

### **C6.2 Systems**

- C6.2.1 DC systems should be two conductor, except that single conductor systems are acceptable for engine circuits comprising engine mounted equipment which have a return connection made at the engine itself.
- C6.2.2 AC systems should normally be two wire insulated for single phase, or three or four wire 3 phase system, with insulated neutral in the case of a four wire system. Alternative arrangements with earthing of neutral conductor may be specially considered by the Certifying Authority.
- C6.2.3 A single phase AC or 2 wire DC system in which there is no intentional connection of the circuit to earth (an insulated system) should be provided with double pole switches, except that single pole switches protection may be used in the final sub-circuits in dry accommodation spaces.
- C6.2.4 Single pole switches are only acceptable when used in the 'live' (+) conductor in a system with one pole earthed. Fuses or circuit breaker protection should not be installed in an earthed conductor.

- C6.2.5 All circuits, except the main supply from the battery to the starter motor and electrically driven steering motors and final sub circuits, should be provided with electrical protection against overload and short circuit on all insulated poles, (ie fuses or circuit breakers should be installed). The rating of over current protection devices should not exceed the rated current capacity of the conductor being protected. Short circuit protection should be suitable for the total rated current of the consumers in the circuit protected. Where a single outboard engine is installed, and fitted with in-line fuses, suitable procedures should be established to enable the engine to be started in the event of a damaged fuse.
- C6.2.6 Steering circuits, the loss of which would lead to steering failure, should have an overload alarm in lieu of overload protection (this does not apply to auto-pilot motors). However all circuits should be protected against short circuit.
- C6.2.7 AC circuits supplying domestic consumers and socket outlets should be provided with earth leakage protection with maximum trip setting of 30mA.
- C6.2.8 Shore supply circuits should be provided with earth leakage protection with maximum trip setting of 30mA.
- C6.2.9 Shore supply systems should be protected against overloads and short circuits, with protection on all insulated poles.
- C6.2.10 Three phase shore supplies should be fitted with phase indication to ensure correct phase sequence.
- C6.2.11 On metal vessels, shore supply systems should be fitted with efficient galvanic isolation.
- C6.2.12 On all vessels consideration should be given to the efficient bonding of metal components in contact with sea water to minimise galvanic corrosion.

### **C6.3 Lighting**

- C6.3.1 For lighting distribution in common accommodation areas, it is recommended that the lighting is distributed on different final circuits to maintain a level of lighting in case of failure of a single distribution circuit.
- C6.3.2 Consideration should be given to the design and placement of lighting in order to preserve the night vision of Navigation Watchkeepers.

## C6.4 Batteries

- C6.4.1 Batteries and battery systems should be provided as indicated in Section C5.6.1, C5.6.2 as well as to support communications equipment.
- C6.4.2 The battery terminals should be protected against accidental contact with metallic objects.
- C6.4.3 Battery charging systems should be fitted with circuitry to prevent overcharging and over-voltage, and should have a charge indicator.
- C6.4.4 A battery cut-out switch should be provided for all systems. It is preferred that this switch acts as an isolator, ie it is double pole, however, single pole is acceptable on the positive conductor. If a battery change-over switch is fitted and is provided with an "off" position, this may serve as the cut-out switch also.
- C6.4.5 Battery Stowage
- i. All batteries should be secured firmly to avoid movement when the vessel is subjected to sudden acceleration or deceleration, a large angle of heel or trim.
  - ii. Where the maximum charging power output is less than 0.2kW the batteries may be located in any suitable ventilated space without any special container requirements.
  - iii. Where the maximum charging power output is between 0.2 and 2kW for nickel-cadmium batteries, or 0.2 and 3kW for lead-acid batteries, the batteries may be located in the machinery space or other well-ventilated space in a ventilated box or locker.
  - iv. Where the maximum charging power output exceeds 2kW for nickel-cadmium batteries, or 3kW for lead-acid batteries (calculated on the basis of the maximum charging current and the nominal voltage of the battery and taking into account the characteristic charging curve of the charging appliance) the batteries shall be installed in a ventilated dedicated compartment within the vessel or a locker on the open deck. In either case stowage space is to be for batteries only.

#### C6.4.6 Ventilation

- i. To ensure that any evolved hydrogen released by lead-acid batteries during charging is expelled, battery compartments, lockers and containers should be supplied with air at a level below the top of the batteries, and should be exhausted from the highest point of the space directly to the open air with bends of no more than 45°.
- ii. Ventilation ducts shall not include any devices which obstruct the air flow, such as stop valves.
- iii. If natural ventilation is impractical or insufficient, mechanical ventilation shall be provided.
- iv. Where mechanical ventilation is employed, the battery charging system(s) shall be interlocked so as to switch off if the ventilation fails. A warning device shall be provided and operate if failure occurs.
- v. If mechanical means are employed to ventilate a battery compartment directly, then the components must not be a potential source of ignition.
- vi. Switches and fuses or other equipment, which may generate sparks shall not be placed in battery compartments or containers.
- vii. Cable entries to battery compartments shall be gas-tight.

### C6.5 Cables

- C6.5.1 Electric cables should be constructed to a recognised standard for marine use in small vessels.
- C6.5.2 Cables which are not provided with electrical protection should be kept as short as possible and should be “short circuit proofed”, eg single core with an additional insulated sleeve over the insulation of each core and further protected against mechanical damage. Normal marine cable, which is single core, will meet this requirement without an additional sleeve, since it has both conductor insulation and a sheath.
- C6.5.3 Note that when selecting cables, particular attention should be given to environmental factors such as temperature and contact with damaging substances, eg polystyrene, which degrades PVC insulation.
- C6.5.4 Adequate provision should be made for securing electrical connections, eg by use of locking washers.
- C6.5.5 Cables should be secured & protected against chafe. For example, where they enter and exit cable pipes or bulkhead transits.

- C6.5.6 In large machinery spaces, where cables are attached to overhead cable trays, they should be secured with metal cable clips at sufficient intervals to prevent cables being detached in the event of fire which could impede any emergency access or escape within that space.
- C6.5.7 Cables that supply emergency services, where passing through high fire risk areas should be of fire resistant type or given equivalent protection to the satisfaction of the Certifying Authority.

## **C6.6 Hazardous spaces**

- C6.6.1 Where practicable, electrical equipment should not be installed in a space where petroleum vapour or other hydrocarbon gas is likely to accumulate. When equipment is installed in such a space it must comply with a recognised standard for prevention of ignition of a flammable atmosphere.
- C6.6.2 Any compartment which contains a gas consuming appliance or any compartment into which flammable gas may leak or accumulate, should be provided with a hydrocarbon gas detector and alarm. The detector and alarm should be designed to comply with a recognised standard in accordance with Section C6.6.1. (Refer to Section C11.5.)
- C6.6.3 Where explosion proof electrical equipment is fitted on board a vessel, it must be maintained in accordance with the manufacturers' requirements and serviced appropriately to maintain its certified explosion proof characteristics.

## **C6.7 Lightning protection**

- C6.7.1 Where a considerable risk of lightning strike is identified, it is recommended that attention is paid to lightning strike protection. For information on lightning protection, reference should be made to ISO10134 "Small Vessels Electrical Devices - Lightning Protection Systems".

## C6.8 Emergency Supplies

### C6.8.1 Emergency Lighting

When general lighting within a vessel is provided by a centralised electrical system, an alternative source of lighting (which may be a suitable portable battery operated lamp(s) if practical, taking into consideration the size and complexity of the vessel) should be provided. This alternative source of lighting should be sufficient to:-

- i. enable persons to make their way to the open deck;
- ii. illuminate survival craft launching and embarkation;
- iii. illuminate man-overboard rescue equipment and rescue areas;
- iv. permit work on essential machinery.

This alternative source of lighting should be capable of operation for a period of time sufficient to enable the safe mustering and evacuation of all persons on board.

### C6.8.2 Emergency Radio

Emergency supplies to GMDSS radio equipment should be designed and installed to supply the equipment for a minimum of 3 hours in the event of failure of the main electrical supply.

### C6.8.3 Navigational Supplies

Emergency power should be readily available to supply navigation lights and navigation equipment for a minimum of 3 hours. The navigation equipment to be supplied by emergency power should include Global Navigation Satellite System (GNSS), echo sounder and Automatic Identification System (AIS).

### C6.8.4 Emergency Batteries

Batteries supplying essential services (emergency lighting, steering systems, navigation and communications equipment) should be located in a position not likely to flood in normal operations or in the event of minor damage.

## **C7.0 STEERING GEAR, RUDDER AND PROPELLER SYSTEMS**

### **C7.1 Steering**

- C7.1.1 A vessel should be provided with efficient means of steering.
- C7.1.2 The control position should be located so that the person conning the vessel has a clear view for safe navigation in all normal conditions of loading and especially directly ahead.
- C7.1.3 When steering gear is fitted with remote control, arrangements should be made for emergency steering in the event of failure of the control. Arrangements may take the form of the following, and be to the satisfaction of the Certifying Authority:
- i. a tiller to fit the head of the rudder stock; or
  - ii. a rod attachment which may be fitted to a Z-drive framework; or
  - iii. a steering oar; or
  - iv. in the case of twin screw vessels manipulation of power distribution between the drives. In the case of twin stern-drive arrangements, means should be provided to lock the drives in the midships position; or
  - v. in the case of a vessel fitted with outboard engine(s), a means to control the direction of thrust.
- C7.1.4 If emergency steering is impractical, alternative safety measures and/or procedures to deal with any steering failure situation should be agreed with the Certifying Authority. (The Certifying Authority may consider the application of restrictions to the service area of the vessel.)
- C7.1.5 Steering systems should comply with an appropriate standard for small craft steering systems.

### **C7.2 Rudder system**

- C7.2.1 As appropriate to the vessel, the rudder and rudder stock construction materials, design in total (including tiller head attachments, bearings and pintles) and the supporting structures should be adequate for the operating conditions of the vessel. Recognised design standards should be used.
- C7.2.2 Construction and fittings should be to an appropriate standard, to the satisfaction of the Certifying Authority.

### **C7.3 Propeller system**

- C7.3.1 As appropriate to the vessel, propeller line shaft(s) construction materials and design in total (including shaft brackets, propeller securing, bearings, stern tube and thrust block) and supporting structures should be adequate for the operating conditions for the vessel. Recognised design standards should be used.
- C7.3.2 Construction and fittings should be to an appropriate standard, to the satisfaction of the Certifying Authority.



## **C8.0 BILGE PUMPING**

### **C8.1 General system requirements**

- C8.1.1 A vessel should have an efficient bilge pumping system, with suction pipes so arranged that any compartment (other than a tank permanently used for the carriage of liquids which is provided with efficient means of pumping or drainage) can be drained.
- C8.1.2 Provided the safety of a vessel is not impaired, the Certifying Authority may permit dispensation from the means of pumping or drainage of particular compartments.
- C8.1.3 A bilge pump (other than a portable pump) should be self-priming and be capable of being operated with all hatchways and companionways closed.
- C8.1.4 When considered necessary to protect the bilge suction line from obstruction, an efficient strum box should be provided.
- C8.1.5 When considered necessary, to prevent back flooding, bilge suction valves should be of non-return type.
- C8.1.6 Means of providing efficient bilge pumping other than those described in this text may be considered provided that full information is submitted to and approved by the Certifying Authority.
- C8.1.7 All compartments shall be able to be drained when the vessel is heeled to an angle of 10°.

### **C8.2 Vessels carrying 16 or more persons or operating in area categories 0 or 1**

- C8.2.1 A vessel should be provided with at least two bilge pumps situated in not less than two separate spaces, one of which should be hand operated with a capacity of not less than 70 litres per minute. Where two pumps are fitted in this arrangement, the hand operated pump may be omitted in favour of a second powered pump providing the two pumps draw power from independent power sources. All pumped spaces should be capable of being drained after the failure of one pump.
- C8.2.2 The bilge pumps should have a combined capacity of not less than 210 litres per minute. One pump should be power driven with a capacity not less than 140 litres per minute.

### **C8.3 Vessels carrying 15 or fewer persons and operating in area categories 2 to 6**

- C8.3.1 Unless otherwise specified in Section C8.4, a vessel should be provided with at least two bilge pumps, one of which should be hand operated with a capacity of not less than 70 litres per minute, situated in two separate spaces. Where two pumps are fitted in this arrangement, the hand operated pump may be omitted in favour of a second powered pump providing the two pumps draw power from independent power sources. All pumped spaces should be capable of being drained after the failure of one pump. The bilge pumps should have a combined capacity of not less than 140 litres per minute.

### **C8.4 Open boats, inflatable boats and boats with a buoyant collar**

- C8.4.1 All open boats, of 6m in length and over, should carry a hand bailer or bucket in addition to the bilge pumping requirements in Section C8.2 or C8.3.
- C8.4.2 For vessels of less than 6m in length, operating in Category 6, a minimum of one hand powered bilge pump or a bailer or a bucket is to be provided.
- C8.4.3 Buckets required for this section may also be counted in any requirements for buckets given in Section C12.0.

### **C8.5 Bilge alarms**

- C8.5.1 A bilge alarm should be fitted;
- i. in any watertight compartment containing propulsion machinery; and
  - ii. in any other compartment likely to accumulate bilge water, ie where a skin fitting is present, excluding void spaces, where the bilge level cannot be readily seen.
- C8.5.2 To prevent pollution, compartments containing potential pollutants, including machinery spaces, should not be fitted with auto-start bilge pumps.

- C8.5.3 An auto-start bilge pump serving a clean compartment where a significant quantity of water could accumulate unnoticed, should be fitted with an audible alarm at the control position(s). Should a number of such locations/alarms be present, then visual alarm indication should also be fitted to enable rapid location of the source of the alarm.
- C8.5.4 The alarm should provide an audible warning, and preferably a visual warning also, at the control position.

