The Bahamas Maritime Authority

The Bahamas Small Charter Yacht Code

Version 1.0

bahamasmaritime.com

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FOREWORD

This Foreword is provided for explanatory purposes and is not part of the Code provisions.

The Bahamas Small Charter Yacht Code ("the Code" or "BSYC") provides construction and safety equipment standards for Small Charter Yachts (SCY) between 12 metres and less than 24 metres length (L)[1]. The Code is also recommended for Small Private Yachts.

The Code is based on the United Kingdom Small Commercial Vessel and Pilot Boat Code of Practice (MGN280) modified to suit the particular requirements of The Bahamas. The Bahamas Maritime Authority wishes to acknowledge and thank the UK Maritime and Coastguard Agency (MCA) for their permission to base this Code upon MGN280.

The Bahamas Maritime Authority ("BMA") is the administration that manages The Bahamas Ship Register on behalf of the Government of the Commonwealth of The Bahamas, whose flag the vessel is entitled to fly.

Vessels are required to comply with the various Merchant Shipping Regulations of The Bahamas which are relevant to the class of vessel to which they belong. Yachts in charter (commercial) or private (non-commercial) use for sport or pleasure do not fall naturally into a single class and, in any case, prescribed merchant ship safety standards may be incompatible with the safety needs particular to yachts.

The Code specifically applies to Charter Yachts which are less than 24 metres in length (L), in commercial use for sport or pleasure, do not carry cargo and do not carry more than 12 passengers.

It is recommended that Private Yachts comply with the standards of the Code, at the least in respect of lifesaving and firefighting standards, as if they were Charter Yachts.

Charter Yachts of 24 metres in length (L) and above shall comply with the Bahamas Large Charter Yacht Code (BLYC).

Yachts, private or charter, of 12 meters of length (L) and above, carrying more than 12 but not more than 36 passengers shall comply with the Bahamas Passenger Yacht Code (BPYC).

The Code sets required standards of safety, security and pollution prevention which are appropriate to the size of the yacht. The standards applied are either set by the relevant international conventions or equivalent standards where it is not reasonable or practicable to comply. The standards adopted are judged to be at least equivalent in their effect to those required by the international conventions which apply to a particular vessel.

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[1] Length (L) or "Load Line length" means 96% of the total length on a waterline of a ship at 85% of the least moulded depth measured from the top of the keel, or the length from the fore-side of the stem to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel the waterline on which this is measured shall be parallel to the designed waterline.

The BMA may consider a specific alternative equivalent standard to any standard required by the Code. Applications which justify either an alternative or exemption from a specific requirement of the Code can be made to the BMA.

Compliance with the standards required by the Code will entitle a vessel to be issued with the certification required by the international conventions and Bahamas legislation applicable to the vessel, upon satisfactory completion of the corresponding surveys and inspections.

The certificates demanded by the international conventions which apply to the vessels covered by the Code are summarised in Section 31.

When equipment manufactured in accordance with a recognised International standard is required by the Code, the BMA may accept existing equipment that can be shown to be of an equivalent standard and which does not increase the risk to the ship or its crew and passengers. When such equipment is replaced, the replacement shall conform to the standard required by the Code.

It is recognised that the Code may be required to be revised in the light of experience gained in its application. Section 1.3 makes provision for this.

Any suggestions for amendments, clarifications or additions may be sent to yachts@bahamasmaritime.com with the subject “BSYC Change Request”.

1 APPLICATION AND INTERPRETATION

1.1 Purpose

1.1.1 The purpose of The Bahamas Small Charter Yacht Code ("the Code", or "BSYC"), is to provide design criteria, construction standards and other safety measures for Bahamian charter yachts of less than 24 metres length (L) (Load Line length) which are engaged at sea in activities on a commercial basis, and which do not carry cargo and do not carry more than 12 passengers.

1.1.2 It is the responsibility of the owner/managing agent to ensure that a vessel is properly maintained, examined and manned in accordance with the Code. The Code applies whether the owner/managing agent is corporate, private or of a charitable nature.

1.1.3 The Code applies to all new yachts specified in paragraph 1.1.1 constructed or at a similar stage of construction on or after the date of this Code coming into force.

1.1.4 At the date of application of the Code, any yacht which is in possession of a valid Certificate or similar document, issued under equivalent standards accepted by the BMA, may continue to be so certificated provided they comply with the standards under which they were examined, unless specifically stated within this Code. Where new equipment is installed, or the vessel undergoes modification, the standards of this Code relevant to the change are to be applied as far as is practicable.

1.1.5 A yacht certificated under Section 1.1.4 that changes to a more onerous mode or category of operation, shall comply with the section(s) of this Code applicable to that change of mode or category of operation.

1.1.6 A sailing vessel certified under Section 1.1.4 , having a STOPS numeral previously allowing operation in Area Categories 0 or 1, but opting to operate in a less onerous category for equipment or other reasons, shall be allowed to operate in Area Categories 0 or 1, subject to compliance with the manning and equipment standards of this Code.

1.1.7 A yacht to which the Code applies, but which exceeds the speed/displacement ratio as defined within the IMO High Speed Craft Code need not be certified under the High Speed Craft Code, if certificated to the requirements of this Code.

1.1.8 All yachts registered under the Merchant Shipping Act shall comply with applicable Bahamas legislation.

1.1.9 Yachts engaged on international voyages shall comply with the relevant international conventions and applicable Bahamas legislation.

1.2 Application

1.2.1 The Code specifically applies to a motor or sailing vessel of less than 24 metres in length (L) and which, at the time, is in commercial use for sport or pleasure and carries no cargo and no more than 12 passengers including social guests. Sail training vessels are included in this application.

1.2.2 Subject to Section 1.6, existing vessels may alternately elect to apply for certification in accordance with the Code, and the Code shall apply to such vessels in the same way as it applies to new vessels.

1.2.3 Subject to Section 1.2.4, all ships which undergo repairs, alterations, modifications and outfitting related thereto shall continue to comply with, as a minimum, the requirements previously applicable to these ships.

1.2.4 Any ship, whenever built, which is converted to a yacht, or undergoes repairs, alterations and modifications which substantially alter the dimensions of the ship, or substantially increase the ship's service life, shall be treated as a new vessel constructed on the date on which such conversion, repairs, alterations or modifications commenced.

1.3 Review of the Code

1.3.1 The content of the Code will be reviewed periodically and, if necessary revised, by the BMA in consultation with relevant stakeholders.

1.3.2 When new standards are developed and finalised by the International Maritime Organization (IMO), International Organization for Standardization (ISO) or any other international body, which impact upon the requirements of the Code, amendment of the Code may be considered immediately.

1.3.3 The Merchant Shipping (Yachts) Regulations 2020 provide for, from time to time, any document amending the Code which is considered relevant to be specified by the BMA in a Marine Notice or Yacht Notice, pending revision of the Code.

1.4 International Conventions and Related Instruments

1.4.1 Where the Code requires a yacht to comply with any of the provisions of an International Convention (or other related instrument), and the applied requirements are separated into different vessel types, a yacht shall comply with the applied requirements of the Convention that apply to a cargo ship. This is subject to any express provision to the contrary in the Code.

1.5 Area of Operation

1.5.1 In general, requirements given within the Code are based on geographical operation outside Polar Regions.

1.5.2 Vessels which are intended to operate in Polar Regions shall meet the requirements of this Code and the IMO Polar Code[2] to the extent practicable (see paragraph 3.8).

1.5.3 A yacht may be considered for the issue of a Bahamas Small Charter Yacht Code Certificate of Compliance allowing it to operate in one of the following areas:

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

1.5.4 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 shall be recorded on the Certificate of Compliance.

1.6 Existing vessels/vessels under construction

1.6.1 In the case of an existing Bahamian registered vessel which does not comply fully with the Code safety standards but for which the Code standards are reasonable and practicable, the BMA may give due consideration to a proposal from the Company to phase in requirements.

1.6.2 When an existing Bahamian registered vessel does not meet the Code safety standard for a particular feature and it can be demonstrated that compliance is neither reasonable nor practicable, proposals for alternative arrangements may be submitted to the BMA for approval. In considering individual cases, the BMA shall take into account the vessel's service history and any other factors which are judged to be relevant to the safety standard which can be achieved.

1.6.5. Vessels the keels of which were laid or were at a similar stage of construction on or after the date of this Code coming into force, shall comply with this edition of the Code in its entirety.

1.7 Interpretation

1.7.1 Where a question of application of the Code, or an interpretation of a part of the Code arises, the owner/managing agent of the vessel concerned shall in the first instance seek

[2] BMA voluntarily applies the Polar Code to non-SOLAS vessels, as per IMO Resolution A.1137(31)

clarification from the Survey Organisation. Where it is not possible to resolve an issue of interpretation a decision may be obtained on written application to the Deputy Director, Inspections & Surveys of the BMA, who may consult with others as deemed appropriate.

1.8 Equivalent Arrangements

1.8.1 When the Code requires that a particular piece of equipment or machinery shall be provided or carried in a vessel or that any particular provision shall be made, to a specified standard, the BMA may permit any other piece of equipment or machinery to be provided or carried, or any other provision to be made, provided that the BMA is satisfied by trials or otherwise that the alternative is at least as effective as that required by the Code.

1.8.2 Proposals for the application of alternative standards considered to be at least equivalent to the requirements of the Code shall be submitted to the BMA for approval.

1.8.3 Deviations from the requirements of the Code may be considered by the BMA, provided that the equivalence:

.1 is based on equivalent standards;

.2 incorporates increased requirements to balance deficiencies and thereby provide an equivalent level of safety to the Section concerned;

.3 meets the intent of the requirements concerned;

.4 incorporates any specific requirements in the chapter's 'Additional Equivalence Considerations' section; and where necessary;

i. has successfully undergone testing to the satisfaction of the BMA; or

ii. has successfully undergone, an engineering analysis, evaluation and approval by the BMA.

1.9. Exemptions

1.9.1. Exemptions shall be granted only by the BMA.

1.9.2. Applications for exemption shall be made to the BMA and be supported by justification for the exemption.

1.9.3. The granting of exemptions shall be limited by the extent to which the International Conventions allow and shall in all instances be regarded as exceptional.

1.10 Vessel Coded under similar Codes

1.10.1 Vessels coded under similar Codes that are considered equivalent by the BMA may be considered under the standards in force at the time of initial certification.

1.10.2 A non-exhaustive list of equivalent Codes is provided in Annex 1 of Yacht Notice 05.

1.11 Recognised Organisations and Yacht Survey Organisations

1.11.1 The BMA may conduct yacht surveys and is responsible for the issue of full term Bahamas Small Charter Yacht Certificate of Compliance for small charter yachts and Bahamas Small Charter Yacht Statements of Compliance for small private yachts in voluntary compliance.