## **C9.0 STABILITY**

### **C9.1 All vessels**

- C9.1.1 The standard of stability to be achieved by a new vessel should be dependent on the maximum number of persons permitted to be carried and the intended area of operation. For the purposes of this Code a person is taken to weigh 82.5Kg.
- C9.1.2 The following vessels are required to be provided with a stability information booklet which is approved by the Certifying Authority:
- i. vessels operating in Category 0 or 1; or
  - ii. vessels carrying 16 or more persons; or
  - iii. vessels carrying cargo greater than 1,000kg; or
  - iv. vessels fitted with a lifting device as defined in C9.10; or
  - v. vessels towing where the towed object's displacement is greater than twice the displacement of the towing vessel. See Section C9.11; or
- Guidelines on the minimum Form and Content of a stability book and guidance on minimum levels of checking for Certifying Authorities leading to approval are contained in Annex 8.
- C9.1.3 A vessel other than one for which C9.1.2 applies should either comply with Section C9.1.2 or be subject to a simplified assessment of stability in C9.4, and is not required to be provided with approved stability information.
- C9.1.4 For stability requirements for an inflatable vessel or a vessel fitted with a buoyant collar, see Section C9.5. For stability requirements for a decked vessel fitted with a lifting device, see Section C9.10 and for a decked vessel engaged in towing, see Section C9.11.
- C9.1.5 All vessels, other than those vessels deemed unsuitable for carriage of the booklet by the Certifying Authority (ie vessels with no cabin or shelter), are required to carry the relevant copy of the MCA Stability Guidance Booklet (Motor). Where a booklet is not carried on board a copy is to be made available to crew ashore. These booklets are available free of charge from the MCA or Certifying Authority. Although they contain generic safety advice, the stability and freeboard data already generated during the survey process should be appended to the booklet in the relevant section. It is the responsibility of the Certifying Authority to supply this information, and the owner/managing agent is to ensure this data is included.

## C9.2 Damage survivability

- C9.2.1 This section applies to all vessels carrying 16 or more persons (total souls on board) and those operating in Area Category 0 and 1, with 7 or more persons (total souls on board), subject to minimum safe manning levels being agreed by the Certifying Authority.
- C9.2.2 Multihull vessels should be fitted with engine rooms that are separated by a watertight bulkhead.
- C9.2.3 In assessing survivability, the following standard permeabilities should be used:-

Space	Permeability %
Appropriated for stores	60
Appropriated for stores but not by a substantial quantity thereof	95
Appropriated for accommodation	95
Appropriated for machinery	85
Appropriated for liquids	0 or 95 whichever results in the more onerous requirements

Other methods of assessing floodable volume may be considered, to the satisfaction of the Certifying Authority.

- C9.2.4 In assessing survivability the vessel should meet the damage stability criteria for one of two methods. The first (denoted Option 1) considers minor hull damage scenarios with limited equilibrium trim and heel angles after damage. This has historically been used by monohulls and some catamarans. The second method (denoted Option 2) considers minimum length single compartment damage scenarios with more onerous residual stability, combined with increased allowable equilibrium angles after damage. This Option 2 has been developed to address particular stability issues raised by low waterplane area vessels with deep hulls which typically have large intact freeboards such as catamarans.

- C9.2.5 Damaged Stability, Option 1

Vessels should be so arranged that after minor hull damage or failure of any one hull fitting in any one watertight compartment, it will satisfy the residual stability criteria below. This may be achieved by fitting water-tight subdivision or alternative methods to the satisfaction of the Certifying Authority. Minor damage should be assumed to occur anywhere in the vessel but not on a watertight subdivision.

- i. In the damaged condition, the residual stability should be such that:
  - a. the angle of equilibrium does not exceed  $7^{\circ}$  from the upright;
  - b. the resulting righting lever curve has a range to the downflooding angle of at least  $15^{\circ}$  beyond the angle of equilibrium;
  - c. the maximum righting lever within that range is not less than 100mm;
  - d. the area under the curve is not less than 0.015m radians;
  - e. this damage should not cause the vessel to float at a waterline less than 75mm from the weatherdeck at any point.

#### C9.2.6 Damaged Stability, Option 2

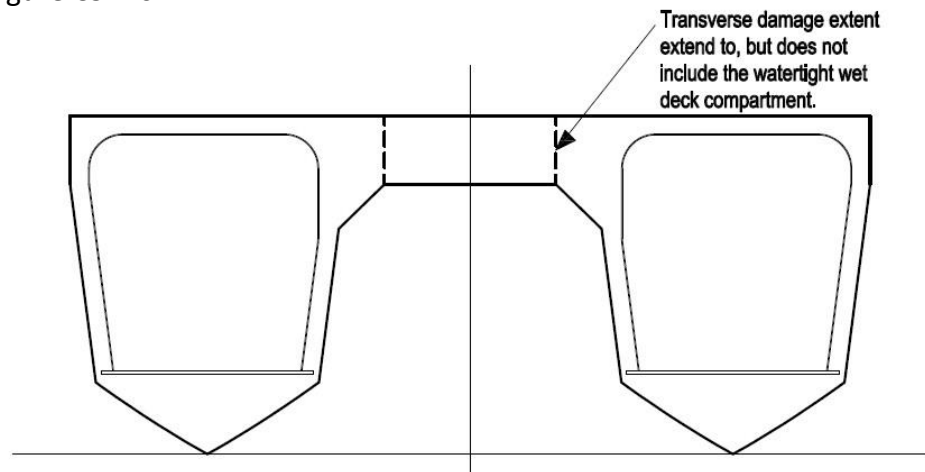
Damaged Stability should be calculated with any one compartment flooded. The extent of damage should be:

- i. A damage length of 10% Length should be considered in the calculations. Where the distance between two transverse watertight bulkheads is less than the damage length, one or more bulkheads should be disregarded in the damage stability calculations, such that the compartment length considered is equal or above the damage length. The damage length given above need not be applied within the forepeak and aftpeak compartment/s.
- ii. The transverse extent of damage should be up to and including the centreline of the vessel. A catamaran need only be considered to have damaged the full extent of 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 C9.2.6. Trimarans should be considered to have damaged wing and centre compartments up to the centre line of the vessel.
- iii. The vertical extent of damage should be taken for the full vertical extent of the vessel, and
- iv. The shape of the damage should be assumed to be a rectangular block.

Watertight compartments aft of the transom that do not form part of the hull length and do not extend below the design waterline (such as overhangs and appendages) need not be considered in the damaged length assessment.

If any damage of lesser extent than that required in C10.2.3 would result in a more severe condition, such damage shall be assumed.

Figure C9.2.6



- C9.2.7 Spaces that are normally occupied at sea are to be provided with at least two independent means of escape preferably at opposite sides / ends of the superstructure that allow positive freeboard independent of its location.
- C9.2.8 Any weathertight doors or openings leading from undamaged spaces, that are normally occupied at sea, to the weatherdeck should be regarded as downflooding points for the purposes of the damage stability calculation.
- C9.2.9 A damage scenario which considers damage to all the forward compartments of each hull of a multihull that fall within 5% L from the forward extremity of the watertight hull measured on vessel centreline shall be assessed to ensure that these do not result in a more onerous damaged stability condition.
- C9.2.10 In the damaged condition, the residual stability and damaged waterline should be such that:
- the angle of equilibrium (combined heel and trim) does not exceed  $15^\circ$  from the upright, sufficient non-slip deck surfaces and suitable holding points eg rails, grab bars etc, are provided along escape routes and accessing escape routes. Additionally, practical consideration should be given to the means of accessing, launching and embarking liferafts;
  - the resulting righting lever curve has a range to the downflooding angle of at least  $20^\circ$  beyond the angle of equilibrium;
  - the maximum righting lever within that range is not less than 200mm;
  - the area under the curve is not less than 0.045m radians;
  - the final equilibrium waterline should be below the lowest point of any opening which is not closed by an approved watertight

- closure. This includes air pipes, hatch covers, doors and any other weathertight closure;
- vi. this damage should not cause the vessel to float at a waterline less than 75mm from the weatherdeck. This may be relaxed on application to the Administration, provided that all of the following are met:
- a. the immersed portion of the weather deck is not a lifesaving 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 300mm.

### **C9.3 Intact stability: vessels requiring a stability information booklet (see C9.1.2)**

- C9.3.1 The lightship weight, vertical centre of gravity (KG) and longitudinal centre of gravity (LCG) of a monohull vessel should be determined from the results of an inclining experiment. Guidelines for the procedure on carrying out of an inclining experiment can be found in the Instructions for the Guidance of Surveyors on Load Line (MSIS 1), Part 6<sup>6</sup>.
- C9.3.2 An inclining experiment may not produce satisfactory results for vessels such as multihulls where the VCG is less than one third of the GM over the range of standard operating conditions. In such cases the LCG should be obtained by displacement check or by weighing with two gauges (eg one fore and one aft). The lightship VCG may be obtained by an accurate weight estimate calculation with a suitable margin added, in no case should the lightship VCG be taken below main deck level. Details of the estimated lightship weight, LCG and VCG should be submitted to the Certifying Authority at an early stage for verification.
- C9.3.3 The lightship weight may include a margin for growth, up to 5% of the lightship weight at the discretion of the Certifying Authority,

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<sup>6</sup> [http://www.dft.gov.uk/mca/mcga07-home/shipsandcargoes/mcgashipsregsandguidance/mcga-dqs-ss\\_guidance\\_to\\_surveyors.htm](http://www.dft.gov.uk/mca/mcga07-home/shipsandcargoes/mcgashipsregsandguidance/mcga-dqs-ss_guidance_to_surveyors.htm)



positioned at the LCG and vertical centre of the weather deck amidships or the lightship KG, whichever is higher. (The lightweight margin should not be used in practice to increase maximum cargo-deadweight.)

- C9.3.4 Curves of static stability (GZ curves) should be produced for:-
- i. Loaded departure, 100% consumables;
  - ii. Loaded arrival, 10% consumables;
  - iii. Anticipated service conditions; and
  - iv. Conditions involving lifting appliances (when appropriate).
- C9.3.5 In addition, where the vessel is approved to carry cargo more than 1,000kg, simplified stability information in the form of Maximum KG data should be provided, including a worked example to illustrate its use.
- C9.3.6 Maximum free surface moments should be included within the Loaded Departure condition, and as a minimum, factored according to tank percentage fill for all other conditions.
- C9.3.7 Generally, buoyant structures intended to increase the range of positive stability should not be provided by fixtures to Superstructures, deckhouse, masts or rigging.
- C9.3.8 The curves of static stability for the loaded conditions should meet the following criteria:
- i. the area under the righting lever curve (GZ curve) should be not less than 0.055m radians up to 30° angle of heel and not less than 0.09m radians up to 40° angle of heel or the angle of downflooding if this angle is less;
  - ii. the area under the GZ curve between the angles of heel of 30° and 40° or between 30° and the angle of downflooding if this less than 40°, should be not less than 0.03m radians;
  - iii. the righting lever (GZ) should be at least 0.20m at an angle of heel equal to or greater than 30°;
  - iv. the maximum GZ should occur at an angle of heel of not less than 25°; and
  - v. after correction for free surface effects, the initial metacentric height (GM) should not be less than 0.35m.
- C9.3.9 If a vessel with broad beam in relation to depth, such as a catamaran or multihull type does not meet the stability criteria given in Section C9.3.8, the vessel should meet the following criteria:-

- i. the area under the righting lever curve (GZ Curve) should not be less than 0.085m radians up to  $\theta_{GZmax}$  when  $\theta_{GZmax} =$

15° and 0.055m radians up to  $\theta_{GZmax}$  when  $\theta_{GZmax} = 30^\circ$ .

When the maximum righting lever,  $GZ_{max}$ , occurs between  $\theta = 15^\circ$  and  $\theta = 30^\circ$  the required area under the GZ Curve up to  $\theta_{GZmax}$  should not be less than:

$$A = 0.055 + 0.002(30^\circ - \theta_{GZmax}) \text{ metre-radians}$$

where:  $\theta_{GZmax}$  is the angle of heel in degrees at which the righting lever curve reaches its maximum.

- ii. the area under the righting lever curve between  $\theta = 30^\circ$  and  $\theta = 40^\circ$  or between  $\theta = 30^\circ$  and the angle of downflooding  $\theta_f$ , if this angle is less than  $40^\circ$ , should not be less than 0.03m radians;
- iii. the righting lever  $GZ$  should not be less than 0.2m at an angle of heel of  $30^\circ$ ;
- iv. the maximum righting lever should occur at an angle not less than  $15^\circ$ ; and
- v. the initial metacentric height  $GMO$  should not be less than 0.35m.

C9.3.10 Barges or pontoons with the following characteristics may use the stability criteria below (taken from the IMO International Code of Intact Stability, 2008) in lieu of either C9.3.8 or C9.3.9:

- i. Vessel is non self-propelled; and
- ii. Vessel is un-manned; and
- iii. Vessel is carrying deck cargo only; and
- iv. Vessel had a block coefficient of 0.9 or greater; and
- v. Vessel has a breadth to depth ratio of more than 3; and
- vi. Vessel has no hatchways in the deck except small manholes closed with gasketed covers.

Criteria:

- a. The area under the righting lever curve up to the angle of maximum righting lever should not be less than 0.08m radians.
- b. The static angle of heel due to a uniformly distributed wind load of 540 Pa (wind speed 30 m/s) should not exceed an angle corresponding to half the freeboard for the relevant loading condition, where the lever of the wind heeling moment is measured from the centroid of the windage area to half the draft.

c. The maximum range of stability should be at least 20°.

- C9.3.11 For any newly built vessel with known differences from a sister vessel, a detailed weights and centres calculation to adjust the lead vessel's lightship properties should be carried out. The lightship properties for the new vessel may be assessed by carrying out a lightweight check. The deviation in lightship displacement should not exceed 2% of the lightship displacement of the sister vessel. In addition, the deviation in lightship LCG should not exceed 1% of the LBP of the sister vessel LCG. Where the deviation is within these limits the actual lightship weight and LCG derived from the lightship check should be used in conjunction with the higher of either the lead vessel's VCG or the calculated value.
- C9.3.12 Subject to the agreement of the Certifying Authority, the requirement for an inclining test may be dispensed with in cases where the margins on intact and damage stability are sufficient to permit minor changes in VCG, eg a minimum of 10% margin on intact and damage stability criteria requirements, and the weight difference can be accurately assessed to the satisfaction of the Certifying Authority.
- C9.3.13 Where the deviation exceeds either of these limits, an inclining test should be carried out.
- C9.3.14 A sister vessel is defined as a ship built under the survey of a Certifying Authority, by the same yard from the same plans and within five years of the new vessel.

#### **C9.4 Intact stability: vessels complying with simplified stability assessment (see C9.1.3)**

- C9.4.1 A vessel should be tested in the fully loaded conditions (which should correspond to the freeboard assigned) to ascertain the angle of heel and the position of the waterline which results when all persons which the vessel is to be certificated to carry are assembled along one side of the vessel (the helmsman may be assumed to be at the helm). Each person may be substituted by a mass of 82.5kg for the purpose of the test.

C9.4.2 The vessel will be judged to have an acceptable standard of stability if the test shows that:

- i. the angle of heel does not exceed 7° and in the case of a vessel with a watertight weather deck extending from stem to stern, as described in Section C1.1.1, the freeboard to deck is not less than 75mm at any point; or
- ii. if unable to meet the criteria in C9.4.2 (i.) the angle of heel may exceed 7°, but should not exceed 10°, if the freeboard in the heeled condition is in accordance with that required by Section C10.0 in the upright condition.

C9.4.3 Additionally for vessels over 15m in length the heeling moment applied during the test described in C9.4.1 should be calculated using the formula below. The vessel should attain a value of initial GM not less than 0.5m if using an estimated displacement or 0.35m if the displacement of the vessel is known and can be verified by the Certifying Authority.

- i. Where displacement of the vessel is known and can be verified:

$$GM = \frac{57.3 \times HM}{\theta \times \Delta}$$

where HM = No. of persons x weight per person (kg) x distance from CL (m)

θ = heel angle (degrees) obtained from the test defined in C9.4.1 and C9.4.2

Δ = full displacement including passengers, crew, equipment and cargo (kg)

GM must exceed 0.35m

Note: Weight per person must be taken as no less than 82.5kg

Cargo weight must not exceed 1,000 kg

- ii. Where displacement of the vessel is estimated:

where HM = No. of persons x weight per person (kg) x distance from CL (m)

θ = heel angle (degrees) obtained from the test defined in C9.4.1 and C9.4.2

Δ = full displacement including passengers, crew, equipment & cargo (kg)

Δ = CB x LOA x Moulded Beam x Load Draught x 1.025

The Certifying Authority is to approve the value of CB used; in the case of doubt CB of 0.9 can be used (for pontoons etc) or 0.67 for others. GM must exceed 0.50m

Note: Weight per person must be taken as no less than 82.5kg  
Cargo weight must not exceed 1,000 kg

- C9.4.4 For vessels carrying a combination of passengers, activity related equipment and cargo, for which the cargo element does not exceed 1000kg (see definitions), the test defined in Section C9.4.1 should be carried out with the maximum permissible weight, and additionally with passenger weight only. For the purposes of these tests the cargo and activity related equipment may be assumed to be retained at its normal stowage position.
- C9.4.5 In all cases, the maximum permissible weight derived from the tests conducted should be recorded on the certificate. Vessel loading will be restricted by the position of the freeboard mark and the maximum permissible weight, and thus for the purposes of this test, attention should be paid to any activity related equipment where this may be significant, eg diving equipment.
- C9.4.6 Vessels complying with ISO 12217 Part 1 'Small craft - Stability and buoyancy assessment and categorisation - Non-sailing boats of hull length greater than or equal to 6 metres', assessed using any Option of Section 5.3 - Test and calculations to be applied', may as an alternative, after verification of the stability assessment by the Certifying Authority, be assigned an area of operation in accordance with the following Table C9.4.6:

Table C9.4.6

Permitted Area of Operation	Code Area Category	ISO 12217 Design Category
Up to 60 miles from a safe haven	2	B
Up to 20 miles from a safe haven	3	B
Up to 20 miles from a safe haven in favourable weather and daylight	4	C
Up to 3 miles of land and not more than 3 miles radius from either the point of departure or point of arrival in favourable weather	5	C
Up to 3 miles from a nominated departure Point and never more than 3 miles from land, in favourable weather and daylight	6	C

## **C9.5 Stability and survivability of open boats, inflatable boats, rigid inflatable boats or boats fitted with a buoyant collar**

- C9.5.1 These requirements apply to an open boat, inflatable boat, rigid inflatable boat or those vessels with a buoyant collar. Unless a boat to which the Code applies is completely in accordance with a standard production type, for which the Certifying Authority is provided with a certificate of approval for the tests which are detailed below, the tests required to be carried out on a boat floating in still water are shown below. In all cases, the maximum permissible weight derived from the tests conducted should be recorded on the certificate. Vessel loading will be restricted by the maximum permissible weight, and thus for the purposes of this test, attention should be paid to any activity related equipment where this may be significant, eg diving equipment.

## **C9.6 Stability tests**

- C9.6.1 The test should be carried out with all the vessel's equipment, fuel, cargo, activity related equipment (eg diving equipment) and number of persons for which it is to be certificated, on board. The engine, equipment and cargo may be replaced by an equivalent mass. Each person may be substituted by a mass of 82.5kg for the purpose of the tests.
- C9.6.2 The maximum number of persons for which a boat is certified should be crowded to one side, with half this number seated on the buoyancy tube/gunwale. This procedure should be repeated with the persons seated on the other side and at each end of the open boat, inflatable boat, rigid inflatable boat or vessel with a buoyant collar. For the purposes of these tests the cargo, or equivalent alternative mass, should be retained at its normal stowage position. In each case the freeboard to the top of the buoyancy tube/gunwale should be recorded. Under these conditions the freeboard should be positive around the entire periphery of the boat.

## **C9.7 Damage tests - inflatable boats**

- C9.7.1 The tests should be carried out with all of the vessel's equipment, fuel, cargo, activity related equipment (eg diving equipment) and the number of persons for which it is to be certificated, on board. The engine, equipment and cargo may be replaced by an equivalent mass. Each person may be substituted by a mass of 82.5kg for the purpose of the tests.

- C9.7.2 The tests will be successful if, for each condition of simulated damage, the persons for which the inflatable boat or rigid inflatable boat is to be certificated are supported within the inflatable boat or rigid inflatable boat. The conditions are:
- i. With forward buoyancy compartment deflated (both sides if appropriate);
  - ii. With the entire buoyancy compartment, from the centreline at the stem to the transom, on one side of the inflatable boat or rigid inflatable boat deflated.

## **C9.8 Swamp test**

- C9.8.1 It should be demonstrated by test or by calculation that a vessel, when fully swamped, is capable of supporting its full outfit of equipment, cargo and activity related equipment, the total number of persons and equivalent mass of cargo for which it is to be certificated, and a mass equivalent to its engine and a full tank of fuel, with a reserve of buoyancy of 10%.
- C9.8.2 In the swamped condition the open boat, inflatable boat, rigid inflatable boat or vessel with a buoyant collar, should not be seriously deformed.
- C9.8.3 An adequate means of draining the boat should be demonstrated at the conclusion of this test.

## **C9.9 Person recovery stability test**

- C9.9.1 Two persons should recover a third person from the water into the vessel. The third person should feign to be unconscious and be back towards the inflatable boat or rigid inflatable boat so as not to assist the rescuers. The third person should also, where the water temperature in the operating region requires it, wear suitable anti-exposure clothing (eg dry suit or immersion suit). Each person involved should wear an approved lifejacket. The vessel should remain stable throughout the operation, and should not capsize.

## **C9.10 Stability of vessels fitted with a deck crane or other lifting device**

- C9.10.1 For the purposes of Section C9.0 only, a lifting device does not include a person retrieval system, the vessel's own anchor handling equipment, or davits for tenders, where judged by the Certifying Authority not to have a detrimental effect on the stability of the vessel.

- C9.10.2 Reference should be made to Section C9.4 for requirements for safety standards other than stability for a vessel fitted with a deck crane or other lifting device.
- C9.10.3 A vessel fitted with a deck crane or other lifting device should be a decked vessel and comply with the general requirements of Section C9.0, which are appropriate to it.
- C9.10.4 In addition, with the vessel in the worst anticipated service condition for lifting operations, compliance with the following criteria should be demonstrated by a practical test or by calculations:
- i. With the crane or other lifting device operating at its maximum load moment, with respect to the vessel, the angle of heel generally should not exceed  $7^{\circ}$  or that angle of heel which results in a freeboard to deck edge anywhere on the periphery of the vessel of 250mm, whichever is the lesser angle (consideration should be given to the operating performance of cranes or other lifting devices of the variable load-radius type and the load moment with respect to the vessel for lifting devices situated off centreline).
  - ii. When an angle of heel greater than  $7^{\circ}$  but not exceeding  $10^{\circ}$  occurs, the Certifying Authority may accept the lifting condition providing that all the following criteria are satisfied when the crane or other lifting device is operating at its maximum load moment;
    - a. the range of stability from the angle of static equilibrium to downflooding or angle of vanishing stability, whichever is the lesser, is equal to or greater than  $20^{\circ}$ ;
    - b. the area under the curve of residual righting lever, up to  $40^{\circ}$  from the angle of static equilibrium or the downflooding angle, if this is less than  $40^{\circ}$ , is equal to or greater than 0.1m radians;
    - c. the minimum freeboard to deck edge at side, measured at A.P. and F.P. throughout the lifting operations should not be less than half the assigned freeboard to deck edge at side amidships. For vessels with less than 1000mm assigned freeboard to deck edge amidships the freeboard at A.P. or F.P. at deck edge should not be less than 500mm; and
    - d. the freeboard to deck edge anywhere on the periphery of the vessel is at least 250mm.
- C9.10.5 Information and instructions to the master on vessel safety when using a deck crane or other lifting device should be included in the Stability Information Booklet. The information and instructions should include:



- i. the maximum permitted load and outreach which satisfy the requirements of Section C9.10.4, or the Safe Working Load (SWL), whichever is the lesser (operating performance Data for a crane or other lifting device of variable load-radius type should be included as appropriate);
- ii. details of all openings leading below deck which should be secured weathertight; and
- iii. the need for all personnel to be above deck before lifting operations commence.

C9.10.6 Requirements for a lifting system which incorporates counterbalance weight(s), counter ballasting or a vessel that cannot comply with the requirements of Section C9.10.4 but is otherwise deemed to have adequate residual stability may be specially considered by the Administration.

C9.10.7 Vessels fitted with stern gantries or fitted with lifting devices over the vessel's side are not required to have a stability book provided it can be demonstrated to the satisfaction of the Certifying Authority that:

- i. The lifting device is not of a variable load radius type (eg knuckle boom crane), and
- ii. The SWL of the lifting device does not exceed 1% of the vessel's displacement. Where the displacement of the vessel is not known it may be estimated from the following formula:

$$\Delta = CB \times LOA \times Moulded \text{ Beam} \times Load \text{ Draught} \times 1.025$$

- iii. The Certifying Authority is to approve the value of CB used; in the case of doubt CB of 0.9 can be used (for pontoons etc) or 0.67 for others, and
- iv. A practical test has been conducted with the gantry/lifting device at the maximum rated load/radius which demonstrates the maximum heel angle of 7° and minimum heeled freeboard of 250mm around the periphery of the vessel are achieved.

## **C9.11 Stability of vessels engaged in towing**

C9.11.1 Vessels engaged in towing that are not required to have a stability information booklet and those that are required to have a stability information booklet should meet the requirements of this section.

C9.11.2 Generally, a vessel engaged in towing should be a decked and comply with the general requirements of Section C9.0 which are appropriate to the vessel.

C9.11.3 The danger to safety of deck edge immersion makes an open boat unsuitable for towing other vessels or floating objects. [Open boats may tow vessels of less than twice their displacement in harbour areas and in area categories 5 and 6, in favourable weather.]

C9.11.4 For vessels with stability information books, the book should include loading conditions for towing. Stability for towing conditions may be deemed satisfactory if the heeling lever (defined below) does not exceed 0.5 times the maximum GZ for the most critical loading condition.

Heeling Lever =

$$\frac{(0.6 \times \text{Max. Bollard Pull} \times \text{Vertical Distance between Hawser and Centre of the Propeller(s)})}{\text{Displacement}}$$

The height of the hawser should be measured at:

- the fixed gog, or the side rails if higher, if a fixed gog is always used;
- or
- the top of the winch drum (with no towline deployed), or the side rails if higher, if a fixed gog is not always used.

If the maximum GZ occurs at an angle greater than 30° of heel then the GZ value for 30° of heel should be used instead of the angle of maximum GZ.

C9.11.5 The stability of vessels without stability information books can be deemed satisfactory if -

- in the normal working condition, the freeboard is such that the deck edge is not immersed at an angle of less than 10°; and
- The results of the heel test indicate that -

$$\frac{wd}{LBT \rho \tan(\theta)} \geq \frac{0.076 K}{f}$$

Where:  $K = 1.524 + 0.08L - 0.45r$

$L$  = Length of vessel between perpendiculars (metres)  $r$  =

Length of radial arm of towing hook (metres)

$f$  = Freeboard (metres)

$\rho$  = Density of sea water

$\theta$  = Heel angle from heel test  
w = Weight moved for heel test  
d = transverse distance moved by weight for heel test.

- C9.11.6 The heel test should be carried out in small increments in both directions, and the average resultant heel angle noted for the average heeling moment wd.