1.11.2 The BMA may appoint suitably qualified organisations as Recognised Organisations or Yacht Survey Organisations ("Survey Organisations") under a written Agreement and has the right to audit those organisations for compliance with the terms of the Agreement.

1.12 Certification

1.12.1 To be issued with a certificate for a particular area of operation, a yacht must comply with all of the requirements of the Code for that operating area to the satisfaction of the Survey Organisation.

1.13 Sports Diving, Sea Angling and Other Water Based Recreational Activities

1.13.1 The Code deals with the safety of the vessel and its occupants but not sport or pleasure activities involving special safety requirements.

1.13.2 Yacht owners/managing agents and charterers are recommended to discuss and agree their respective responsibilities for safety before the yacht goes to sea.

1.14 Water Based Commercial Activities

1.14.1 The Code deals with safety of the vessel and its occupants but the commercial activities other than normal seamanship duties are not considered under the Code e.g. commercial diving.

1.15 Vessels Operating on-non-international and/or restricted service

1.15.1 When the owner/managing agent of a vessel which operates in non-international voyages in protected waters and/or a restricted service considers that full application of the Code would be inappropriate because other safety provisions have been made, the owner/managing agent may request the Deputy Director, Inspections & Surveys of the BMA, via the Survey Organisation, to consider certification of the vessel in compliance with alternative safety standards recognised by the local authority.

2 DEFINITIONS

2.1 For the purpose of this Code, unless expressly provided otherwise the terms used therein have the meanings defined in this section (Note – where a definition is not contained within this Code, guidance shall be taken from meanings given within the International Conventions).

2.2 Except where the context otherwise requires, throughout the Code the terms “yacht”, “ship” and “vessel” are synonymous.

2.3 The following definitions apply to this Code:

““A” Class divisions”	means those divisions formed by bulkheads and decks which comply with the following criteria: 1. they are constructed of steel or other equivalent material; 2. they are suitably stiffened; 3. they are insulated with approved non-combustible materials such that the average temperature of the unexposed side 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, within the time listed below: class "A-60" 60 min class "A-30" 30 min class "A-15" 15 min class "A-0" 0 min 4. they are constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test; and 5. the Administration required a test of a prototype bulkhead or deck in accordance with the Fire Test Procedures Code to ensure that it meets the above requirements for integrity and temperature rise
“Accommodation spaces”	means those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, game and hobby rooms, barber shops, pantries containing no cooking appliances and similar spaces

"Administration"	with regards to this Code means: 1. the BMA; 2. the Government of the State whose flag the ship is entitled to fly; or 3. a Recognised Organisation; or 4. Yacht Survey Organisation
"Aft terminal"	means the aft limit of the subdivision length
"Aft perpendicular"	means the perpendicular taken at the after end of length (L)
"Amidship"	means at the middle of the length (L)
"Annual Inspection"	means an inspection conducted on behalf of the BMA by an Authorised Yacht Surveyor to verify compliance with this Code. On completion of the inspection a Bahamas Small Yacht Certificate of Compliance will be issued valid for 5 years, subject to annual endorsement
"Approved"	in respect of materials or equipment means approved by the BMA or approved by an Administration or organisation that is formally recognised by the BMA under the guidance within BMA Information Bulletin No 71
"Authorised yacht surveyor"	means a yacht surveyor, as defined in Yacht Notice 09, who by reason of professional qualifications, practical experience and expertise is authorised by the BMA to carry out the survey required for the vessel. This includes surveyors of Recognised Organisations and Yacht Survey Organisations
""B" class divisions	means those divisions, referred to as "B-15" or "B-0", formed by bulkheads, decks, ceilings or linings which comply with the following criteria: 1. they are constructed of approved non-combustible materials and all materials used in the construction and erection of "B" class divisions are non-combustible; 2. they have an insulation value such that the average temperature of the unexposed side shall not rise more than 140°C above the original temperature, nor shall the temperature at any one point, including any joint, rise more than 225oC above the original temperature, within the time listed below:

class "B-15" 15 min
class "B-0" 0 min

3. they are constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test; and
4. the Administration required a test of a prototype division in accordance with the Fire Test Procedures Code to ensure that it meets the above requirements for integrity and temperature rise.

"BMA"	means the Bahamas Maritime Authority
"Bulletin"	means a Bulletin published by the BMA that advises owners, masters, other seafarers and other interested parties of advice that may assist in the interpretation or implementation of legislation applicable to Bahamian registered vessels. It includes reference to any subsequent Bulletin amending or replacing the original that is considered by the BMA to be relevant
"Cargo"	means an item(s) of value that is carried from one place and discharged at another place and for which either a charge or no charge is made and is not for use exclusively on board the vessel
"Charter Yacht"	means a yacht that is not a Private Yacht or a passenger ship
"Classification Society"	means a "Recognised Organisation"
"Code"	means The Bahamas Small Charter Yacht Code
"Combustible material"	means any material other than a non-combustible material
"Continuous "B" class ceilings or linings	means those "B" class ceilings or linings which terminate at an "A" or "B" class division
"COLREGs"	means the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREG 72), as applicable
"Compartment"	means all living and working spaces within the watertight or fire-resisting boundaries on any one level which have inter-communicating access

"Company" means the Owner of the ship or any other Organisation or person such as the Manager, or the Bareboat Charterer, who has assumed the responsibility for operation of the ship from the Shipowner and who on assuming such responsibility has agreed to take over all the duties and responsibilities imposed by the Code

Daylight means one hour before sunrise until 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

Design Category means a description of the wind and sea conditions and used for the application of relevant ISO standards. See table below:

Design category	Wind force (Beaufort scale)	Significant wave height (H 1/3, metres)
A- 'Ocean'	Exceeding 8	Exceeding 4
B- 'Offshore'	Up to, and including, 8	Up to, and including 4
C - 'Inshore'	Up to, and including, 6	Up to, and including, 2
D - 'Sheltered waters'	Up to, and including, 4	Up to, and including 0,3, with occasional 0,5

"Deadlight" means a secondary watertight closure fitted to a glazed opening and which is fitted to the inside of the vessel

"Design waterline" means the deepest loaded draught as per the all seasons Load Line assigned to the vessel

"Draught" or (d) means the vertical distance from the keel line at mind-length to the waterline in question

"Efficient" in relation to a fitting, piece of equipment or material means that all reasonable and practicable measures have been taken to ensure that it is suitable for the purpose for which it is intended to be used

"EPIRB" means a satellite emergency position-indicating radio beacon, being an earth station in the mobile-satellite service, the emissions of which are intended to facilitate search and rescue operations, complying with performance standards adopted by the IMO contained in Resolutions A.810(19) and A.662(16), or any Resolution amending or replacing these from time to time and which is considered by the BMA to be relevant, and is capable of:

1. floating free and automatically activating if the ship sinks;
2. being manually activated; and
3. being carried by one person.

"Existing vessel"	means any vessel; the keel of which was laid or the construction or lay-up was started prior to the date of this Code coming into force
"Favourable weather"	means wind, sea and visibility conditions which are deemed by the skipper to be safe for a yacht to operate within the limits applied to it; or, in any other case 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 skipper 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 coastal safety organisation
"FTP Code"	means the International Code for Application of Fire Test Procedures
"flashpoint"	means the temperature in degrees Celsius (closed cup test) at which a product shall give off enough flammable vapour to be ignited, as determined by an approved flashpoint apparatus
"Forward perpendicular"	means the perpendicular taken at the forward end of the length (L) such that the perpendicular coincides with the fore side of the stem on the waterline on which the length is measured
"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 vessel, the distance measured vertically downwards from the lowest point of the gunwale to the waterline
"Freeboard deck"	means, subject to paragraphs 1 to 4 below, the deck from which the freeboards is assigned, being and the uppermost complete deck exposed to weather and sea, which has permanent means of closing all openings in the weather part

thereof, and below which all openings in the sides of the ship are fitted with permanent means of watertight closing –

1. In a ship having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck;
2. At the option of the Company and subject to the approval of the BMA, a lower deck may be designated as the freeboard deck provided it is a complete and permanent deck continuous in a fore and aft direction at least between the machinery space and peak bulkheads and continuous athwartships, provided that when this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck;
3. When a lower deck is designated as the freeboard deck, that part of the hull which extends above the freeboard deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard. It is from this deck that the freeboard is calculated

"Garbage"	means all kinds of victual, domestic and operational waste, excluding fresh fish and parts thereof, generated during the normal operation of the vessel and liable to be disposed of continuously or periodically, except sewage originating from vessels
"Glazed opening"	means an opening in the hull, superstructure or deckhouse of a ship structure fitted with a transparent or translucent material
"High Speed Craft Code"	means the International Code of Safety for High Speed Craft, 2000, adopted by the Maritime Safety Committee of the IMO by resolution MSC.97(73), as amended
"High Holding Power (HHP) Anchor"	means an anchor that can be shown to have holding powers of at least twice those of a standard stockless anchor of the same mass
"ILO"	means the International Labour Organization

"Immersion suit"	means a protective suit which reduces the body heat loss of a person wearing it in cold water complying with the requirements of the LSA Code
"IMO"	means the International Maritime Organization, a specialised agency of the United Nations devoted to maritime affairs
"Inflatable lifejacket"	means a lifejacket complying with the requirements of the LSA Code
"Information Notice"	means a Notice published by the BMA that provides information and/or guidance on Bahamas legislation and BMA requirements. It includes reference to any subsequent Notice amending or replacing the original that is considered by the BMA to be relevant
"Keel line"	means a line parallel to the slope of the keel passing amidships through- .1 the top of the keel at centreline or line of intersection of the inside of shell plating with the keel if a bar keel extends below that line, on a ship with a metal shell; or .2 in wood and composite ships, the distance is measured from the lower edge of the keel rabbet and when the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inward intersects the centreline amidships
"Launching appliance (or arrangement)"	means a provision complying with the requirements of the LSA Code for safely transferring a lifeboat, rescue boat, or liferaft respectively, from its stowed position to the water and recovery where applicable
"Length (L)"	means 96% of the total length on a waterline of a ship at 85% of the least moulded depth measured from the top of the keel, or the length from the fore-side of the stem to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel the waterline on which this is measured shall be parallel to the designed waterline
"Lifeboat"	means a lifeboat complying with the requirements of the LSA Code

"Lifebuoy"	means a lifebuoy complying with the requirements of the LSA Code
"Lifejacket"	means a lifejacket complying with the requirements of the LSA Code
"Liferaft"	means a liferaft complying with the requirements of the LSA Code
"Lightweight"	means the displacement of a ship in tonnes without, fuel, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, and passengers and crew and their effects
"Low flashpoint fuel"	means gaseous or liquid fuel having a flashpoint lower than otherwise permitted under SOLAS II-2/4.2.1.1
"LSA Code"	means the International Life-Saving Appliance Code adopted by the Maritime Safety Committee of the IMO by resolution MSC.48(66), as it may be amended by the IMO
"Machinery spaces"	means all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces
"Machinery spaces of Category A"	means those spaces and trunks to such spaces which contain: 1. internal combustion machinery used for main propulsion; or 2. internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or 3. any oil-fired boiler or oil fuel unit, or any oil-fired equipment other than boilers, such as inert gas generators, incinerators, etc
"Margin line"	is a line drawn at least 76 millimetres below the upper surface of the freeboard deck at side

"Marine Notice"	means a Notice published by the BMA that provides instructions related to Bahamas legislation and BMA requirements. It includes reference to any subsequent Notice amending or replacing the original that is considered by the BMA to be relevant
"MARPOL"	means the International Convention for the Prevention of Pollution from Ships, 1973, as amended
"Master"	includes every person (except a pilot) having command or charge of a ship and, in relation to a yacht, include the captain or skipper
"Mile"	means a nautical mile of 1852 metres
"MLC"	means the ILO Maritime Labour Convention 2006, as amended, as applicable for vessels the keels of which are laid on or after 20 August 2013
"Motor vessel"	means a vessel which is described in the register and on the certificate of registry as such, and which has a sole means of propulsion of either one or more power units
"Moulded depth"	means, subject to paragraphs .1 to .3 below, the vertical distance measured from the top of the keel to the top of the freeboard deck beam at side, provided that- .1 in wood and composite ships, the distance is measured from the lower edge of the keel rabbet and where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel; .2 in ships having rounded gunwales, the moulded depth shall be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design; and .3 where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth shall be determined, the moulded depth shall be measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part

"Multihull vessel"	means a vessel which in any normally achievable operating trim or heel angle, has a rigid hull structure which penetrates the surface of the sea over more than one separate or discrete areas
"New vessel"	means a vessel to which this Code applies, the keel of which was laid or the construction or lay up was started on or after the date of this Code coming into force
"Nominated departure point"	means the designated point of departure of the vessel, as specified on the vessels certificate
"Non-combustible material"	means a material which neither burns nor gives off flammable vapours in sufficient quantity for self-ignition when heated to approximately 750°C, this being determined in accordance with the Fire Test Procedures Code
"Not readily ignitable"	means that the surface thus described will not continue to burn for more than 20 seconds after removal of a suitable impinging test flame
"Occasional worker"	As defined in Section 26
"Officer"	means .1 any seafarer who is required to be qualified under the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW); or .2 any other seafarer considered by the Company to be an officer
"Oil fuel unit"	means the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a pressure of more than 0.18 N/mm^2
"Passenger"	As defined in Section 26
"Passenger ship"	means a ship carrying more than 12 passengers

"Permeability" or "(μ)"	of a space means the proportion of the immersed volume of that space which can be occupied by water
"Person"	means a person over the age of one year
"Positive stability"	means the ability of a ship to return to its original position after the removal of a heeling moment, which is obtained with a positive metacentric height (GM)
"Prescriptive requirements"	means the requirements the vessel is bound to comply regarding construction characteristics, limiting dimensions or fire safety systems specified in this Code or in applicable International Conventions or national laws and regulations
"Private yacht"	means any yacht not carrying passengers for reward or remuneration under a charter or hire agreement, for hire, not engaged in trade or commerce or chartered, and being used solely for pleasure or recreational purposes of its owner. More specifically, to be considered a private yacht, the yacht must be: 1. in the case of a yacht owned by a corporate entity, one on which the persons on the yacht are employees, officers, directors, or beneficial owners of the corporate entity, or their immediate family or friends or social guests; or 2. in the case of other ownership arrangements, one on which the persons on board the yacht are beneficiaries under the trust or the employees, officers, beneficial owners, or persons with similar designations of the ownership arrangement, or their immediate family or friends or social guests; and 3. in private use
"Public spaces"	means those portions of the accommodation which are used for halls, dining rooms, lounges and includes similar permanently enclosed spaces
"Recess"	means an indentation or depression in a deck and which is surrounded by the deck and has no boundary common with the shell of the vessel
"Recognised mobile satellite service"	means any service which operates through a satellite system and is recognized by the IMO, for use in the global maritime distress and safety system (GMDSS)

"Recognised Organisation" or "RO"	means a body which has been authorised by the BMA under a written agreement to undertake statutory surveys and issue statutory Certificates on the BMA's behalf and is listed in Marine Notice 02
"Rescue boat"	means a boat complying with the requirements of the LSA Code and designed to rescue persons in distress and for marshalling liferafts
"Retro-reflective material"	means a material which reflects in the opposite direction a beam of light directed on it
"Rigid inflatable boat"	means a vessel with inflatable tubes, attached to a solid hull. The tubes are inflated during normal craft operation
"Safe haven"	means a harbour or shelter of any kind which affords entry, subject to prudence in the weather conditions prevailing, and protection from the force of the weather
"Sailing vessel"	means a vessel which is designed to be navigated under wind power alone and for which any motor provided is an auxiliary means of propulsion and/or which possesses a non-dimensional ratio of (sail area) divided by (volume of displacement)$^{2/3}$ of more than 7;
"Sail training vessel"	means a sailing vessel which, at the time, is being used either: 1. to provide instruction in the principles of responsibility, resourcefulness, loyalty and team endeavour and to advance education in the art of seamanship; or 2. to provide instruction in navigation and seamanship for yachtsmen
"Seafarer"	includes every person (except Occasional Workers and pilots) employed or engaged in any capacity onboard a ship
"Sea Area A1"	means an area within the radiotelephone coverage of at least one VHF coast station in which continuous DSC alerting is available
"Ships constructed"	means ships the keels of which are laid or which are at a similar stage of construction
"Similar stage of construction"	means at a stage which:

.1 construction identifiable with a specific vessel begins; and

.2 assembly of that vessel, comprising at least 50 tonnes or 1% of the estimated mass of all structural material has commenced; or

.3 In the case of vessels constructed of FRP or GRP this shall be considered as the date when more than 5% of the hull resin and reinforcement has been laid

"Social guest"	means a person who has been invited on board the yacht by the owner for which no consideration is given
"SOLAS"	means the International Convention for the Safety of Life at Sea, 1974, as amended, as applicable for vessels the keels of which are laid on or after 01 July 2019
"SOLAS 90"	means the International Convention for the Safety of Life at Sea, 1974 as amended by the IMO October 1988 amendments, which were adopted by resolution MSC.12(56) and entered into force on 29 April 1990
"SOLAS A Pack"	means a liferaft emergency pack complying with the requirements of the LSA Code
"SOLAS B Pack"	means a liferaft emergency pack complying with the requirements of the LSA Code
"Standard fire test"	means a test in which specimens of the relevant bulkheads, decks or other constructions are exposed in a test furnace by a specified test method in accordance with the Fire Test Procedures Code
"STCW"	means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended, as applicable for vessels the keels of which are laid on or after 01 July 2019
"Steel or other equivalent material"	means any non-combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation)

"Submersible craft"	means any description of manned mobile submersible apparatus which is designed to maintain some or all of its occupants at or near atmospheric pressure including free, self-propelled, tethered, towed or bottom contact propelled apparatus and atmospheric diving suits
"Superstructure"	means a decked structure on the freeboard deck, extending from side to side of the ship or with the side plating not being inboard of the shell plating more than 4% of the breadth (B)
"Survey Organisation"	Means the BMA, Recognised Organisation or Yacht Survey Organisation, as applicable
"Survival craft"	means a craft capable of sustaining the lives of persons in distress from the time of abandoning the ship, including liferafts, MES & lifeboats
"To sea"	means beyond any smooth water or partially smooth water limits which may have been designated by The BMA. In the event that no such areas have been designated, then it means that the vessel is considered to have proceeded to sea upon leaving the immediate confines of a designated harbour
"Training manual"	with regard to life-saving appliances means a manual complying with the requirements of SOLAS III/Part B – Life Saving Appliances and Arrangements, Regulation 35
"Training vessel"	means a vessel which may be either a sailing or motor vessel, which is operated to provide: 1. Instruction in the principles of responsibility, resourcefulness, loyalty and team endeavour; and/or 2. Instruction in navigation and seamanship, marine engineering or other shipboard related skills. The vessel must be properly and safely manned at all times, both at sea and, if necessary, in port, by a sufficient number of experienced and competent personnel to ensure that trainees, as defined in Section 26, are adequately supervised giving particular consideration to the number, age and sex of the trainees. All training shall be properly organised with clearly detailed objectives and outcomes.

	Training organisations wishing to operate training vessels carrying more than 12 trainees shall apply to the BMA
"Trim"	means the difference between the draft forward and the draft aft, where the drafts are measured at the forward and aft terminals respectively, disregarding any rake of keel
"Voyage"	includes an excursion
"Watertight"	means capable of preventing the passage of water in any direction under the head of water likely to occur in intact and damaged conditions and in the damaged condition the head of water shall be considered in the worst situation at equilibrium, including intermediate stages of flooding
"Weather deck"	means a deck which is completely exposed to the weather from above and from at least two sides
"Weathertight"	means that in any sea conditions water will not penetrate into the ship and capable of preventing the admission of a significant quantity of water into the ship when subjected to a hose test
"Well"	means any area on the deck exposed to the weather, where water may be entrapped and includes deck areas bounded on two or more sides by deck structures
"Wheelhouse"	means the control position occupied by the officer of the watch who is responsible for the safe navigation of the vessel
"Window"	means a ship's window, being any window, regardless of shape, suitable for installation aboard ships
"Yacht"	For the purposes of this Code, a yacht means a motor or sailing vessel that does not carry cargo, does not carry more than 12 fare-paying passengers on pre-defined routes or itineraries and is intended for sport or pleasure. A yacht is to be defined as being operated: 1. as a Charter Yacht; or 2. a Private Yacht as defined above
"Yacht Notice"	means a Notice published by the BMA that provides instructions related to Bahamas legislation and BMA

	requirements for Yachts. It includes reference to any subsequent Notice amending or replacing the original that is considered by the BMA to be relevant
"Yacht Survey Organisation"	means a body which has been authorised by the BMA under a written agreement to undertake statutory surveys and issue statutory Certificates on the BMA's behalf for unclassed yachts of less than 500 gross tonnage and is listed in Yacht Notice 09

3 INTERNATIONAL & BAHAMAS LEGISLATION

3.1 Conventions - General

3.1.1 Every vessel to which this Code applies shall comply with the relevant provisions of applicable Conventions (as amended), including but not necessarily limited to this Section, to the extent to which it is applied by the BMA.