## **C9.12 Approval and carriage of stability information**

- C9.12.1 A vessel not required to have an Approved Stability Information Booklet:
- i. A vessel for which stability is assessed on the basis of practical tests or simplified methods, defined in Section C9.0 of the Code, conducted by a competent person(s), should be approved by the Certifying Authority. In order to give approval, the Certifying Authority should be satisfied that the requirements have been met, accepting the results obtained and keeping a detailed record of the procedure of the tests or calculations and the results which were accepted.
  - ii. The Certifying Authority should retain the details in the records maintained for the vessel, and these details are to be entered on the certificate. See section C9.1.5 for requirements for the carriage of a Stability Guidance Booklet.
- C9.12.2 A vessel required to have an Approved Stability Information Booklet:
- i. The owner(s) should be responsible for the inclining test of a vessel to be undertaken by competent persons and for the calculation of the lightship particulars, which are used in the stability calculations.
  - ii. A person, independent of the owner/operator, competent to the satisfaction of the Certifying Authority should witness the inclining test of a vessel and be satisfied as to conditions and the manner in which the test is conducted.
  - iii. The owner(s) of a vessel should be responsible for the submission of the Stability Information Booklet, based on the Administration's model booklet prepared by a competent person(s), the content and form in which stability information is presented, its accuracy and its compliance with the requirements of Section C8.0 for the standard required for the vessel. The owner(s) should either submit three (3) hard copies of the booklet to the Certifying Authority for approval or an electronic copy as agreed with the Certifying Authority.

- iv. When satisfied with the form and content of the Stability Information Booklet (including satisfaction with the competency of the person(s) who produced the booklet, methods and procedures used for calculations, the stability standard achieved and instructions which may be given to the Master but excluding accuracy of hull form data), the Certifying Authority should stamp the booklet with an official stamp which contains the name of the Certifying Authority, the date of approval, a file (or record) reference, number of pages in the booklet and "APPROVED FORM AND CONTENT".
- v. Two (2) copies of the approved booklet should be returned to the owner(s). The owners should be instructed to confirm that one (1) copy has been placed on the vessel and will be retained on the vessel at all times for use by the Master. The second booklet is for the record of the owner(s).
- vi. The Certifying Authority should retain the third copy of the approved booklet in the records kept for the vessel.
- vii. it will be necessary to keep a hard copy of the approved Stability Information Booklet on board the vessel for use and reference, however any electronic stability software (which has been validated, to the satisfaction of the Certifying Authority, against the approved Stability Information Booklet) may additionally be used.

### **C9.13 A vessel required to have approved damage stability information**

- C9.13.1 The owner(s) of a vessel should be responsible for the submission of the damage stability calculations prepared by a competent person(s), their accuracy (including methods and procedures used for calculations) and compliance with the requirements of Section C9.2.

The owner(s) should submit two (2) copies of the calculations to the Certifying Authority for approval.

- C9.13.2 The Certifying Authority should approve the results of the damage stability cases provided that the results meet the standard defined in Section C9.2.

Approval (of the results but not the accuracy of the calculations) should be given in a formal letter from the Certifying Authority to the owner(s) and a copy of the calculations returned marked with the name of the Certifying Authority, the date and "RESULTS APPROVED".

## **C9.14    Guidance on stability assessment**

- C9.14.1    Guidelines on the minimum Form & Content of a stability book and guidance on minimum levels of checking for Certifying Authorities leading to approval are contained in Annex 8.
- C9.14.2    It should be noted that the Certifying Authority may require a full stability analysis for a vessel which has been modified from the original design, particularly if the freeboard has been significantly reduced or the modification has involved the addition of an item of equipment which may have caused the position of the vertical centre of gravity to be situated at a higher level than that intended by the designer.
- C9.14.3    A full assessment, as opposed to a form and content check (see Annex 8) may be requested by the Certifying Authority for any vessel where there is concern with regard to the vessel's stability.

## **C10.0 FREEBOARD AND FREEBOARD MARKING**

### **C10.1 General**

- C10.1.1 Section C10.2.2 defines the requirements for minimum freeboard for a motor vessel whose stability has not been assessed using ISO 12217 'Small craft - Stability and buoyancy assessment and categorisation' Part 1. Section 12.3 defines how the freeboard mark and deck line should be applied. Requirements for an inflatable boat or boat fitted with a buoyant collar, not requiring an approved Stability Information Booklet, are contained within Section C10.4.
- C10.1.2 It should be noted that vessels whose freeboard is determined using Section C10.2 which are not provided with an approved Stability Information Booklet are required to be marked with a freeboard mark or alternative. In such cases the loading of the vessel is governed by the maximum permissible weight, in accordance with Section C8.0, as identified on the vessel's certificate, or appropriate to the load test at which the heel test was conducted, or in the condition to which the ISO 12217 is assigned.

### **C10.2 Minimum freeboard**

- C10.2.1 The freeboard, for a motor vessel whose stability has not been assessed in conjunction with Section C9.4.6, should be not less than that determined by the following requirements:
- C10.2.2 The vessel should be operated and freeboard calculated at a normal trim.
- C10.2.3 Vessels which carry cargo or a combination of passengers and cargo for which the cargo element does not exceed 1000kg.

A vessel, other than an inflatable or rigid inflatable boat, when fully loaded with cargo and non-cargo deadweight items certificated to be carried (each person taken as 82.5kg) should be upright and;

- i. in the case of a vessel with a continuous watertight weather deck in accordance with Section C1.3.1, which is neither stepped or recessed or raised, have a freeboard measured down from the lowest point of the weather deck of not less than 300mm for vessels of 7m in length or under and not less than 750mm for vessels of 18m in length or over. For a vessel of intermediate length the freeboard should be determined by linear interpolation;

- ii. in the case of a vessel with a continuous watertight weather deck in accordance with Section C1.3.2, which may be stepped, recessed, or raised, have a freeboard measured down from the lowest point of the weather deck, of not less than 200mm for vessels of 7m in length or under and not less than 400mm for vessels of 18m in length or over. For a vessel of intermediate length the freeboard should be determined by linear interpolation. The raised portion(s) of the watertight weather deck should extend across the full breadth of the vessel and the average freeboard over the length of the vessel should comply with C10.2.3 (ii.) above for a vessel with a continuous watertight weather deck;
- iii. in the case of an open boat, have a clear height of side (ie the distance between the waterline and the lowest point of the gunwale<sup>7</sup>) of not less than 400mm for vessels of 7m in length or under and not less than 800mm for vessels of 18m in length or over. For a vessel of intermediate length the clear height should be determined by linear interpolation.

C10.2.4 Vessels which carry cargo or a combination of passengers and cargo for which the cargo element exceeds 1000kg.

C10.2.5 Freeboard should be assigned in accordance with the Merchant Shipping (Load Line) Regulations 1998 (SI 1998 No. 2241), as amended.

Such vessels should have a scale of draught marks marked clearly at the bow and stern.

C10.2.6 A vessel required to be provided with an approved Stability Information Booklet should be assigned a freeboard which corresponds to the draught of the vessel in sea water when fully loaded (each person taken as 82.5kg), but which in no case should be less than the freeboard required by Section C10.2.3 or C10.2.4, nor that corresponding to the scantling draught.

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<sup>7</sup> The clear height of the side should be measured to the top of the gunwale or capping or to the top of the wash strake if one is fitted above the capping.

## C10.3 Freeboard mark and loading

- C10.3.1 A vessel assigned a freeboard in accordance with Section C10.2.4 should be marked with a freeboard mark in accordance with the Merchant Shipping (Load Line) Regulations 1998 (SI 1998 No. 2241), as amended, and have a scale of draught marks marked clearly at the bow and stern, on both sides of the vessel. The longitudinal position of the draught marks, relative to the longitudinal datum for the hydrostatic data, should be recorded in the Stability Information Booklet, where provided.
- C10.3.2 Where it is considered that the addition of a scale of draught marks is neither practicable nor meaningful, for example, due to restricted loading variations, application for special consideration should be made to the Administration.
- C10.3.3 Additionally, where the line of the deck is not immediately discernible, a vessel should be provided with a deck line. The deck line and freeboard mark should be permanent and painted on a contrasting background.
- C10.3.4 The freeboard mark shall consist of a ring 300mm in outside diameter and 25mm wide, intersected by a horizontal line 450mm long and 25mm wide the upper edge of which passes through the centre of the ring. The top of the intersecting line should be positioned at the waterline corresponding to the assigned freeboard to deck edge amidships.
- C10.3.5 No mark should be applied for fresh water allowance.
- C10.3.6 The assigning letter marking on the bar of the ring and bar should be D on the left and T on the right when the MCA is the Certifying Authority. In the case of any other Certifying Authority, the assigning letters should be U on the left and K on the right.
- C10.3.7 The freeboard mark for a vessel required to be provided with an approved Stability Information Booklet, other than a vessel complying with Section C10.2.4 and for a vessel not required to be provided with an approved Stability Information Book, other than inflatable boats and boats fitted with a buoyant collar, should be a bar of 300mm in length and 25mm in depth.
- C10.3.8 The marking should be permanent and painted black on a light background or in white or yellow on a dark background. No assigning letter marking should be placed on the bar marking.



- C10.3.9 The top of the mark should be positioned at the waterline corresponding to the draught referred to in Section C10.2.5, at amidships.
- C10.3.10 Additionally, where the line of the deck is not immediately discernible, a vessel should be provided with a deck line. The deck-line shall be marked amidships on each side of the vessel so as to indicate the position of the freeboard deck. The mark need not be of contrasting colour to the surrounding hull.
- C10.3.11 Where the design of the vessel, or other circumstances, render it impracticable to mark the deck line, the Certifying Authority may direct that it be marked by reference to another fixed point as near as practicable to the position described above.
- C10.3.12 A vessel should not operate in a condition which will result in its freeboard marks being totally submerged when it is at rest and upright in calm sea water.

#### **C10.4 Inflatable boats and boats fitted with a buoyant collar**

- C10.4.1 The freeboard of an inflatable boat or boat fitted with a buoyant collar should be not less than 300mm measured from the upper surface of the buoyancy tubes and not less than 250mm at the lowest part of the transom with all its equipment, fuel, cargo, activity related equipment (eg diving equipment) and the number of persons for which it is to be certificated on board, with the boat re-trimmed as necessary to represent a normal operating condition, and with the drainage socks, if fitted tied up.
- C10.4.2 A freeboard mark is not required, except where the vessel is certified to carry more than 1000kg of cargo in accordance with Section C10.2.4 when a load line is required.

## **C11.0 FIRE SAFETY**

### **C11.1 General**

- C11.1.1 The boundary of the engine space should, with special consideration given to fire flaps, be arranged to contain the fire extinguishing medium, ie the engine space should be capable of being closed down in order that the fire extinguishing medium cannot escape. Any fans located within, or feeding a machinery space, together with fuel and oil transfer pumps, centrifuges etc should be capable of being stopped from outside the space in the event of a fire. Systems comprising of automatic stopping of fans in the event of a fire should be supplemented with a manual override.
- C11.1.2 Where it is not practical to have a machinery space, the engine should be enclosed in a box. The box should perform the same function as the machinery space boundaries in Section C11.1.1 above.
- C11.1.3 Combustible materials and liquids should not be stowed in the engine space. If non-combustible materials are stowed in the engine space, they should be adequately secured against falling on machinery, and cause no obstruction to access to or from the space.
- C11.1.4 Portlights, windows or skylights should not be fitted in the boundary of the engine space, except that an observation port having a maximum diameter of 150mm may be fitted in an internal boundary bulkhead, provided that the port is of the non-opening type, the frame is constructed of steel or other equivalent material, and the port is fitted with a permanently attached cover with securing arrangements. Only fire rated toughened safety glass, rated A0 in accordance with the FTP Code, should be used in an observation port.
- C11.1.5 Linkages forming part of emergency means for the remote operation for flaps, cut-offs and similar devices, must be executed in materials or assemblies which will not themselves fail or become inoperable in all such emergency circumstances.

### **C11.2 Vessels Operating in Area Categories 0 and 1**

Vessels operating in area categories 0 and 1, and in any other area category where the total installed power exceeds 750kW per machinery space, or in any area category where the vessel is carrying 16 or more persons.

- C11.2.1 Steel Construction: Vessels which have their machinery space boundaries constructed of steel require no additional fire protection. However, surfaces on the opposite side of the machinery space should only be coated with finishes which have a Class 1 surface spread of flame rating. Also, due consideration should be given to insulation of steel machinery space boundaries where contiguous with accommodation, stores or other fire risk/sensitive spaces.
- C11.2.2 Fibre Reinforced Plastic (FRP) Construction: Machinery space boundaries should prevent the passage of smoke and flame for 15 minutes, when tested in accordance with the procedure shown in Annex 10. Fire resistance of FRP may be achieved by the use of woven roving glass layers or additives, which must be added strictly in accordance with the manufacturer's requirements, to the resin. Intumescent polyester, epoxy, vinyl ester or phenolic resin surface coatings may also be used; however, solvent borne intumescent paints are not acceptable. The Certifying Authority may waive the requirement for the test described in Annex 10 (Fire Test) if the construction complies with the equivalent standard provided by MGN 407.
- C11.2.3 MGN 407 may be used as an equivalent to the Annex 10 standard. Once the construction scantling is known it may be possible to select an insulation tested on another structure as per IMO A.754(18), on a worst case scenario, as per MGN 407. For instructions on this refer to sections 1 and 2 of MGN 407.
- C11.2.4 Aluminium and Wood Construction: Machinery space boundaries should have an equivalent level of fire protection when compared to FRP construction.
- C11.2.5 For multi-hull vessels with separate machinery spaces, each space can be considered separately in interpretation of total installed power provided that any common connecting service duct is fitted with a structural fire barrier to prevent the passage of smoke and flame in either direction for a period of 15 minutes.
- C11.2.6 Where insulation is fitted to provide an equivalent level of fire protection to that required in Section C11.2.2 or C11.2.3, the insulation need not be fitted lower than 300mm below the waterline. It should be noted that insulation approved by the Administration as satisfying the requirements of an A or B Class division for the construction material, and division scantlings, will exceed these requirements.