3.2 Convention on the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREG)

3.2.1 Navigation lights and shapes shall comply with the applicable provisions of COLREG, including the following provisions-

.1 all navigation lights shall be provided with main and emergency power supply;

.2 all navigation lights required to be shown whilst underway are required to be duplicated in accordance with IMO Resolution MSC.253(83)[3] as may be amended from time to time; and

.3 approved LED Lights may be used providing the lights meet the technical specifications of COLREG.

3.3 International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended (MARPOL);

3.3.1 See Section 21.2.

3.4 Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001, as amended (AFS 2001);

3.4.1 See Section 21.3.

3.5 Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004, as amended (BWM 2004);

3.5.1 See Section 21.4.

3.7 The Maritime Labour Convention, 2006 (MLC)

3.7.1 Relevant Conventions of the International Labour Organisation (ILO), including but not necessarily limited to The Maritime Labour Convention, 2006 (ILO).

3.8 The Polar Code

3.8.1 The Polar Code shall apply to all yachts operating in polar waters.

[3] See MSC.253(83) - Adoption of the Performance Standards for Navigation Lights, Navigation Light Controllers and Associated Equipment - (Adopted on 8 October 2007).

3.8.2 Ships constructed before 01 January 2017 shall meet the relevant requirements of the Polar Code by the first intermediate or renewal survey, whichever occurs first, after 01 January 2018.

3.8.3 Every ship to which this sub-section applies shall have onboard a valid Polar Ship Certificate.

3.9 Ships using low-flashpoint fuels:

3.9.1 The International Code of Safety for Ships using Gases or other Low Flashpoint Fuels (IGF) Code shall apply to ships using low-flashpoint fuels:

.1 for which the building contract is placed on or after 01 January 2017;

.2 in the absence of a building contract, the keels of which are laid or which are at a similar stage of construction on or after 01 July 2017; or

.3 the delivery of which is on or after 01 January 2021.

3.9.2 Seafarers working in ships subject to the IGF Code shall receive appropriate training and certification[4].

3.10 Health and Safety

3.10.1 Working practices shall take account of the ILO publication "Accident Prevention on Board Ship", as may be amended from time to time.

3.11 Bahamas Legislation

3.11.1 In applying the provisions of the Code due regard shall be taken of any applicable Bahamas legislation and BMA requirements.

[4] See BMA Information Bulletin No.162

4 CONSTRUCTION AND STRENGTH

4.1 General Requirements

4.1.1 A vessel which operates in Area Category 0, 1, or 2 shall be fitted with a watertight weather deck over the length of the vessel, satisfying the requirements of Section 4.3.1, and be of adequate structural strength to withstand the sea and weather conditions likely to be encountered in the intended area of operation.

4.1.2 A vessel which is not fitted with a watertight weather deck, open boat, in accordance with Section 4.1.1 shall normally be restricted to Area Category 3, 4, 5 or 6 and be provided with adequate reserves of buoyancy and stability for the vessel with its full complement of persons to survive the consequences of swamping.

4.13 A sailing vessel which is not fitted with a watertight weather deck shall be limited to Area Category 6.

4.1.4 An open boat should not carry a combination of passengers and their personal items in excess of 1,000kg (refer to Sections 11 and 12). Such a vessel shall not be fitted with a lifting device.

4.2 Structural Strength

4.2.1 General

4.2.1.1 The design of hull structure and construction shall 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.

4.2.2 Construction materials

4.2.2.1 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 4.5.3.

4.2.2.2 Proposals to use any other material shall be submitted to the Survey Organisation for consideration and approval. When a Survey Organisation considers it does not have the necessary expertise to deal with vessels of the hull material proposed, the BMA shall be consulted with regard to the procedures to be adopted.

4.2.2.3 The hull of a vessel which has been surveyed and certificated by a Bahamas Load Line Assigning Authority shall be acceptable, subject to presentation of a Certificate of Construction.

4.2.2.4 Bahamas Load Line Assigning Authorities, in addition to the BMA, are the Recognised Organisations listed in Marine Notice 002.

4.2.2.5 A vessel which has not been built under the survey of a Bahamas Load Line Assigning Authority will be considered to be of adequate strength after a satisfactory examination by a Survey Organisation and if it has been built:

.1 in accordance with the hull certification standards for small vessels ISO 12215, or any other recognised by one of the Survey Organisations; or

.2 in general accordance with the standards of a vessel which has a record of at least five years' history of safe operation in an area where the sea and weather conditions are no less severe than those likely to be encountered in the intended area of operation.

4.2.2.6 A vessel not built in accordance with either Section 4.2.2.3 or 4.2.2.5 may be specially considered, provided that full information (including calculations, drawings, details of materials and construction) is presented to and approved by a Survey Organisation.

4.2.2.7 A vessel with an existing certificate at the date of coming into force of the Code, or in possession of a valid Load Lines Certificate or Load Lines Exemption Certificate appropriate to the operational category shall continue to be considered of adequate strength for its existing category.

4.3 Decks

4.3.1 Weather deck

4.3.1.1 A watertight weather deck referred to in Section 4.1.1 shall 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 12.)

4.3.1.2 A weather deck may be stepped, recessed or raised provided the stepped, recessed or raised portion is of watertight construction.

4.3.2 Recesses

4.3.2.1 For water freeing arrangements generally, see Section 6 and for freeboard requirements, see Section 12.

4.3.2.2 For motor vessels, a recess in a weather deck complying with Section 4.3.1.1, shall be of watertight construction and have means of drainage capable of efficient operation when the vessel is heeled to 10°. Such drainage is to have an effective area, excluding grills and baffles, of at least $20cm^2$ for each cubic metre of volume of recess below the weather deck.

4.3.2.3 For sailing vessels, recesses in the weather deck shall be of watertight construction and have:

.1 a total volume (V_c) which does not exceed the value obtained from the following formula:

$$V_1 + V_2 + V_{...} + V_n \leq 0.1 \times length\ of\ vessel \times breadth\ of\ vessel \times \frac{F_1 + F_2 + F_{...} + F_n}{n}$$

Where:
V is the volume of the recess
F is the freeboard abreast the recess
n is the number of recesses considered.

.2 means of drainage capable of efficient operation when the vessel is heeled to 30°. Such drainage to have an effective area, excluding grills and baffles, of at least 10cm^2 for a vessel operating in Area Category 2, 3 or 4 and of at least 20cm^2 for a vessel operating in Area Category 0 or 1.

4.3.2.4 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 shall comply with ISO 11812 for the relevant design category as shown in the table in Section 11.7.5

4.3.2.5 If a recess is provided with a locker which gives direct access to the interior of the hull, the locker shall be fitted with weathertight cover(s). In addition, the cover(s) to the locker shall be permanently attached to the vessel's structure and fitted with efficient locking devices to secure the cover(s) in the closed position.

4.4 Watertight Bulkheads

4.4.1 The strength of a watertight bulkhead and the effectiveness of any alternative means shall be adequate for the intended purpose and to the satisfaction of the Survey Organisation.

4.4.2 When pipes, cables, etc penetrate watertight bulkheads, they shall be provided with valves and/or watertight glands, as appropriate.

4.4.3 A doorway fitted in a watertight bulkhead shall 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 skipper. A notice shall be fitted to both sides of the door **"To be kept closed at sea, open for access only"**.

4.4.5 Sliding watertight doors, where fitted, are to be provided with suitable safety provision to avoid injury to personnel by closure of the door.

4.5 Inflatable Boats

4.5.1 The following requirements apply to an inflatable or rigid inflatable boat, other than a tender (dinghy) covered by Section 23.

4.5.2. General

4.5.2.1 Generally, an inflatable boat or 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) shall be of a design and construction which would meet the requirements of Chapter IV of the LSA Code which are appropriate to the type of boat and subject to the variations which are given in the Code.

4.5.2.2 In addition, an inflatable boat or rigid inflatable boat may only be considered for operations in Area Category 2 or 3, if additionally fitted with a permanent substantial enclosure for the protection of persons on-board and purpose designed, subject to approval by the Survey Organisation. For Category 3 operation only, alternative provision for enclosures may be considered, with operational/seasonal limitations. Such cases shall be agreed by the BMA.

4.5.2.3 The structure of the rigid hull of a rigid inflatable boat may alternatively be assessed in accordance with Section 4.2.2.

4.5.2.4 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.

4.5.2.5 A boat shall be of sufficient strength to withstand the sea and weather conditions likely to be encountered in the intended area of operation.

4.5.2.6 A boat which meets these requirements may be accepted if provided with adequate reserves of buoyancy and stability for the vessel to survive the consequences of swamping, when loaded with all the vessels' equipment, fuel, activity related equipment (e.g. diving equipment) and number of persons for which it is to be certificated. (See Section 11 and 12 for applicable standard).

4.5.3 *Construction materials*

4.5.3.1 For boats complying with Section 4.5.2.1, materials shall satisfy the requirements of Chapter IV of the LSA Code including ISO 15372:2000, except that fire–retarding characteristics are not required for the hull material.

4.5.3.2 For boats complying with Section 4.5.2.2, materials shall satisfy the requirements of ISO 6185 Part 2 or Part 3 as appropriate to the engine size.

4.5.3.3 A new boat of a type certified as a rescue boat under the European Union Marine Equipment Directive (MED) by a BMA Recognised Organisation 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, may be accepted on a case by case basis as complying with the construction requirements of the Code.

4.5.3.4 A new boat which is not built in accordance with either Section 4.5.2.1 or 4.5.2.2 may be specially considered, provided that full information (including calculations, drawings, details of materials and construction) is presented to and approved by the Survey Organisation.

4.5.3.5 A permanent shelter provided for the protection of persons on-board shall be of construction adequate for the intended purpose and the intended area of operation.

4.5.4 *Testing*

4.5.4.1 The following shall be applied during the life of the certificate:

.1 Annually (by the owner/managing agent) - An airtightness test as follows:

a) Inflate each compartment of the boat individually to 120% of the safe working pressure.

b) 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.

c) Check that after 30 minutes the pressure is still at 120%.

d) Inflate all compartments to the safe working pressure and record the ambient temperature. After 24 hours in this condition, pressures shall be rechecked and the ambient temperature retaken. and then check that the pressure is not less than 100% of working pressure.

e) A declaration shall be sent to the Survey Organisation on completion.

.2 At the renewal survey, testing shall be conducted to the satisfaction of the Survey Organisation by a competent person in accordance with the manufacturer's recommendations.

4.6 Asbestos Containing Materials

4.6.1 The installation of materials that contain asbestos ("Asbestos containing materials"/"ACMs") has been prohibited, except for some vanes, joints and insulation, since 01 July 2002 and any installation of ACMs has been prohibited, without exceptions, since 01 January 2011.

4.6.2 Ships built before 01 July 2002 are allowed to have ACMs on board. However, the ACMs are only allowed as long as they do not pose a risk to the crew's health. The crew should be aware of the dangers of asbestos and should know how to deal with asbestos in case disturbance of the ACMs cannot be avoided .

4.6.3 Despite the clear and unambiguous prohibition of ACMs, asbestos is still found on various locations on board ships. During inspections, ACM has been found in such places as fire blankets, joints and insulation materials, types of sealants, friction material for brakes, wall and ceiling coverings, cords, remnants, electric fuses, etc. Moreover, ships that initially were free of asbestos appear to have asbestos on board as a result of repairs at shipyards and/or of purchasing spare parts at a later stage.

4.6.4 When asbestos is detected on board, action should be taken to have it removed. The removal – by professional asbestos removal companies – should take place within a time frame of 3 years from the date when the contravention is found.

4.6.5 The Survey Organisation may apply to the BMA for authorisation to issue an exemption for a maximum period of 3 years from the date of the ACM being discovered. The crew should be made aware of which components contain asbestos and provided with relevant instructions and equipment to protect them from asbestos exposure.

5 WEATHERTIGHT INTEGRITY

5.1 General requirements

5.1.1 Vessels shall be designed and constructed in a manner which will prevent the ready ingress of sea water and comply with the requirements of this section.

5.1.2 For strength and watertightness purposes only, the requirements of ISO 12216 are considered acceptable.

5.2 Hatchways and hatches

5.2.1 General requirements

5.2.1.1 A hatchway which gives access to spaces below the weather deck shall be of efficient construction and be provided with efficient means of weathertight closure.

5.2.1.2 A cover to a hatchway shall 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.

5.2.1.3 A hatchway with a hinged cover which is located in the forward portion of the vessel shall normally have the hinges fitted to the forward side of the hatch, as protection of the opening from boarding seas. A hatch with the hinges on the after side of the hatch shall 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, e.g. anchor lockers.

5.2.1.4 Hatches which are used for escape purposes shall be capable of being opened from both sides.

5.2.1.5 Hatches in recessed or stepped decks of vessels described in 4.3.1.2, that provide access to sea inlet valves, shall have access openings at least 300mm above the minimum freeboard to deck (see 12.2.2), or the sea inlet valves fitted with remote closing devices.

5.2.2 Hatchways which are open at sea

5.2.2.1 In general, hatches shall be kept secured closed at sea. However, a hatch (other than one referred to in Section 5.3.2) which is to be open at sea for lengthy periods shall be:

.1 kept as small as practicable, but never more than 1m^2 in plane area at the top of the coaming;

.2 located on the centre line of the vessel or as close thereto as practicable;

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

5.3 Doorways and Companionways

5.3.1 Doorways located above the weather deck

5.3.1.1 A doorway located above the weather deck which gives access to spaces below shall be provided with a weathertight door. The door shall 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.

5.3.1.2 A doorway shall be located as close as practicable to the centre line of the vessel. However, if hinged and located in the side of a house, the door shall be hinged on the forward edge. Doors using articulated systems shall be specially considered, in order to provide an equivalent arrangement.

5.3.1.3 A doorway which is either forward or side facing shall 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.

5.3.2 *Companion hatch openings*

5.3.2.1 A companion hatch opening from a cockpit or recess which gives access to spaces below the weather deck shall be fitted with a coaming or washboard, the top of which is at least 300mm above the sole of the cockpit or recess.

5.3.2.2 When washboards are used to close a vertical opening they shall be so arranged and fitted that they will not become dislodged.

5.3.2.3 The maximum breadth of the opening of a companion hatch shall not exceed 1 metre.

5.4 Skylights

5.4.1 A skylight shall be of efficient weathertight construction and shall 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.

5.4.2 When a skylight is an opening type it shall be provided with efficient means whereby it can be secured in the closed position.

5.4.3 A skylight which is provided as a means of escape shall be capable of being opened from both sides.

5.4.4 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” shall be provided which can be efficiently secured in place in event of breakage of the glazing.

5.5 Portlights and Windows

5.5.1 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 shall be of efficient construction which provides weathertight integrity (and be of strength compatible with size) for the intended area of operation of the vessel.

5.5.2 A portlight or window shall 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.

5.5.3 Portlights fitted in the hull of the vessel below the level of the weather deck shall be either non-opening or of a non-readily opening type, have a glazed diameter of not more than 250mm, or equivalent area, and be in accordance with a standard recognised by the BMA. Portlights of the non-readily opening type must be secured closed when the vessel is in navigation. Proposals to accept portlights, to a recognised standard, greater than 250mm diameter, up to a maximum of 400mm or equivalent area, may be considered, with due regard to their fore and aft, and vertical positioning, to the satisfaction of the Survey Organisation. Proposals for larger portlights may be considered by the BMA.

5.5.4 Portlights, windows and their frames shall meet the appropriate Marine Standards defined in equivalent National or International Standards or Classification Society Rules.

5.5.5 A portlight fitted below the weather deck and not provided with an attached deadlight shall be provided with a “blank” (the number of blanks shall 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 shall be of suitable material and strength to the satisfaction of the Survey Organisation. Such a “blank” is not required for a non-opening portlight which satisfies Section 5.5.2.

5.5.6 A window fitted in the main hull below the weather deck shall meet the requirements of Section 5.5.2 or be provided with a blank meeting the requirements of Section 5.5.7.

5.5.7 In a vessel which operates more than 60 miles from a safe haven, portable “blanks” for windows shall be provided (the number of blanks shall 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. Such a “blank” is not required for a window which satisfies Section 5.5.2.

5.5.8 Wheelhouse windows and their frames shall meet the requirements of Section 5.5.4, having due regard to the increased thickness of windows comprising one or more laminations in order to achieve equivalent strength. Polarised or tinted glass shall not be used in windows provided for navigational visibility (although portable tinted screens may be provided for nominated windows).

5.6 Ventilators and Exhausts

5.6.1 A ventilator shall be of efficient construction and, where situated on the weather deck and not complying with Section 5.6.3, shall be provided with a readily available means of weathertight closure, consideration shall be given to requirements of Fire Protection (Section 14).

5.6.2 A ventilator shall be kept as far inboard as practicable and the height above the deck of the ventilator opening shall be sufficient to prevent the ready admission of water when the vessel is heeled. (See Sections 11.3, 11.4, 11.8 and 11.10.)

5.6.3 A ventilator which must be kept open, e.g. for the supply of air to machinery or for the discharge of noxious or flammable gases, shall be specially considered with respect to its location and height above deck having regard to Section 5.6.2 and the downflooding angle. (See Sections 11.3, 11.4, 11.8, and 11.10.)

5.6.4 Motor vessels which are fitted with engine air intakes in the hull side, which do not satisfy the requirements of the Code may be accepted by a Survey Organisation, but restrictions on operations may be necessary.

5.6.5 An engine exhaust outlet which penetrates the hull below the weather deck shall 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.

5.7 Air Pipes

5.7.1 When located on the weather deck, an air pipe shall 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 11.3, 11.4, 8and 11.10.)

5.7.2 An air pipe, of greater than 10mm inside diameter, serving a fuel or other tank shall 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.

5.7.3 An air pipe serving a fuel tank (also see Section 7.4.4) or other tank, where provided with a closing appliance, shall be of a type which will prevent excessive pressure on the tank boundaries. Provision shall be made for relieving a vacuum when tanks are being drawn from or emptied.

5.8 Sea Inlets and Discharges

5.8.1 An opening below the weather deck shall be provided with an efficient means of closure.

5.8.2 When an opening is for the purpose of an inlet or discharge below the waterline it shall be fitted with a seacock, valve or other effective means of closure which is readily accessible.

5.8.3 When an opening is for a log or other sensor, which is capable of being withdrawn, it shall be fitted in an efficient watertight manner and provided with an effective means of closure when such a fitting is removed.

5.8.4 Inlet and discharge pipes from marine toilets shall be provided with shell fittings as required by Section 5.8.2. 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 shall be provided.

5.8.5 For sailing vessels, overboard inlet and discharge pipes from marine toilets or holding tanks shall be looped up within the hull to the underside of the deck.

5.9 Materials for Valves and Associated Piping

5.9.1 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, shall be normally of steel, bronze, copper, or other non-brittle fire resistant material or equivalent.

5.9.2 When plastic piping is used it shall be of good quality and of a type suitable for the intended purpose.

5.9.3 Flexible or non-metallic piping, which presents a risk of flooding, fitted in an engine space or fire risk area shall be efficiently insulated against fire, or be of fire resistant material, e.g. ISO Standard 7840 or exhaust quality rubber hosing, or a means shall be provided to stop the ingress of water in the event of the pipe being damaged, operable from outside the space. (See Section 5.9.1 for valve requirements.)

6 WATER FREEING ARRANGEMENTS

6.1 General Requirements

6.1.1 When a deck is fitted with bulwarks such that shipped water may be trapped behind them, the bulwarks shall 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.

6.2 Motor Vessels

6.2.1 In a motor vessel, the area of freeing ports shall 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.

6.3 Sailing Vessels

6.3.1 In a sailing vessel the area of freeing ports shall be at least 10% of that part of the bulwark area which extends for 2/3 of the vessel's length amidships. A freeing port shall be located in the lower third of the bulwark height, as close to the deck as practicable. A freeing port shall be fitted with a grid which has a spacing of not more than 50mm in any direction.

6.3.2 Where the average height of the bulwark over its length does not exceed 150mm, freeing ports will not be required, however attention shall be paid to suitable drainage arrangements.

6.4 General - All Vessels

6.4.1 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:

$$FP_{REQ} = FP_{MAX} \times \left({}^{A_{ACT}}/_{A_{MAX}}\right)$$

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

6.4.2 When a non-return shutter or flap is fitted to a freeing port it shall have sufficient clearance to prevent jamming and any hinges shall have pins or bearings of non-corrodible material.

6.4.3 A decked vessel which does not comply with the freeboard requirements of Section 12, shall be treated as an open boat and be provided with bilge pumping in accordance with Section 10.4.

6.4.4 In a vessel where freeing ports cannot be fitted, other efficient means of clearing trapped water from the vessel shall be provided to the satisfaction of the Survey Organisation.

6.4.5 Structures and spaces considered to be non-weathertight shall be provided with efficient drainage.

6.4.6 Where cargo is to be stowed on deck, the stowage arrangement shall be such as to not impede the free flow of water from the deck.