#### C11.2.7 Alternative Arrangements

Where it is not possible for the vessels described in C11.2.2 to meet the fire test prescribed in Annex 10, or those vessels described in C11.2.3 to meet an equivalent level of fire protection, such vessels may be fitted with insulation which provides an equivalent level of fire protection to the machinery space boundaries. Insulation that has been approved to meet A-15 standards [with steel] will be considered to meet this standard. The insulation need not be fitted lower than 300mm below the light waterline on hull sides.

### C11.3 Insulation

- C11.3.1 Thermal or acoustic insulation fitted inside the engine space should be of non-combustible material.
- C11.3.2 The thermal or acoustic insulation will be considered as being a non-combustible material if it complies with BS EN ISO 4589 Part 3, and the material has an Oxygen Index greater than 21, or if it fulfils the requirements of Appendix 10 or the IMO International Code for application of Fire Test Procedures (FTP Code), Part 1, Non Combustibility Test.
- C11.3.3 Insulation should be protected against impregnation by flammable vapours and liquids. Where insulation is cut, the edges should be protected against such impregnation, eg by the use of non-combustible tape. Where the insulation is vulnerable to damage it should be protected.

### C11.4 Cleanliness and pollution prevention

- C11.4.1 Provision should be made to retain any oil leakage within the confines of the engine space.
- C11.4.2 In a vessel constructed of wood, measures should be taken to prevent absorption of oil into the structure.
- C11.4.3 When it is impracticable to fit a metal drip tray in way of the engine, the use of the engine bearers as a means of containment of the oil may be accepted when they are of sufficient height and have no limber holes. Provision should be made for the clearing of spillage and drainage collected in the engine space.

- C11.4.4 Efficient means should be provided to ensure that all residues of persistent oils are collected and retained on-board for discharge to collection facilities ashore.
- C11.4.5 The engine space should be kept clean and clear of oily waste, except when oily waste is kept in a dedicated stowage tank.
- C11.4.6 Where petrol engines are carried on board, reference should be made to Section C4.3

## **C11.5 Open flame appliances and gas installations**

- C11.5.1 Open flame gas appliances provided for cooking, heating or any other purposes, should comply with the requirements of EC Directive 90/396/EEC ("Council Directive of 20 June 1990 on the approximation of the laws of the Member States relating to appliances burning gaseous fuels"), so far as the requirements of the Directive apply to any particular appliance, and be suitable for marine use and installation in boats.
- C11.5.2 Installation of a gas appliance should be in accordance with a recognised standards or equivalent, and Appendix 5 - Gas Installations.
- C11.5.3 Materials which are in the vicinity of open flame cooking or heating appliances should be non-combustible, except that these materials may be faced with any surface finish having a Class 1 surface spread of flame rating when tested in accordance with a recognised standard.
- C11.5.4 Combustible materials, and other surfaces, which do not have a surface spread of flame rating, should not be left unprotected within the following distances of a standard cooker:
  - i. 400mm vertically above the cooker, for horizontal surfaces, when the vessel is upright;
  - ii. 125mm horizontally from the cooker, for vertical surfaces.
- C11.5.5 Curtains, or any other suspended textile materials, should not be fitted within 600mm of any open flame cooking, heating or other appliance.
- C11.5.6 With regard to Section C11.5.4 and C11.5.5 above, ISO 9094 will be considered as acceptable.

- C11.5.7 Where open flame cooking or heating appliances are installed in or adjacent to accommodation areas, efficient CO detector(s) should be fitted. It is strongly recommended that CO detection is provided in accommodation and other accessible spaces where there is a possibility of exhaust gas penetration in the event of an exhaust leak.
- C11.5.8 Newly installed gas installations should be inspected by a 'Gas Safe' qualified technician (or equivalent if outside the UK) and issued with a safety certificate. It is strongly recommended that such inspections are carried out annually on all gas Installations.

## **C11.6 Furnishing materials**

- C11.6.1 It is recommended that Combustion Modified High Resilient (CMHR) foams are used in upholstered furniture and mattresses.
- C11.6.2 Upholstery covering fabrics should satisfy the cigarette and butane flame tests of a recognised standard, see Annex 11, or equivalent.

## **C11.7 Fire detection**

- C11.7.1 In all vessels efficient fire detectors should be fitted in the engine space(s), galley areas and spaces containing open flame devices.
- C11.7.2 On any vessel, where an area is identified by the Certifying Authority as posing a fire risk to either passengers or crew (eg sleeping accommodation), fire detection equipment shall be installed to protect that area.
- C11.7.3 The fire detectors should be appropriate to the hazard identified and should give an audible warning that can be heard in the space concerned, and in the control position, when the vessel is in operation. Fire detectors in engine spaces should detect smoke and heat or flame.
- C11.7.4 Efficient fire detectors may be required in order to comply with Section C11.8.2.

## **C11.8 Means of escape**

- C11.8.1 Two means of escape should be provided in;
- i. accommodation spaces used for sleeping or rest; and
  - ii. other accommodation spaces affected by a fire risk; and

iii. machinery spaces affected by a fire risk except;

- a. those spaces visited only occasionally, or unmanned during normal operation, and where the single access gives ready escape, at all times, in the event of fire; or
- b. those spaces where any person entering, and moving about the space, is within 5m of the single entrance, at all times.

C11.8.2 The means of escape should be such that a single hazardous event will not cut-off both escape routes. Only in the exceptional case, such that the overall safety of the vessel would be diminished, should means of escape contrary to Section C11.8.1 (i.), C11.8.2 (ii.) or C11.8.3 (iii.) be accepted.

C11.8.3 In the exceptional case where a single means of escape from accommodation spaces is accepted, efficient fire detectors should be provided, as necessary, to give early warning of a fire emergency which could cut off that single means of escape. Such detection should be located in the escape route and also in the spaces of high fire risk eg machinery and galley as appropriate. The alarm should be clearly audible in the accommodation space with cabin door(s) closed and under normal maximum ambient noise conditions. Detection in galley areas should be by heat detectors sited as close as practicable to the potential source of fire.

C11.8.4 Means of escape should be clearly marked for their purpose on both sides, and the function of each escape route demonstrated by practical tests to the satisfaction of the Certifying Authority.

C11.8.5 When considering a means of escape, C2.2.4 should also be considered.

## **C12.0 FIRE APPLIANCES**

### **C12.1 General**

- C12.1.1 A vessel should be provided with efficient firefighting equipment in accordance with this Section. 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)<sup>8</sup>. All other fire appliances are to be maintained in accordance with the manufacturers' requirements.
- C12.1.2 Except where there is a risk of an electrical fire, portable carbon dioxide fire extinguishers should not be located or provided for use in accommodation spaces where the user or occupants may be affected by their use or leakage. Safety considerations should be given to the volume of carbon dioxide that could be released.

### **C12.2 Vessels less than 6m in length operating in area category 6**

- C12.2.1 In a vessel of less than 6m in length, which is not fitted, or is only partially fitted, with a watertight weather deck, and with no cooking appliances, a single extinguisher capable of discharging into the engine space is to be fitted. The extinguisher should be suitably sized for the engine space, but be a minimum of 34B.

### **C12.3 Vessels up to 8m in length not fitted with a substantial enclosure**

- C12.3.1 An open vessel, inflatable boat or boat with a buoyant collar, up to 8m in length, not fitted with a substantial enclosure, with no cooking appliances, should be fitted with a minimum of two fire extinguishers, each with a minimum rating of 5A/34B.

### **C12.4 Vessel less than 15m in length, and carrying 15 or fewer persons, not covered by section C12.2 or C12.3**

- C12.4.1 Vessels less than 15m in length, and carrying 15 or fewer persons, not covered by Sections C12.2 or C12.3 should carry;

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<sup>8</sup>MGN 276 (M+F) - "Maintenance of Portable Fire Extinguishers"



- i. one hand fire pump (outside engine space) or one power driven fire pump (outside engine space), with sea and hose connections, capable of delivering one jet of water to any part of the vessel through hose and nozzle, and one fire hose of adequate length, with a 10mm nozzle, and a suitable spray nozzle; or
- ii. one multi purpose fire extinguisher with a minimum fire rating of 13A/113B, or a number of smaller extinguishers, giving the equivalent fire rating, in addition to that required in C12.4.2 below.

C12.4.2 Not less than one multi-purpose fire extinguisher with a minimum fire rating of 5A/34B, provided at each exit from accommodation spaces to the open deck. In no case should there be less than two such extinguishers provided.

C12.4.3 At least two fire buckets with lanyards. Buckets may be of metal, plastic or canvas and should be suitable for their intended service.

C12.4.4 One fire blanket of a recognised standard, in the galley or cooking area, where a fire risk can be identified.

## **C12.5 Vessels of 15m or more in length, or carrying 16 or more persons**

C12.5.1 Vessels of 15m or more in length, or carrying 16 or more persons should carry;

- i. one hand fire pump (outside engine space) or one power driven fire pump (outside engine space), with sea and hose connections, capable of delivering one jet of water to any part of the vessel through hose and nozzle, and one fire hose of adequate length with a 10mm nozzle and a suitable spray nozzle; or
- ii. not less than two multi-purpose fire extinguishers to a recognised standard, each with a minimum fire rating of 13A/113B, or a number of smaller extinguishers giving the equivalent fire rating, in addition to that required in C12.5.2 below.

C12.5.2 Not less than two multi-purpose fire extinguishers, with a minimum fire rating of 13A/113B.

C12.5.3 At least two fire buckets with lanyards. Buckets may be of metal, plastic or canvas and should be suitable for their intended service.

- C12.5.4 One fire blanket in galley or cooking area, where a fire risk is identified.

## **C12.6 Provision for fire extinguishing in machinery spaces**

- C12.6.1 Fire extinguishing, suitable for the volume of the engine space, should be provided for vessels fitted with inboard engines. A person should not be required to enter the machinery space in order to extinguish a fire.

### **C12.6.2 Portable Fire Extinguishers**

- i. The means of compliance with C12.6.1 may consist of a portable extinguisher suitably sized for the space being protected and arranged to discharge into that space. An additional extinguisher or one of the multi-purpose fire extinguishers required in C12.2, C12.3, C12.4 or C12.5, can also be the extinguisher required for discharge into the engine space, providing it is a suitable type (B), and suitably sized and stowed in a location appropriate to its dual use.

### **C12.6.3 Fixed Fire Extinguishing Systems**

- i. When a fixed fire extinguishing system, which is not a portable extinguisher described in C12.6.2 (i.) is installed in a machinery space, it should be an MCA, or equivalent, approved type appropriate to the space to be protected, and be installed and maintained in accordance with the manufacturer's requirements.
- ii. The requirements for fixed fire extinguishing installations are detailed in the Merchant Shipping (Fire Protection - Small Ships) Regulations 1998 (SI 1998 No. 1011), as amended, and the "Fire Protection Arrangements" of the MCA Instructions for the Guidance of Surveyors"<sup>9</sup>, as amended. Further requirements for the installation of fixed firefighting systems can be found in MSN 1666 (M)<sup>10</sup>- "The Merchant Shipping (Fire Protection) Regulations 1998: Fixed fire detection alarm and extinguishing systems".

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<sup>9</sup> <http://www.dft.gov.uk/mca/msis012ch7rev1012.pdf>

<sup>10</sup> Amended by MSN 1733 (M) - "The Merchant Shipping (Fire Protection) (Amendment) Regulations 1999".

- iii. Fixed installations in machinery spaces covered by the references are:
  - a. medium expansion foam;
  - b. high expansion foam;
  - c. carbon dioxide<sup>11</sup>;
  - d. pressure water spraying;
  - e. vaporising fluids (hydrofluorocarbons - HFCs); and aerosols (solid pyrotechnic type).

## **C12.7 Informative notes**

- C12.7.1 Multi-purpose fire extinguishers have a capability to deal with both Category A fires involving solid materials, and Category B fires involving liquids or liquefiable solids, and may be marked with the multipurpose rating, eg 13A/113B in Section C12.4.1 above; and 5A/34B in Section C12.4.2 above.
- C12.7.2 BS EN 3 is the accepted national standard for portable fire extinguishers.
- C12.7.3 BS EN 3 allows a zone of colour of up to 5% of the external area of the extinguisher body to be used to identify the extinguishing agent. Manufacturers have complied with this by printing the operating instructions in the appropriate extinguishing agent colour.
- C12.7.4 Manufacturers producing extinguishers certified and marked to BS EN 3 cannot revert to the colour schemes contained in the withdrawn BS 5423:1987. Owners of vessels must not overpaint red BS EN 3 extinguishers to the “old” colours.

## **C12.3 Cargo Carrying**

- C12.3.1 When a vessel is engaged in carrying cargo all such cargo should be stowed and secured in a manner which will not adversely affect the safe operation of the vessel.
- C12.3.2 Particular attention should be paid to the means for supporting and securing the cargo and the strength of securing points, the free drainage of water from cargo stowed on open deck, safe access in way of cargo stows and unobstructed visibility from the wheelhouse.
- C12.3.3 Cargo hatchways to dry cargo holds or spaces should be of an efficient weathertight construction.

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<sup>11</sup> MGN 354 (M+F) - “Fishing and Small Vessels - Safe Operation of Fixed CO<sub>2</sub> Gas Fire Extinguishing Systems” provides further guidance.

- i. In general, a cargo hatch coaming should be not less than 760mm in height. Hatch covers and coamings should be designed to withstand (without permanent deformation) a hydrostatic load of not less than 1.5 tonnes/metre<sup>2</sup> overall and associated buckling stress, and be fitted with efficient means to be closed and secured weathertight to the coaming. In any case, the coaming and hatch cover should be sufficiently strong to withstand the hydrostatic loading and/or the loading due to cargo stowed on the hatch cover, whichever loading is limiting.
- ii. Proposals for a cargo hatchway with a reduced coaming height or a flush hatch should be subject to special consideration by the Certifying Authority.