6.4.7 A vessel intended to operate in sea areas where ice accretion can occur shall be specially considered with regard to water freeing arrangements. (Also see Section 11.1.1.6.)

7 MACHINERY

7.1 General Requirements

7.1.1 Generally, machinery installations shall comply with the requirements given below. Other installations proposed may be specially considered, provided that full information is presented to and approved by the BMA.

7.1.2 In motor vessels, the main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the vessel shall be designed to operate when the vessel is upright and when inclined at any angle of heel and trim up to and including 15 degrees and 7.5 degrees respectively either way under static conditions.

7.1.3 In sailing vessels, the main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the vessel shall be designed to operate when the vessel is upright and when inclined at any angle of heel up to and including 15 degrees either way under static conditions and 22.5 degrees either way under dynamic rolling conditions and simultaneously inclined 7.5 degrees by bow or stern under dynamic pitching conditions.

7.2 Diesel Engines

7.2.1 A vessel fitted with either an inboard or an outboard diesel engine shall be provided with an engine suitable for marine use and with sufficient fuel tankage for its area of operation.

7.3 Petrol Engines

7.3.1 A petrol engine may be accepted provided that the engine is a suitable outboard type.

7.3.1.1 A vessel of any type may be fitted with a small engine (usually less than 5 horsepower (~3.7kW)) 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.

7.3.1.2 Vessels other than inflatable boats shall supply fuel to the engine from either:

.1 a permanently installed fuel tank constructed to an appropriate standard[5] and in the case of vessels fitted with a watertight weather deck shall have arrangements such that spillage during fuel handling will drain directly overboard; or

.2 a portable tank of 27 litres or less in capacity complying to an appropriate standard[6].

7.3.1.3 Inflatable boats shall supply fuel to the engine from a portable tank of 27 litres or less in capacity complying to an appropriate standard[7].

[5] Such as ISO 10088 - Small Craft. Permanently installed fuel systems and fixed fuel tanks
[6] Such as ISO 13591 Small craft. Portable fuel systems for outboard motors
[7] Such as ISO 13591 Small craft. Portable fuel systems for outboard motors

7.3.2 In locations where an accumulation of hydrocarbon vapours is likely to occur, a suitable hydrocarbon gas detector shall 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 shall not be capable of causing ignition.

7.3.3 A vessel shall be provided with sufficient fuel tankage for its area of operation, spare portable petrol containers must not be carried onboard unless it is judged to be essential to assure the safe completion of a voyage or excursion (see Section 7.7).

7.3.4 Attention is drawn to the electrical arrangement requirements (Section 8.6).

7.4 Installation

7.4.1 The machinery, fuel tank(s) and associated piping systems and fittings shall be of a design and construction adequate for the service for which they are intended. These shall 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.

7.4.2 Means shall 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, shall be fitted in the fuel feed pipe as close as possible to the fuel tank.

7.4.3 Fuel filling and venting pipes shall be constructed of fuel compatible non-kinking material, adequately supported and of sufficient dimensions to prevent spillage during filling.

7.4.4 A venting pipe shall 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:

.1 water ingress - by a goose neck or other efficient means; and

.2 for petrol engines or where there is a risk from flame ingress - by a suitable gauze diaphragm which can be detached for cleaning.

7.4.5 In a fuel supply system unit, where a flexible section of piping is introduced, the flexible pipes shall be fire resistant/metal reinforced or otherwise protected from fire and constructed to an appropriate standard[8]. The flexible pipes shall be secured by either metal hose clamps or permanently attached end fittings (e.g. swaged sleeve or sleeve and threaded insert). Where hose clamps are used, the fitting to which the flexible pipe attaches shall have a bead, flare, annular grooves or other means of preventing slippage, the anti-slippage arrangement shall not provide a path for fuel leakage.

[8] Such as ISO 7840 Small Craft. Fire resistant fuel hoses

7.4.6 Any flexible piping, if required for flexible connections, shall conform to an appropriate standard, be certified for use with petrol (hydrocarbons), be kept as short as possible and be protected from inadvertent damage. Flexible piping shall be installed in a manner to allow access along its length. Proposals for a more extensive use of flexible piping shall be submitted to the BMA for approval on an individual basis.

7.4.7 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 shall be located so that it can be easily seen and protected against heat and accidental damage.

7.5 Engine Starting and Stopping

7.5.1 An engine shall be provided with either mechanical, hand starting or electric starting with independent batteries, or other means of starting acceptable to the Survey Organisation.

7.5.2 When the sole means of starting is by battery, the battery shall be in duplicate and connected to the starter motor via a changeover switch so that either battery can be used for starting the engine. Charging facilities for the batteries shall be available. Under normal circumstances it is not recommended to discharge both batteries in parallel.

7.5.3 All internal combustion machinery shall have a secure means of remote stopping from outside the engine space.

7.5.4 All inflatable boats, boats fitted with a buoyant collar, and open boats that achieve planning speed, when fitted with remote throttle controls, shall be fitted with a kill-cord, to be used at all times during navigation.

7.6 Portable Equipment

7.6.1 When portable equipment powered by a petrol engine is provided, the unit, unless fully drained of fuel, shall normally be stored on the weather deck.

7.6.1.1 Alternatively it may be stowed in a deck locker or protective enclosure which is to the satisfaction of the Survey Organisation and meets the following requirements:

.1 vapour tight to the vessel's interior;

.2 not openable from the vessel's interior; and

.3 adequately drained overboard and ventilated to atmosphere.

7.6.1.2 A safety warning sign shall be displayed with details of appropriate precautions to be taken when filling the fuel tank.

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

7.7 Stowage of Petrol

7.7.1 When spare petrol is carried on-board in portable containers, for any purpose, the quantity shall be kept to a minimum, the containers shall be clearly marked and shall normally be stowed on the weather deck where they can readily be jettisoned and where spillage will drain directly overboard.

7.7.2 In small vessels where Section 7.7.1 is not practicable, a 5-litre container of petrol may be stowed in a deck locker which meets the requirements of Section 7.6.1.1.

8 ELECTRICAL ARRANGEMENT

8.1 General

8.1.1 Electrical arrangements shall 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 shall have special earthing arrangements to reduce such risks.

8.1.2 The electrical systems described in this section are the most common types suitable for small vessels, i.e. 12V to 24V direct current systems. However, a vessel may have alternating current electrical equipment of much higher voltage, in which case compliance with an applicable standard will be necessary.

8.1.3 For general guidance, a number of the most common standards which are appropriate to a small vessel are listed in Yacht Notice 10. Other standards which are considered more appropriate and safer for a particular application may be used, provided they are acceptable to the Survey Organisation.

8.2 Systems

8.2.1 Systems shall 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.

8.2.2 A system in which there is no intentional connection of the circuit to earth (an insulated system) shall be provided with double pole switches, except that single pole switches may be used in the final sub-circuit.

8.2.3 Single pole switches are only acceptable when used in the ‘live’ (+) conductor in a system with one pole earthed. Fuses shall not be installed in an earthed conductor.

8.2.4 All circuits, except the main supply from the battery to the starter motor and electrically driven steering motors, shall be provided with electrical protection against overload and short circuit, (i.e. fuses or circuit breakers shall be installed). The rating of over current protection devices shall not exceed the rated current capacity of the conductor being protected. Short circuit protection shall 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 shall be established to enable the engine to be started in the event of a damaged fuse.

8.2.5 Steering circuits, the loss of which would lead to steering failure, shall have an overload alarm in lieu of overload protection (this does not apply to auto-pilot motors). However, all circuits shall be protected against short circuit events.

8.3 Lighting

8.3.1 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) shall be provided. This alternative source of lighting shall be sufficient to:

.1 enable persons to make their way to the open deck;

.2 illuminate survival craft launching and embarkation;

.3 illuminate man-overboard rescue equipment and rescue areas;

.4 permit work on essential machinery.

8.4 Batteries

8.4.1 Battery system requirements

8.4.1.1 Batteries and battery systems for engine starting and radio equipment as required by Section 7.5.1, 7.5.2 and 16.2.6 , and any other essential services shall comply with the minimum requirements of this Section

8.4.1.2 Where batteries are used for propulsion and/or vessel electric power supply purpose during ship operations, the Battery System shall also consider the guidelines provided in Section 34.

8.4.1.3 The battery terminals shall be protected against accidental contact with metallic objects.

8.4.1.4 Battery charging systems shall be fitted with circuitry to prevent overcharging.

8.4.1.5 A battery cut-out switch shall be provided for all systems. It is preferred that this switch acts as an isolator, i.e. 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.

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

8.4.1.7 In the case of a sailing vessel, batteries shall be of the sealed type to prevent electrolyte loss in the event of a knockdown or immersion.

8.4.2 Battery stowage

8.4.2.1 All batteries shall be secured firmly to avoid movement when the vessel is subjected to sudden acceleration or deceleration, a large angle of heel, trim and in the case of sailing vessels, knockdown or inversion.

8.4.2.2 Where the maximum charging power output is less than 0.2 kW the batteries may be located in any suitable space without any special container requirements.

8.4.2.3 Where the maximum charging power output is between 0.2 and 2.0 kW the batteries shall be located in the machinery space or other well-ventilated space in a box or locker.

8.4.2.4 Where the maximum charging power output exceeds 2 kW the batteries shall be placed in a suitably ventilated dedicated compartment within the vessel or a locker on the open deck, in either case stowage space is to be for batteries only.

8.4.3 *Ventilation*

8.4.3.1 To ensure that any evolved hydrogen is expelled, battery compartments, lockers and containers shall be exhausted from the highest point of the space and air supplied at a level below the top of the batteries.

8.4.3.2 If mechanical means are employed to ventilate a battery compartment directly, then the components must not be a potential source of ignition. Reference shall be made to the requirements of IECEx[9] or equivalent[10] standards for equipment intended for use in potentially explosive atmospheres.

8.5 Cables

8.5.1 Electrical cables shall be constructed to a recognised standard for marine use in small vessels.

8.5.2 Cables which are not provided with electrical protection shall be kept as short as possible and shall be short circuit proofed, e.g. single core with an additional insulated sleeve over the insulation of each core. Normal marine cable, which is single core, will meet this requirement without an additional sleeve since it has both conductor insulation and a sheath.

8.5.3 When selecting cables, particular attention shall be given to environmental factors such as temperature and contact with damaging substances, e.g. polystyrene, which degrades PVC insulation.

8.5.4 Adequate provision shall be made for securing electrical connections, e.g. by use of locking washers.

8.6 Hazardous Spaces

8.6.1 Where practicable, electrical equipment shall not be installed in a space where petroleum vapour or another 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.

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[9] International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres (IECEx System)

[10] Such as the ATEX Directive

8.6.2 Any compartment which contains a gas consuming appliance or any compartment into which flammable gas may leak or accumulate, shall be provided with a hydrocarbon gas detector and alarm. The detector and alarm shall be designed to comply with a recognised standard in accordance with Section 8.6.1. (Refer to Section 14.5).

8.7 Lightning Protection

8.7.1 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 shall be made to ISO 10134.

9 STEERING GEAR, RUDDER & PROPELLER SYSTEMS

9.1 Steering

9.1.1 A vessel shall be provided with efficient means of steering.

9.1.2 The control position shall be located so that the person conning the vessel has a clear view for the safe navigation of the vessel.

9.1.3 When steering gear is fitted with remote control, arrangements shall 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 Survey Organisation:

.1 a tiller to fit the head of the rudder stock; or

.2 a rod attachment which may be fitted to a Z-drive framework; or

.3 a steering oar; or

.4 in the case of twin-screw vessels manipulation of power distribution between the drives. In the case of twin stern-drive arrangements, means shall be provided to lock the drives in the midships position; or

.5 in the case of a vessel fitted with outboard(s), a means to control the direction of thrust.

9.1.4 If emergency steering is impractical, alternative safety measures and/or procedures to deal with any steering failure situation shall be agreed with the Survey Organisation. The Survey Organisation may consider the application of restrictions to the service area of the vessel.

9.1.5 Steering systems shall comply with an appropriate standard[11] for small craft steering systems.

9.2 Rudder System

9.2.1 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 shall be adequate for the operating conditions of the vessel. Recognised design standards shall be used.

9.2.2 Construction and fittings shall be to an appropriate standard, to the satisfaction of the Survey Organisation.

[11] Such as ISO 13929 Small craft. Steering gear. Geared link systems; and ISO 10592 Small craft. Hydraulic steering systems

9.3 Propeller System

9.3.1 As appropriate to the vessel, propeller line shaft(s) construction materials and design in total (including shaft brackets, propeller securing, bearings, sterntube and thrust block) and supporting structures shall be adequate for the operating conditions for the vessel. Recognised design standards shall be used.

9.3.2 Construction and fittings shall be to an appropriate standard, to the satisfaction of the Survey Organisation.

10 BILGE PUMPING

10.1 General Requirements

10.1.1 A vessel shall 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.

10.1.2 Provided the safety of a vessel is not impaired, the Survey Organisation may permit dispensation from the means of pumping or drainage of particular compartments.

10.1.3 A bilge pump (other than a portable pump) shall be capable of being operated with all hatchways and companionways closed.

10.1.4 When considered necessary to protect the bilge suction line from obstruction, an efficient strum box shall be provided.

10.1.5 When considered necessary, to prevent back flooding, bilge suction valves shall be of non-return type.

10.1.6 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 Survey Organisation.

10.1.7 Reference shall be made to Section 21.2 which contains requirements for prevention of pollution of the sea.

10.1.8 Unless otherwise stated, pump capacities shall be 30 litres per minute.

10.2 Vessels Carrying 16 or More Persons or Operating in Area Category 0 or 1

10.2.1 A vessel shall have at least one hand bilge pump and one engine driven or independent power bilge pump, situated in not less than two separate spaces. All pumped spaces shall be capable of being drained after the failure of one pump.

10.2.2 For motor vessels, all compartments shall be able to be drained when the vessel is heeled up to an angle of +/- 10 degrees.

10.3 Vessels Carrying 15 or Less Persons and Operating in Area Category 2 to 6

10.3.1 Unless otherwise specified in Section 10.4, a vessel shall be provided with at least two bilge pumps, one of which may be power driven situated in two separate spaces. All pumped spaces shall be capable of being drained after the failure of one pump.

10.4 Open Boats, Inflatable Boats and Boats with a Buoyant Collar

10.4.1 All open boats shall carry a hand bailer or bucket in addition to the bilge pumping requirements in Section 10.2 and 10.3.

10.4.3 Buckets required for this section may also be counted in any requirements for buckets given in Section15.

10.5 Bilge Alarm

10.5.1 A bilge alarm shall be fitted:

.1 in any watertight compartment containing propulsion machinery; or

.2 in any other compartment likely to accumulate bilge water, i.e. where a skin fitting is present, excluding void spaces, where the bilge level cannot be readily seen

10.5.2 To prevent pollution, compartments containing potential pollutants shall not be fitted with auto-start bilge pumps.

10.5.3 An auto-start bilge pump serving a clean compartment where a significant quantity of water could accumulate unnoticed, shall be fitted with an audible alarm at the control position(s). Shall a number of such locations/alarms be present, then visual alarm indication shall also be fitted to enable rapid location of the source of the alarm.

10.5.4 The alarm shall provide an audible warning, and preferably a visual warning also, at the control position.

11 STABILITY

11.1 All Yachts

11.1.1 General

11.1.1.1 The standard of stability to be achieved by a new vessel shall be dependent on the maximum number of persons permitted to be carried and the intended area of operation.

11.1.1.2 The following vessels are required to be provided the BMA Yacht Stability Information Booklet which is to be approved by the Survey Organisation:

.1 vessels operating in Category 0 or 1; or

.2 vessels carrying 16 or more persons

11.1.1.3 Motor vessels are not required to carry a BMA Yacht Stability Information Booklet if the stability is assessed under section 11.3.8 using ISO 12217 Part 1.

11.1.1.4 A vessel carrying 15 or fewer persons and operating in Area Categories other than 0 or 1 shall either comply with Section 11.1.1.2 or be subject to a simplified assessment of stability, and is not required to be provided with approved stability information.

11.1.1.5 If a vessel cannot meet the stability criteria given within Section 11, it shall be specially considered by the Survey Organisation, and such cases shall be reported to the BMA.

11.1.1.6 The stability of sailing vessels fitted with non-fore and aft rigs, or moveable/variable ballast is to be specifically considered on application to the BMA.

11.1.1.7 Stability of a vessel which will operate in sea areas where ice accretion can occur shall be specially considered by the BMA with regard to icing allowance and stability standard, and in compliance with the requirements of the Polar Code.

11.1.1.8 For stability requirements for:

.1 an inflatable vessel or a vessel fitted with a buoyant collar, see Section 11.5.

.2 a decked vessel fitted with a lifting device, see Section 11.10

11.1.1.9 Sailing multihull yachts shall be provided with the BMA Yacht Stability Information Booklet approved by the Survey Organisation.

11.1.1.10 Where a monohull vessel cannot comply with the specified criteria, due to its hull form displaying stability characteristics similar to that of a multihull vessel, the stability criteria for a multihull vessel may be applied, as appropriate for sailing or motor vessels.

11.1.1.11 A motor multihull type vessel failing to comply with the criteria of either Section 11.3.6 or 11.3.7 may be given special consideration. In such a case, calculations shall be submitted to the BMA for assessment.

11.1.1.12 All vessels, other than those vessels deemed unsuitable for carriage of the booklet by the Survey Organisation (i.e. vessels with no cabin or shelter), are required to carry the relevant copy of the BMA Yacht Stability Information Booklet (Motor or Sail). 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 BMA. Although they contain generic safety advice, the stability and freeboard data already generated during the survey process shall be appended to the booklet in the relevant section. It is the responsibility of the Survey Organisation to supply this information, and the owner/managing agent is to ensure this data is included.

11.2 Damage Survivability

11.2.1 Monohull Vessels

11.2.1.1 This section applies to all monohull vessels carrying 16 or more persons and those operating in Area Category 0 or 1, with 7 or more persons, subject to minimum safe manning levels being agreed by the BMA.

11.2.1.2 Vessels shall 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 Survey Organisation. Minor damage shall be assumed to occur anywhere in the length of the vessel but not on a watertight subdivision.

11.2.1.3 In assessing survivability, the following standard permeabilities shall 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 Survey Organisation.

11.2.1.4 In the damaged condition, the residual stability shall be such that the angle of equilibrium does not exceed 7 degrees from the upright, the resulting righting lever curve has a range to the downflooding angle of at least 15 degrees beyond the angle of equilibrium, the maximum righting lever within that range is not less than 100mm and the area under the curve is not less than 0.015 metre radians. This damage shall not cause the vessel to float at a waterline less than 75mm from the weatherdeck at any point. Proposals to accept reduced freeboard or immersion of the margin line may be accepted subject to special consideration.

11.2.2 *Multihull vessels*

11.2.2.1 Generally, the requirements of Section 11.2.1 for a monohull vessel shall apply to a multihull motor vessel carrying 16 or more persons or operating in Area Category 0 and 1, with 7 or more persons. Damage and inverted stability requirements for multihull sailing vessels are contained in Section 11.8. If a multihull vessel is of unconventional design or cannot meet the damage criteria given in Sections 11.2.1.3 and 11.2.1.4, the results of the calculations shall be submitted to the BMA for assessment.

11.3 Motor Vessels Complying with Section 11.1.1.2

11.3.1 The lightship weight, vertical centre of gravity (KG) and longitudinal centre of gravity (LCG) of a monohull vessel shall be determined from the results of an inclining experiment.

11.3.2 The LCG of a multihull vessel shall be obtained by a displacement check or by weighing. The KG shall be determined either by calculation or by experimental means, noting however that a conventional inclining experiment may not produce satisfactory results.

11.3.3 The lightship weight may include a margin for growth, up to 5% of the lightship weight at the discretion of the Survey Organisation, positioned at the LCG and vertical centre of the weather deck amidships or KG, whichever is the higher.

11.3.4 Curves of static stability (GZ curves) shall be produced for:-

.1 Loaded departure, 100% consumables;

.2 Loaded arrival, 10% consumables;

.3 Anticipated service conditions; and

.4 Conditions involving lifting appliances (when appropriate).

11.3.4.1 Simplified stability information in the form of a Maximum KG Curve shall be provided, including a worked example to illustrate its use.

11.3.4.2 Maximum free surface moments shall be included within the Loaded Departure condition, and as a minimum, factored according to tank percentage fill for all other conditions.

11.3.5 Generally, buoyant structures intended to increase the range of positive stability shall not be provided by fixtures to superstructures, deckhouse, masts or rigging.

11.3.6 The curves of static stability for the loaded conditions shall meet the following criteria:

.1 the area under the righting lever curve (GZ curve) shall be not less than 0.055 metre-radians up to 30 degrees angle of heel and not less than 0.09 metre - radians up to 40 degrees angle of heel or the angle of downflooding if this angle is less;

.2 the area under the GZ curve between the angles of heel of 30 and 40 degrees or between 30 degrees and the angle of downflooding if this less than 40 degrees, shall be not less than 0.03 metre-radians;

.3 the righting lever (GZ) shall be at least 0.20 metres at an angle of heel equal to or greater than 30 degrees;

.4 the maximum GZ shall occur at an angle of heel of not less than 25 degrees; and

.5 after correction for free surface effects, the initial metacentric height (GM) shall not be less than 0.35 metres.