C12.3.4 Special consideration should be given to the securing of cargo on vessels that operate at high speed due to vessel accelerations.

#### **C12.4 Vessels fitted with a deck crane or other lifting device**

C12.4.1 Reference should be made to Section C9.10 for requirements for safety standards for vessel stability during lifting operations.

C12.4.2 Generally, a vessel fitted with a deck crane or other lifting device which will be used when the vessel is at sea should be a decked vessel with a watertight weather deck in accordance with Section C1.1.1 and C1.3.1. or be considered under Section C1.1.4.

C12.4.3 Agreement should be obtained from the Administration for any proposal to fit a deck crane or other lifting device on a vessel which is not a decked vessel.

C12.4.4 The Merchant Shipping (Lifting Operations and Lifting Equipment) Regulations 2006 (SI 2006 No. 2184), as amended apply to lifting equipment and its operation. The guidance is general in nature; employers should give more detailed consideration to the various aspects of their specific operations and take appropriate measures to safeguard health and safety. Further guidance can be found in MGN 332 (M+F)<sup>12</sup>. This Code does not aim to replicate those regulations or guidance and it is the responsibility of the employer to ensure that they are in compliance with them.

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<sup>12</sup> MGN 332 (M+F) - "The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006". .

- C12.4.5 The vessel's structure, the crane or other lifting device and the supporting structure should be of sufficient strength to withstand the loads that will be imposed when operating at its maximum overturning moment and maximum vertical reaction.
- C12.4.6 Load tests and inspections to verify the safe operation of the crane or other lifting device, its foundation and supporting structures should be carried out to the satisfaction of the competent person in accordance with LOLER<sup>13</sup>. Tests should be conducted in accordance with a recognised standard for the installation. Such tests should be repeated after modifications, including any structural modifications, take place. A visual inspection of the crane or lifting device should be carried out annually.
- C12.4.7 Typically, the crane or other lifting device should be subjected to a 25% overload test. (In special circumstances a reduced overload may have to be accepted but in no case should this be less than 10 %.) During the overload test, the hoist, slew and luff performance should be tested at low speed, as appropriate. Tests for a variable load-radius type of crane or other lifting device should correspond to its rated performance (eg load radius chart).
- C12.4.8 Attention is drawn to the requirements of BS 7121-2:2013 - Code of Practice for Safe Use of Cranes. Inspection, Testing and Examination, parts of which have particular relevance to vessels certificated in accordance with this Code.
- C12.4.9 An inclinometer or other efficient device to display heel angle should be provided on board for guidance to the crane or lifting device operator when controlling the lifting of items of unknown weight.
- C12.4.10 A prominent clear notice should be posted on or near the crane or lifting device and contain the following information and instructions:-
- i. the maximum permitted load and outreach which satisfy the requirements of Section C9.10.4, or the safe working load(SWL), whichever is the lesser (operating performance data, ie load radius performance chart for a crane or other lifting device of variable load-radius type should be included as appropriate);
  - ii. any crane whose safe working load varies with its operating radius is provided with a means of accurately determining the radius at any time, clearly visible or accessible to the driver of the crane, showing the radius of the load lifting attachments at

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<sup>13</sup> MGN 332 (M+F) - "The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006.

- any time. Provision should be made to enable the driver to ascertain the safe working load corresponding to that radius;
- iii. details of all openings leading below deck which should be secured weathertight; and
  - iv. instructions for all personnel to be above deck before lifting operations commence.
- C12.4.11 A lifting system which incorporates counterbalance weight(s) should be specially considered through the Certifying Authority by the MCA.
- C12.4.12 The Certifying Authority should be satisfied that the safety of the vessel is not endangered by lifting operations. Means should be provided for the efficient securing of cargo and loose equipment on board during lifting operations. Instructions on safety procedures to be followed by the skipper should be provided to the satisfaction of the Certifying Authority.
- C12.4.13 Where mobile cranes are operated on board a workboat (eg on the deck of a barge), special consideration should be given to worst case scenarios with regard to stability, structural strength of deck and safe limits of the deck operating area.

## ANNEX 1 - MANNING MATRIX

### Introduction

This matrix is designed to calculate the minimum number of crew required to handle a commercial vessel effectively and deal with any emergency situation on that vessel.

Additional staff will be required to ensure the safety of passengers in certain circumstances, including vessels holding functions on board 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.

The minimum number of crew calculated by this matrix is the total for the intended voyage. This shall include the Boatmaster and Boat Engineer if required by section A9.0 of this Code.

### Contributing Factors

The matrix considers the following factors when determining the appropriate number of crew for a passenger vessel. 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.

### Area of Operation

This will affect the availability of rescue services, and the availability of assistance from other vessels.

Area Category 6	To sea, within 3 miles of a nominated departure point(s) named in the certificate and never more than 3 miles from land, in favourable weather and daylight
Area Category 5	To sea, never more than 3 miles from land, in favourable weather
Area Category 4	Up to 20 miles from a safe haven, in favourable weather and in daylight
Area Category 3	Up to 20 miles from a safe haven
Area Category 2	Up to 60 miles from a safe haven
Area Category 1	Up to 150 miles from a safe haven
Area Category 0	Unrestricted service

### **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 vessel.

### **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 vessels 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 vessel 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 vessel in the correct manner. Only the liferafts needed to carry the total persons on board need be counted for establishing the weighting for LSA: the additional raft required in the event of “any one raft being lost or rendered unserviceable” need not be counted.

### **Firefighting**

In the event of a fire the number of crew required to operate equipment, availability of fixed systems and handling of pumps and hoses etc.

### **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.



## **Use of the Matrix**

In order to achieve a minimum manning level for a particular vessel, the table below needs to be consulted using the following procedure:

- i. Work down the table, matching each variable to applicable weightings.
- ii. Total up the weightings for each of the variables.
- iii. Use the sum of all the weightings in the index table to achieve the proposed minimum crew numbers required. This number shall include the Master.

Vessels which have varying manning modes of operation due to additional risks involved eg day/night or passenger numbers shall be calculated separately for each mode.

Matrix Table

VARIABLE	WEIGHTING	
<b>Number of Passengers</b>	<b>Passenger Numbers</b>	<b>Weighting</b>
	<13	0
	13-60	16
	61-100	20
	101-150	28
	151-200	36
	201-250	44
<b>Geographical Areas</b>	<b>Area of Operation</b>	<b>Weighting</b>
	Area 6	4
	Area 5	8
	Area 4	12
	Area 3	20
	Area 2	24
	Area 1	36
	Area 0	40
<b>Survivability</b>	<b>Type</b>	<b>Weighting</b>
	2 compartment	8
	1 compartment	16
	Buoyancy test	20
<b>Day/Night Operation</b>	<b>Time</b>	<b>Weighting</b>
	Day	8
	Night	20
<b>Functions</b>		<b>Weighting</b>
	No	0
	Yes	20
<b>LSA</b>	<b>Liferafts</b>	<b>Weighting</b>
	1	4
	2	8
	3	12
	4	16
	5	20
	6	24
	>7	Refer to MCA
<b>Number of Passenger Decks</b>	<b>Decks</b>	<b>Weighting</b>
	1	4
	2	8
	3	12

The resultant index for individual vessels is translated into the number of crew as follows:-

<b>Index</b>	<b>Number of Crew</b>
48 and under	1
49 – 77	2
78-98	3
99-110	4
111-130	5
131 and over	6

## ANNEX 2 - BOATMASTER LICENCE SYLLABUS

### Syllabus Requirements

The syllabus below will be modified by the Examiner to take into account the equipment on board the vessel.

Syllabus Content				2	1
<b>A.</b>	<b>PRACTICAL TEST</b> (This test should take place on a vessel of a type for which the applicant is requiring a licence)				
	1	<i>Boat Handling</i>			
		.1	Berthing and unberthing	Y	Y
		.2	Coming to and weighing anchor	Y	Y
		.3	Make fast to and leaving a buoy	Y	Y
		.4	Boat manoeuvring in confined waters	Y	Y
		.5	Turning short round	Y	Y
		.6	Knowledge and effect of transverse thrust	Y	Y
		.7	Steering a compass course and taking a rough bearing	Y	Y
		.8	Practical demonstration on the use of VHF on board the applicant's vessel. The holder must have knowledge of procedures used in radio telephone (VHF) communications, particularly with respect to distress, urgency, safety and navigational messages and of the adverse effect of misuse of such equipment.	Y	Y
<b>B.</b>	<b>ORAL EXAMINATION</b>				
	1	<i>Emergency Situations</i>			
		.1	Recovery of man overboard	Y	Y
		.2	Loss of engines	Y	Y
		.3	Loss of steering ability	Y	Y
		.4	Action to take in the event of collision	Y	Y
		.5	Grounding	Y	Y
		.6	Accident to seafarer or passenger	Y	Y
		.7	Use of extinguishing applicants	Y	Y
		.8	Use of lifesaving appliances	Y	Y
		.9	Search and rescue techniques in bad weather or reduced visibility	Y	Y
		.10	Choosing an appropriate area for beaching	Y	Y

Syllabus Content				2	1
B.	ORAL EXAMINATION (continued)				
	2	<i>Regulations for Preventing Collisions at Sea</i>			
	.1	A practical knowledge of the Rule of the Road as appropriate to the area of operation	Y	Y	
	.2	A full knowledge of the Regulations	Y	Y	
	.3	Keeping a good lookout	Y	Y	
	.4	Keep of a Deck Log	Y	Y	
	3	<i>Local Knowledge and Regulations</i>			
	.1	Actions to be taken in the event of injury or loss of life to a Seafarer	Y	Y	
	.2	Certification required by the vessel	Y	Y	
	.3	Limits as to vessel operation	Y	Y	
	4	<i>Seamanship</i>			
	.1	Common nautical terms	Y	Y	
	.2	Interaction with other vessels	Y	Y	
	.3	The effect of wind and tide on the manoeuvrability	Y	Y	
	.4	Securing and stowage of anchors and cable	Y	Y	
	.5	Selection of a proper anchorage	Y	Y	
	.6	The importance of navigating at reduced speed to avoid damage caused by own vessels bow or stern wave	Y	Y	
	.7	The difference in handling of single screw and twin screw boats	Y	Y	
	5	<i>Chart work</i>			
	.1	The meaning of common chart symbols	Y	Y	
	.2	The use of Tidal Diamonds	Y	Y	
	.3	Position fixing	Y	Y	
	.4	Courses to steer allowing for current and leeway	Y	Y	
	.5	Familiarity with the use of parallel rules, dividers, compasses, etc	Y	Y	
	6	<i>Lifesaving and Fire-Fighting Appliances</i>			
	.1	A knowledge of the statutory requirements and appreciation of the fact that the person in charge of a vessel must be satisfied that the lifesaving and fire-fighting appliances are properly maintained	Y	Y	
	.2	Use and deployment of inflatable liferafts and inflatable or rescue boats	Y	Y	
	.3	Inflatable liferaft and boat servicing requirements	Y	Y	
	.4	Hydrostatic release units	Y	Y	
	.5	Maintenance and care of buoyant apparatus	Y	Y	

Syllabus Content			2	1
<b>B.</b>	<b>ORAL EXAMINATION (continued)</b>			
	7	<i>Distress Signals</i>		
	.1	A knowledge of the contents of Annex IV of the Collision Regulations and the operation of the signals and equipment required to be carried in the applicant's vessel	Y	Y
	.2	Coastguard response to distress signals	Y	Y
	8	<i>Passenger Safety</i>		
	.1	Safety announcements	Y	Y
	.2	Disposition of passengers and seafarers to ensure stability and trim	Y	Y
	.3	Passenger numbers and reporting systems	Y	Y
	.4	Knowledge of emergency instructions and methods of orderly evacuation following any emergency, having regard to the size of the vessel concerned and its operational area	Y	Y
	.5	Ability to demonstrate to passengers the use of personal lifesaving appliances	Y	Y
	9	<i>Legal Responsibilities Towards Passengers and Seafarers</i>		
	.1	Safe access	Y	Y
	.2	Safe working practices	Y	Y
	.3	SCV Safety Certificate and regulations relating thereto	Y	Y
	.4	Code Compliance and Code Compliance Passenger Certificates	Y	Y
	10	<i>Weather</i>		
	.1	Sources of information	Y	Y
	.2	Local conditions and effects	Y	Y
	.3	Signs of approaching bad weather	Y	Y
	11	<i>Engineering Knowledge</i>		
	.1	Basic knowledge of day to day engine and battery checks	Y	Y
	.2	Knowledge of the servicing and routine maintenance of propulsion and auxiliary machinery	Y	Y
	.3	Knowledge of safety and shut off devices	Y	Y
	.4	Basic knowledge of running checks	Y	Y
	.5	Methods of fault detection, correction and emergency repairs	Y	Y

Syllabus Content			2	1
<b>B.</b>	<b>ORAL EXAMINATION (continued)</b>			
	12	<i>Publications</i>		
	.1	Merchant Shipping Notices (as applicable)	Y	Y
	.2	Regulations (as applicable)	Y	Y
	13	<i>Prevention of Pollution</i>		
	.1	A general appreciation of pollution prevention	Y	Y
	.2	Knowledge of the factors contributing to and precautions to be observed to prevent marine pollution when pumping out bilges and particularly when changing lubricating oil	Y	Y
	.3	Knowledge that disposal into the sea of all plastics, including but not limited to, synthetic ropes, plastic sheeting and garbage bags etc, is prohibited	Y	Y
	14	<i>Electronic Aids to Navigation</i>		
	.1	Knowledge of the use of Radar, Echo Sounder and Satellite navigation or other position finding device fitted on board the applicant's vessel	Y	Y
	15	<i>Basic Knowledge of Vessel Construction and Stability</i>		
	.1	General ideas on vessel construction and on plans available on board the vessel where these are carried	Y	Y
	.2	Maintaining watertight sub-division	Y	Y
	.3	General pumping arrangements	Y	Y
	.4	General principles of vessel stability	Y	Y
	.5	Heeling/Listing forces and their causes	Y	Y
	.6	Application and effects of asymmetric loading	Y	Y
	.7	Overtight mooring	Y	Y
	.8	Equilibrium in the heeled/listing condition		Y
	.9	Effect of liquid free surface and its control	Y	Y
	.10	Cranes, their operation and safe operating limits		Y
	.11	Outline knowledge of freeboard and trim	Y	Y
	.12	The use of stability and hydrostatic data where provided		Y
	.13	Knowledge of the effect of severe wind and rolling in associated sea conditions, especially in following seas	Y	Y

Syllabus Content			2	1
<b>C.</b>	<b>PRACTICAL SAIL BOAT TEST</b> (This test is to take place on a vessel of a size for which the applicant is licenced.)			
	.1	Getting the boat away from a pier or wharf	Y	Y
	.2	Bring the boat alongside a pier or wharf	Y	Y
	.3	Securing to a pier or wharf	Y	Y
	.4	Manoeuvring the boat to pick up a man overboard	Y	Y
	.5	Manoeuvring the boat to pick up a mooring buoy or marker	Y	Y
	.6	Be able to change tack	Y	Y
	.7	Be able to sail to all points of the wind	Y	Y
	.8	Anchoring and retrieving anchor	Y	Y



## ANNEX 3 - BOAT ENGINEER LICENCE SYLLABUS

### Syllabus Requirements

The syllabus below will be modified by the Examiner to take into account the equipment on board the vessel.

Syllabus Content		
<b>A.</b>	<b>ORAL EXAMINATION</b>	
	1	<i>Compression Ignition Engine</i>
	.1	The general principles of the compression ignition engine c.f. spark ignition
	2	<i>Cycle of Operation and Constructional Details</i>
	.1	Engine cycles explained: Four Stroke and Two Stroke
	.2	The essential engine components identified and the acquisition of basic terminology
	.3	The meaning of engine terms such as: top dead centre, bottom dead centre, stroke, bore, swept volume, engine capacity, clearance volume, power, specific Fuel Oil Consumption (SFOC) and compression ratio
	.4	Engine configurations: in line and 'V' engine types, side and overhead camshafts engines
	.5	Engine performance data: interpretation of revs, torque and power curves; specific fuel oil consumption
	.6	Two and four stroke engines
	3	<i>The Fuel System</i>
	.1	The nature of diesel engine fuels; gas oils and DERV and their related origins. The importance of fuel cleanliness and the avoidance of water ingress. Explanation of the conditions which lead to microbiological contaminations. Risks and consequences of fuel leakage contaminating the lubricating oil
	.2	The fuel tank: filling, venting and isolating arrangements; the importance of weather tight sealing of filling cap. Adequacy of mounting and support arrangements and the importance of accurate indication of fuel contents
	.3	Fuel pre-filter and water coalescer/separator
	.4	Fuel lift pumps of diaphragm and plunger types

Syllabus Content			
A.	ORAL EXAMINATION (continued)		
		.5	Fine paper element filters
		.6	Fuel injection pumps: in line jerk type and distributor pumping action. Fuel metering: helical, groove and metering valve (DPA)
		.7	Common rail system
		.8	Fuel injectors and the importance of good atomisation to the clean and efficient running of the engine
		.9	Fuel system safety
		.10	The importance of maintaining an adequate reserve of fuel and the consequences of allowing the level to fall too low
		.11	Bleeding the fuel system
	4	<i>The Lubrication System</i>	
		.1	The nature of friction, the composition of bearing materials and the role of lubricating oil in minimising the former and dissipating the heat produced
		.2	The route of lubricating oil through the engine and the importance of maintaining oil at the correct level and in an adequate state of cleanliness
		.3	Lubricating oil pumps of gear and lobe types
		.4	Lubricating oil filters and the action of the pressure relief valve
	5	<i>Engine Electrical Systems</i>	
		.1	Batteries: Lead Acid, Lithium-ion and Alkaline, their materials of construction, the electro-chemical processes and the explosive dangers of Hydrogen gas
		.2	The rating of batteries: Ampere-hour and cold cranking capacity for engine starting duties and deep cycling requirements for ancillary loads such as navigation lights and domestic requirements
		.3	Basic appreciation of the battery discharge versus recharge relationship. Simple calculations to show the importance of maintaining batteries in an adequate state of charge
		.4	Twin battery installations and split charging arrangements
		.5	The ac generator (Alternator) and its drive belt checks and maintenance
		.6	Pre-engaged starter motors

Syllabus Content			
<b>A.</b>	<b>ORAL EXAMINATION (continued)</b>		
		.7	Engine stopping arrangements - manual and solenoid operated. Emergency stopping by obstructing the air intake or shutting off fuel supply
		.8	Cold starting aids
		.9	Basic circuit diagrams and engine instrumentation - sender units and their locations
		.10	Safety features in the electrical distribution system such as fuses and breakers and the importance of bonding/earthing
	6	<i>Power Transmission</i>	
		.1	Reduction/reverse gear boxes and plate clutches. Mechanical and hydraulic modes of operation
		.2	Control systems: Bowden cables and rods. Safety considerations
		.3	Propeller shafting and couplings. The importance of accurate alignment and engine mountings - both rigid and flexible
		.4	Stern tube bearings and sealing arrangements - both traditional packed glands and seals such as Deep Sea Seals
		.5	Introduction to the basics of propeller matching to hull speed and engine power and revolutions
	7	<i>Hull Fittings</i>	
		.1	The maintenance of sea cocks and the importance of annual inspection
		.2	Zinc anodes and Cathodic Protection systems and associated bonding circuits
	8	<i>General</i>	
		.1	Marine pollution prevention
		.2	Code of Safe Working Practices including entry into dangerous (enclosed) spaces, safety consciousness and awareness of potential fire hazards.
		.3	The use and hazards of fixed fire extinguishing systems
		.4	Basic rope-work
		.5	Vessel knowledge – common terms
		.6	Emergency procedures and duties – Fire, MOB, flood

**NOTE:**

**Fault finding and rectification will be covered within each part of the syllabus as the individual topics are covered.**

## ANNEX 4 - COMPETENT CREW LICENCE SYLLABUS

### Syllabus Requirements

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 Code Compliance Certificate/Code Compliance Passenger Vessel Certificate.

The syllabus below will be modified by the Examiner to take into account the equipment on board the vessel.

<b>SUBJECT</b>
<b>Vessel Specific Familiarisation Training Completed</b>
Location and use of Lifesaving Appliances
Knowledge of abandon vessel procedures
The difference between a lifejacket and buoyancy aid
The correct method of fitting a lifejacket and buoyancy aid
Man overboard procedures including deployment of lifebuoy and raising the alarm
Demonstrate knowledge of the location and use of lifesaving equipment carried on the vessel
Identify markings on liferafts (or other survival equipment) with regards to number of occupants
Location and use of Fire Fighting Appliances
Operation of alarm bells (if fitted)
Knowledge of vessel fire procedures
Under supervision, operation of fire pump and hoses
Knowledge of the location and use of firefighting equipment carried on the Vessel
Identify differing types of fire extinguisher and what type of fire each would be used on
Use of ancillary equipment as carried (foam applicators etc)
<b>Action in event of emergency</b>
Means of recovery of person(s) from the water
Action in the event of collision at operational level
Prepare a liferaft or other survival craft for launching
Man overboard procedures including dropping of lifebuoy and raising the alarm
Method used to indicate the vessel is in need of urgent assistance and to summon help

<b>SUBJECT</b>
<b>Personal safety and social responsibility</b>
Observe safe working practices
Comply with emergency procedures
Contribute to effective human relations on board
Take precautions to prevent pollution of the marine environment
Understand orders and be understood in relation to board duties
<b>Seamanship</b>
A working knowledge of nautical terms
Demonstrate knowledge of the general layout of the vessel
Knowledge of bends and hitches commonly used on board
Correct use of ropes and rigging of fenders
Handling, care and stowage of chains and anchors
Handling, care and use of mooring lines
Assist in opening, closing and securing of doors, ramps and other hatches and access ways
Understand safe means of access and be able to rig accordingly
Understand helm orders and be able to steer a course under direction
Understand the duties of lookout and the reporting of lights and objects
Basic understanding of the collision regulations (carriage of lights, shapes and sound signals)
<b>Responsibilities and Regulations</b>
Basic understanding of an employee's obligations
Reporting defects and mechanical/electrical faults
Understand on board line of responsibility and communications
Requirements for reporting accidents and incidents to the master or responsible person on board
Code of Safe Working Practices
Understand the risks of falling into the water
Understand the importance of work place cleanliness
Demonstrate the use and care of personal protective equipment
Understand the principles for protection of the environment from pollution
Understand the methods for the prevention of accumulation of rubbish and debris
Precautions to be taken when using calor gas installations and use of gas alarms and testing
Understand the principles of a confined space and the precautions to be taken prior to entry

<b>SUBJECT</b>
<b>Communications</b>
Knowledge of external means of communication available on board the vessel
Knowledge of internal means of communication available on board the vessel
Passenger care & control
Passenger safety briefing
Passenger counting and number recording procedures
Duties with respect to passenger muster and evacuation at operational level

**STCW certificates are accepted as equivalent training in the corresponding subject if held, and in date.**

## ANNEX 5 - ANCILLARY CERTIFICATES

### Safety Certification

Additional safety training and certification is required depending on the licence type.

The table below details the requirements for each of the safety certificates required.

Course/Training	Applicable Licence
RYA Basic Sea Survival	Boatmaster Boat Engineer Competent Crew ( <i>within 6 months of licence issue</i> )
RYA First Aid	Boatmaster Boat Engineer
RYA Offshore Safety	Boatmaster Boat Engineer
RYA Professional Practices & Responsibilities	Boatmaster Boat Engineer ( <i>within 12 months of licence issue</i> )
Local Knowledge Endorsement	Boatmaster
RYA Marine Radio Short Range Certificate	Boatmaster
RYA Radar Operator Course	Boatmaster
RYA Diesel Engine Maintenance Course	Boat Engineer

Alternative safety training and certification may be considered by the Harbour Master as equivalence.

Regular refresher training is strongly recommended by the Administration.

## **ANNEX 6 - RECOGNISED PROFESSIONAL QUALIFICATIONS FOR BOATMASTERS**

Masters of vessels in commercial use under 24m in loadline length shall hold one of the following qualifications, in addition to a Boatmaster licence issued by the Administration:

- IYT Master of Yachts 200 tons (Coastal) and 3 months relevant experience
- IYT Master of Yachts 200 tons (Limited) and 3 months relevant experience
- IYT Master of Yachts 200 tons (Unlimited) and 3 months relevant experience
- RYA Advanced Powerboat Certificate of Competency with commercial endorsement
- RYA Day Skipper - Theory & Practical Certificate with commercial endorsement and 3 months relevant experience
- RYA Yachtmaster Coastal Certificate of Competency or Service with commercial endorsement and 3 months relevant experience
- RYA Yachtmaster Ocean Certificate of Competency with commercial endorsement and 3 month relevant experience
- RYA Yachtmaster Offshore Certificate of Competency with commercial endorsement and 3 months relevant experience
- UK Certificate of Competency - Master Code Vessel less than 200gt (unlimited or limited to 150 miles from a safe haven)
- UK Certificates of Competency (STCW Class II/1, II/2 or II/3, except Master Code Vessel less than 200gt)
- UK Certificates of Equivalent Competency (STCW Class II/1, II/2 or II/3)
- UK Fishing Deck Certificates of Competency Class 1 or 2 (or pre 1984 equivalent)



## **ANNEX 7 - ALTERNATIVE COMPLIANCE STANDARDS FOR RIGID INFLATABLE BOATS WISHING TO OPERATE OUTSIDE THE HOURS OF DAYLIGHT WITHIN AREA CATEGORY 3**

The following are interpretations of the guidance provided by Figure A7.1:

‘a secondary means of propulsion with totally independent systems’ means a second means of propulsion should be provided that can be used to enable the vessel to return to a safe haven. This could mean a small outboard motor, provided it has adequate power to propel the vessel through the anticipated conditions likely to be encountered and while laden with the maximum certified persons and/or cargo.

‘daylight’ means one hour before sunrise until one hour after sunset.

‘full risk assessment’ means a written risk assessment that fully considers all risks that the vessel and persons on board could reasonably expect to encounter during the operation outside of the hours of daylight. Mitigation to reduce the risks to the vessel, where possible, should be provided.

‘wearing of a lifejacket’ means that all persons on board should wear an approved lifejacket in accordance with the requirements of this Code. Where additional personal exposure protection clothing is worn, the lifejacket should be suitable to be worn with that clothing. The lifejacket should be fitted with a light.

‘carrying of personal exposure protection clothing’ means all persons on board should have available on board a dry suit, a floatation suit meeting EN ISO 15027-1 or other suitable foul weather clothing. The administration strongly recommends that this should not include the use of an immersion suit which is designed only for emergency situations - for example, SOLAS immersion suits are not considered appropriate for this purpose. Warm head wear should be provided and where the protective clothing is not insulated but is waterproof, warm clothing should also be available to wear beneath it.

‘wearing of personal exposure protection clothing’ means all persons on board should wear a dry suit, a floatation suit meeting EN ISO 15027-1 or other suitable foul weather clothing. The administration strongly recommends that this should not include the use of an immersion suit which is designed only for emergency situations - for example SOLAS immersion suits are not considered appropriate for this purpose. Warm head wear should be provided and where the protective clothing is not insulated but is waterproof, warm clothing should also be worn beneath it.

### **1. Certification**

- 1.1 The Certificate that the vessel is issued with should be endorsed with “Restricted Category 3”.

Any additional operational limitations and requirements and any further conditions considered necessary by the Harbour Master should be included within the 'conditions' section of the applicable Code Compliance Certificate.

**Figure A7.1 Acceptance Matrix for Restricted Category 3 RIBs without a Permanent Substantial Enclosure.**

Daylight & Favourable Weather (Lower Service Area)		RESTRICTED CATEGORY 3 24/7 (without a Permanent Substantial Enclosure)					Un-restricted operation (Higher Service Area)
		Distance from a safe haven	Favourable Weather <sup>14</sup> & Seasonal Restrictions <sup>15</sup>	Favourable Weather & NO Seasonal Restrictions	NO Weather Restriction & NO Seasonal Restrictions	Distance from a safe haven	
From a Nominated Departure/arrival Point CATEGORY 5	From a Safe Haven CATEGORY 4	Up to 20nm	NOT PERMITTED	NOT PERMITTED	NOT PERMITTED	Up to 20nm	CATEGORY 3
		Up to 10 nm	1. Carrying of personal exposure protection clothing. To be worn at the discretion of the skipper. 2. Wearing of lifejackets.	1. All vessels to have a secondary means of propulsion with totally independent systems. 2. Full Risk Assessment. 3. Carrying of personal exposure protection clothing. To be worn at the discretion of the skipper. 4. Wearing of lifejackets	NOT PERMITTED	Up to 10nm	
From a Nominated Departure Point CATEGORY 6		Up to 3nm	1. Carrying of waterproof and warm clothing. To be worn at the discretion of the skipper. 2. Wearing of lifejackets.	1. Carrying of waterproof and warm clothing. To be worn at the discretion of the skipper. 2. Wearing of lifejackets.	1. All vessels to have a secondary means of propulsion with totally independent systems. 2. Full Risk Assessment. 3. Carrying of personal exposure protection clothing. To be worn at the discretion of the skipper. 4. Wearing of lifejackets.	Up to 3nm	

<sup>14</sup> “Favourable weather” with respect to a small vessel means conditions existing throughout a voyage or excursion in which the effects either individually or in combination of swell, height of waves, strength of wind and visibility cause no hazard to the safety of the vessel, including handling ability. In making a judgement on favourable weather, the Master should have due regard to official weather forecasts for the service area of the vessel or to weather information for the area which may be available from the Coastguard or similar coastal safety organisation.

<sup>15</sup> Seasonal Restrictions – Restricted to operation between 1 April and 31 October.

## ANNEX 8 - STABILITY INFORMATION BOOKLET CONTENTS

The outlines of the required stability information are set out in MSN 1752, schedule 6.

The Booklet should include the items below where applicable. The format should be as set out.

SCHEDULE OF CONTENTS		
Front Cover		Name of vessel Intact stability information Booklet date of issue Version number Name and address of Naval Architect
Contents		Contents with page numbers
General Particulars		Vessels name Official number Port of registry Certifying Authority Number of persons carried Maximum weight of cargo Area of operation Name and address of owners Class Material of construction Yard number Builder's name and address Fitted out by (if different) Date of build Date of commissioning Dimensions Length overall Length BP Moulded beam Depth Rake of keel Displacements: fully laden, lightship Draughts: fully laden: lightship Minimum freeboard: lightship Freeboard gross and net tonnage
General Arrangement		Profile – including definition of FP, AP Plan – midships, base line
Arrangement of Tanks & Ballast		Plan and profile views showing tank positions and position of any permanent ballast

Arrangement of Sections		<p>Booklet arranged in section so that the most essential matters are brought to the user's attention first</p> <p>Refer to sample book for text</p> <p>Section 1      Operational Information</p> <p>Section 2      Technical Data and Loading Conditions</p> <p>Section 3      Reference Information including Lightship and VCG Derivation Name and version number of stability software used</p>
Section 1		Stability Information
	1.1	<p>Special notes regarding the stability of the vessel</p> <p>Example of static stability curve with details of Area A, Area B, Area C, Point X, Maximum GZ and Initial GM refer to sample book for text</p>
	1.2	<p>General precautions against capsizing and downflooding</p> <p>Area of operation</p> <p>Stability criteria</p> <p>Weather</p> <p>Include paragraphs 1, 2, 3 of sample book</p> <p>Reference to location of downflooding openings</p> <p>Statement ref: maximum crane load (kg) and maximum outreach (m) (if applicable) and any other relevant advice ref: crane operation, such as the provision and use of an inclinometer</p>
	1.3	GZ Curve – condition 1 – Fully Laden Departure including critical downflooding angle
	1.4	<p>GZ data and assessment against criteria – condition 1 – Draft forward Draught aft</p> <p>Table with DISP, Draft FP, Draft AP, WSA, WPA, LCB, VCB, GZ, LCF, TCF against heel angle 0 to 90°</p> <p>Stability summary, detailing required criteria, achieved criteria, margin and pass/fail for following:</p> <p>Area 0° to 30°</p> <p>Area 0° to 40° or downflooding</p> <p>Angle GZ at 30° or greater</p> <p>Angle at GZ max GM downflooding angle</p>
	1.5	GZ Curve – condition 2 – Arrival 10% consumables including critical downflooding angle

	1.6	GZ data and assessment against criteria – Condition 2 – Draft forward Draught aft Table with DISP, Draft FP, Draft AP, WSA,WPA, LCB, VCB, GZ, LCF, TCF against heel angle 0 to 90° Stability summary, detailing required criteria, achieved criteria, margin and pass/fail for following: Area 0° to 30° Area 0° to 40° or downflooding Angle Area 30° to 40° or Downflooding angle GZ at 30° or greater Angle at GZ max GM downflooding angle GZ Curve, GZ data and assessment against criteria for any other relevant load condition, for instance different load/passenger combinations
	1.7	Maximum VCG (KG) Curve with appropriate range of displacement and trim
	1.8	Example showing the use of the maximum KG Curve refer to sample book for text
	1.9	Summary of pass/fail margins and stability category for each load condition refer to sample book for text
	1.10	Freeboard and draught marks Depth from baseline to top of deck at midships (m) Maximum fully laden draught at midships (m) Minimum freeboard at midships (m) Position of midships (metres aft of foreside of stem at deck level) Diagram showing location and dimensions of draught mark Determination of draughts at AP and FP relative to BL from draughts read at marks
Section 2		Technical Data and Loading Conditions
	2.1	Draught marks and hydrostatic datum Drawing identifying draught marks and datum
	2.2	Angles of deck edge immersion and downflooding Drawing identifying downflooding openings Table listing each downflooding point, the area of each opening, the angle of immersion in each loadcase
	2.3	Arrangement of tanks and ballast Drawing showing tanks and ballast fitted Table listing tank capacities, fluid, location, weight, LCG, VCG, TCG and FSM Details of ballast weight and location Reference to baseline, forward perpendicular, transverse origins and +ve –ve trim

	2.4	Loading condition – Departure 100% consumables Weights and centres table, referenced to LCG, VCG, TCG and Free Surface Include draught @ AP, draught @ FP, mean draught, trim, GM solid, free surface correction GM fluid - refer to sample book for table
	2.5	Loading condition – arrival 10% consumables Weights and centres table, referenced to LCG, VCG, TCG and free surface Include draught @ AP, draught @ FP, mean draught, trim, GM solid, free surface correction GM fluid – refer to sample book for table
	2.6	Hydrostatic data – trim 1° forward (or as may be appropriate) For an appropriate range of draughts, displacement, wetted area, LCB, CLF, KB, KMT, KML, TPC, MTC refer to sample book for table
	2.7	Hydrostatic data – level trim For an appropriate range of draughts, displacement, wetted area, LCB, LCF, KB, KMT, KML, TPC, MTC refer to sample book for table
	2.8	Hydrostatic data – trim 1° aft (or as may be appropriate) For an appropriate range of draughts, displacement, wetted area, LCB, LCF, KB, KMT, KML, TPC, MTC refer to sample book for table
	2.9	KN data – trim 1° forward (or as may be appropriate) For an appropriate range displacement vs appropriate range of heel angle – refer to sample book for table
	2.10	KN data – level trim For an appropriate range displacement vs appropriate range of heel angle – refer to sample book for table
	2.11	KN data – trim 1° aft (or as may be appropriate) For an appropriate range displacement vs appropriate range of heel angle – refer to sample book for table
	2.12	Notes on the use of KN data refer to sample book for text Inert hull section drawing illustrating the relative positions of K, M, G, GZ and B
	2.13	Notes on the use of free surface moments Include calculation of maximum free surface moment – refer to sample book for text

Section 3		Reference information including lightship and VCG derivation
	3.1	Inclining experiment report List vessel, type, location, date and time, weather, sea state, SG of water, condition of vessel, tanks, persons present, inclining weights, pendulum, length forward and aft draughts, mean draught, trim, inclined displacement List of pendulum readings GM calculation Displacement, LCG, KMT, GMT, free surface correction, VCG (KG) in inclined condition
	3.2	Lightship derivation Weights and centres table of items to be removed Weights and centres table of items to be added Weights and centres summary
	3.3	Tank capacity data sounding Capacities volume and weight LCG, VCG, TCG, FSM
	3.4	Crane Crane model Crane position Load radius diagram Including freeboard and angle of heel at maximum heeling moment All personnel on deck when lifting All principal openings to remain closed when lifting Restriction of lifting over "crane2 side Vessel to have no residual heel prior to lift Variation from standard load-radius diagram for crane – refer to sample book for text and refer to sample book for table Any additional load and outreach data that may be relevant particularly if crane off centreline
	3.5	Record of minor modifications – refer to sample book for table
	3.6	Beaufort scale of wind speeds and corresponding pressures
	3.7	Metric/imperial conversion



## ANNEX 9 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 vessel or directly from the open air outside the vessel and which vents the products of combustion directly to open air outside the vessel.

### 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, 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 vessel’s interior and fitted with a vent and drain, so that gas which may leak can disperse overboard.

- 3.2 The vent and drain shall not be less than 19mm in diameter, shall run to the outside of the craft and shall terminate 75mm or more above the 'at rest' waterline. The drain and locker ventilation shall be 500mm or more from any opening to the vessel'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 changeover 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 For rigid pipework systems, the pipes shall be 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 (eg 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 (eg 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% (representing approximately 25% 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 vessel in operation.
- 8.4 Gas detection system components (ie gas detector head) likely to be in an explosive air/gas atmosphere shall not be capable of igniting that atmosphere.

- 8.5 In all cases, the arrangements shall be such that the detection system can be tested frequently whilst the vessel 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.
- 8.6 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 vessel. 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 (ie 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 10 - FIRE TEST FOR FRP**

### **1. Heat Source**

- 1.1 The heat source for the fire test should be provided by a Butane or Propane fuelled Bunsen or Tirril burner with a nominal 9.525mm ( $\frac{3}{8}$  inch) inside diameter tube adjusted to give a pre-mixed air/gas flame of 38.1mm (1½ inch) length. The minimum temperature measured in the centre of the flame with a calibrated thermocouple pyrometer must be 843.33°C (1550°F).

### **2. Specimen**

- 2.1 The specimen should be 500mm x 500mm. The edges of the specimen should be housed in a steel frame sufficiently to prevent them igniting during the test. The specimen should be cured for at least 7 days at ambient temperature or 1 day at ambient temperature and 16 hours at 40°C before testing. The lay-up of the panel should be representative of the structure being considered.

### **3. Test Procedure**

- 3.1 The specimen should be oriented vertically in a draft free location. The flame should impinge on the centre of the specimen with the flame normal to its surface. The surface of the specimen affected by the fire risk should be exposed to the flame at a set distance of 19.1mm ( $\frac{3}{4}$  inch) from the end of the burner tube. The flame should not burn through the specimen within 15 minutes.

## ANNEX 11 - IGNITABILITY TEST FOR COMBUSTIBLE MATERIAL

### 1. Test Specimens

- 1.1 One specimen is to be prepared
- 1.2 The specimen is to be a minimum of 150mm x 150mm and of the thickness which is used on the vessels, together with any facing with which it is normally covered.

### 2. Conditioning of Test Specimens

- 2.1 The conditioning atmosphere should have a temperature of  $20 \pm 20^{\circ}\text{C}$  and relative humidity of  $65 \pm 2\%$ .
- 2.2 The specimen should be laid flat, in the conditioning atmosphere for a period of 24 hours, or for a sufficiently longer period in order to ensure that the mass of the specimen shows no progressive change greater than 0.25% when it is determined at intervals of 2 hours.

### 3. Atmosphere for Testing

- 3.1 The test is to be conducted in an atmosphere the same as for conditioning the specimen, or within 2 minutes of removal from the conditioning atmosphere.
- 3.2 Appropriate measures should be taken to prevent draughts in the vicinity of the testing equipment when testing is in progress.

### 4. Testing Procedure

- 4.1 Source of Ignition  
The source should be obtained by using a burner consisting of a copper tube having a length of 150mm and inside and outside diameters of 5mm and 6mm respectively connected by a plastic or rubber tubing to a gas tap supplying natural gas. The copper tube is to have no opening for the supply of air.
- 4.2 Height of Flame  
Before the test takes place the burner flame is to be adjusted to a height of 32mm.

## 4.3 Test Procedure

- 4.3.1 Place the specimen horizontally on a metal tripod stand with the upper surface of the specimen facing downwards (ie with normally exposed face on underside) such that the height of this surface of the specimen is approximately 8mm below the top of the burner flame. Apply the burner flame at right angles to the plane of the specimen in the centre of specimen. After one minute the burner flame is to be removed clear of the specimen and the time in seconds to extinction of any flaming is to be recorded.
- 4.3.2 The test in paragraph 4.3.1 is to be repeated after any flaming or smouldering has ceased and the temperature of the specimen has returned to normal except that the centre of the burner flame is to be positioned at the midpoint of any edge of the specimen. Again the time in seconds to extinction of any flaming after the removal of the burner is to be recorded.

## 5 Pass Criteria

An insulation is deemed to be "not readily ignitable" when any flaming of the test specimen ceases within 20 seconds of the removal of the burner.