11.3.7 If a vessel of catamaran or multihull type does not meet the stability criteria given in Section 11.3.6, the vessel shall meet the following criteria:

.1 the area under the righting lever curve (GZ Curve) shall not be less than 0.085 metre-radians up to θ_{GZmax}.when $\theta_{GZmax} = 15°$ and 0.055 metre-radians up to θ_{GZmax} when $\theta_{GZmax} = 30°$.

When the maximum righting lever, GZ_{max}, occurs between θ = 15° and θ = 30° the required area under the GZ Curve up to θ_{GZmax} shall not be less than:

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

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

.2 the area under the righting lever curve between θ = 30° and θ = 40° or between θ = 30° and the angle of downflooding θ_f, if this angle is less than 40°, shall not be less than 0.03 metre-radians;

.3 the righting lever GZ shall not be less than 0.2 metres at an angle of heel of 30 degrees;

.4 the maximum righting lever shall occur at an angle not less than 15 degrees; and

.5 the initial metacentric height GM_o shall not be less than 0.35 metres.

11.3.8 Vessels complying with ISO 12217 Part 1, assessed using Options 1 or 2 of Section 5.3 - `Test and calculations to be applied', may as an alternative, after verification of the stability assessment by the Survey Organisation, be assigned an area of operation in accordance with Section 11.3.9.

11.3.9 Permitted areas of operation.

Permitted Area of Operation	Code Category	ISO 12217 Design Category
Unrestricted	0	A
Up to 150 miles from a safe haven	1	A
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 20 miles from a nominated departure point in in favourable weather and daylight	5	C
Up to 3 miles from a nominated departure point in favourable weather and daylight	6	C

11.4 Motor Vessels Complying with Section 11.1.1.4

11.4.1 A vessel shall be tested in the fully loaded conditions corresponding 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 75kg for the purpose of the test.

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

.1 the angle of heel does not exceed 7 degrees; and

.2 in the case of a vessel with a watertight weather deck extending from stem to stern, as described in Section 4.1.1, the freeboard to deck is not less than 75mm at any point.

.3 The angle of heel may exceed 7 degrees, but shall not exceed 10 degrees, if the freeboard in the heeled condition is in accordance with that required by Section 12 in the upright condition.

11.4.3 Additionally, for vessels over 15 metres in length, the heeling moment applied during the test described in 11.4.1 shall be calculated. Using the formula below, the vessel shall 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 Survey Organisation.

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

Where:
HM = Heeling moment in kilogramme-metres
θ = angle of heel in degrees obtained from the test as defined in 11.4.1
Δ = the displacement of the vessel in kilogrammes, either estimated, or measured and verified by the Survey Organisation

11.4.3.1 In all cases, the maximum permissible weights of persons and/or cargo derived from the tests conducted shall be recorded on the certificate. Vessel loading will be restricted by the position freeboard mark and maximum permissible weight, and thus for the purposes of this test, attention shall be paid to any activity related equipment where this may be significant, e.g. diving equipment.

11.4.4 It shall be demonstrated by test or by calculation that an open boat, when fully swamped, is capable of supporting its full outfit of equipment, the total number of persons for which it is to be certificated and a mass equivalent to its engine and full tank of fuel.

11.4.5 Vessels complying with ISO 12217 Part 1, 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 Survey Organisation, be assigned an area of operation in accordance with Section 11.3.9.

11.5 Inflatable Boats or Boats Fitted with a Buoyant Collar

11.5.1 These requirements apply to an 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 Survey Organisation 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 weights of passengers and/or cargo derived from the tests conducted shall be recorded on the certificate. Vessel loading will be restricted by the position freeboard mark and maximum permissible weight, and thus for the purposes of this test, attention shall be paid to any activity related equipment where this may be significant, e.g. diving equipment.

11.5.2 Stability Tests

11.5.2.1 The tests shall be carried out with all the vessels' equipment, fuel, activity related equipment (e.g. diving equipment) and number of persons for which it is to be certificated, on-board. The engine and equipment may be replaced by an equivalent mass. Each person may be substituted by a mass of 75kg for the purpose of the tests.

11.5.2.2 The maximum number of persons for which a boat is certified shall be crowded to one side, with half this number seated on the buoyancy tube. This procedure shall be repeated with the persons seated on the other side and at each end of the inflatable boat, rigid inflatable boat or vessel with a buoyant collar. For the purposes of these tests any equivalent alternative mass shall be retained at its normal stowage position. In each case the freeboard to the top of the buoyancy tube shall be recorded. Under these conditions the freeboard shall be positive around the entire periphery of the boat.

11.5.3 Damage tests - inflatable boats

11.5.3.1 The tests shall be carried out with all the vessels' equipment, fuel, activity related equipment (e.g. diving equipment) and number of persons for which it is to be certificated, on-board. The engine and equipment may be replaced by an equivalent mass. Each person may be substituted by a mass of 75kg for the purpose of the tests.

11.5.3.2 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. The conditions are:

.1 with forward buoyancy compartment deflated (both sides if appropriate);
.2 with the entire buoyancy, from the centreline at the stem to the transom, on one side of the inflatable boat or rigid inflatable boat deflated.

11.5.3.3 Purely inflatable boats failing to meet Section 11.5.2.1 may be specially considered by the Survey Organisation, taking into account operational service limitations.

11.5.4 *Swamp test*

11.5.4.1 It shall be demonstrated that, when fully swamped, the vessel is capable of supporting its full outfit of 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 full tank of fuel.

11.5.4.2 In the swamped condition the inflatable boat, rigid inflatable boat or vessel with a buoyant collar, shall not be seriously deformed.

11.5.4.3 An adequate means of draining the boat shall be demonstrated at the conclusion of this test.

11.5.5 *Person recovery stability test*

11.5.5.1 Two persons shall recover a third person from the water into the vessel. The third person shall simulate being unconscious and have their back towards the inflatable boat or rigid inflatable boat so as not to assist the rescuers. Each person involved shall wear an approved lifejacket. The vessel shall remain stable throughout the operation and shall not capsize.

11.6 Sailing Monohull Vessels Complying with Section 11.1.1.2

11.6.1 The centre of gravity (KG) of a vessel shall be established by an inclining experiment and curves of static stability (GZ curve) for the loaded departure 100% consumables and loaded arrival 10% consumables shall be produced.

11.6.1.1 The above conditions may include a margin for growth up to 5% of the lightweight, at the discretion of the Survey Organisation, with the VCG positioned at the upper deck amidships.

11.6.1.2 Buoyant structures intended to increase the range of positive stability shall not be provided by fixtures to either a mast, rigging, or superstructure.

11.6.1.3 For standard production series built vessels, the static stability (GZ) may be derived from an inclining experiment conducted on another vessel of the series, subject to corrections for differences in outfit, to the satisfaction of the Survey Organisation.

11.6.1.4 Maximum free surface moments shall be included within the loaded departure condition, and as a minimum, factored according to tank percentage fill for the loaded arrival condition.

11.6.2 The GZ curves required by Section 11.6.1 shall have a positive range of not less than the angle determined by the formula in the table in Section 11.7.5, or 90°, whichever is the greater.

11.6.3 In addition to the requirements of Section 11.6.2, the angle of steady heel obtained from the intersection of a "derived wind heeling lever" curve with the GZ curves referred to in Section 11.6.1 above shall be greater than 15 degrees (see Figure 11.1).

In Figure 11.1:
`DWHL' = the "derived wind heeling lever" at any angle θ degrees
$= 0.5 \times WL0 \times cos^{1.3}\theta$ where $WL0 = \frac{GZ_f}{cos^{1.3}\theta_f}$

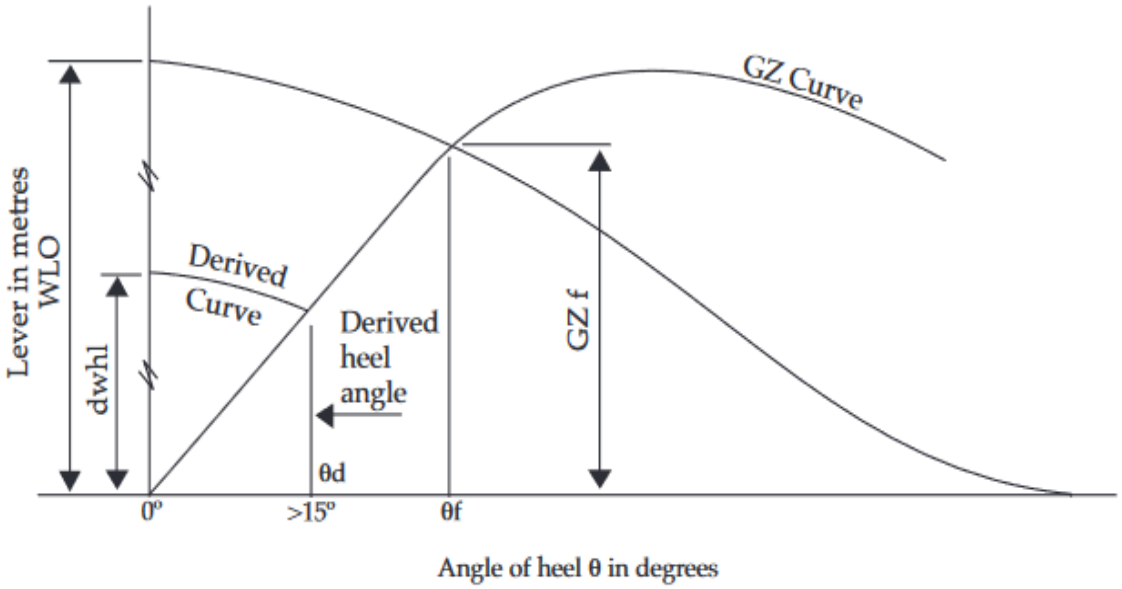


Figure 11.1

Noting that, when using this method:

WL0- is the magnitude of the actual wind heeling lever at 0 degrees which would cause the vessel to heel to the `down flooding angle' (θ_f) or 60 degrees, whichever is least.

GZ_f is the lever of the vessel's GZ at the `down flooding angle' (θ_f) or 60 degrees, whichever is least.

θ_d is the angle at which the `derived wind heeling' curve intersects the GZ curve. (If θ_d is less than 15 degrees the vessel will be considered as having insufficient stability for the purpose of the Code).

θ_f is the `critical down flooding angle' and is deemed to occur when openings having an aggregate area, in square metres, greater than:

$$\frac{Vessel's\ displacement\ in\ tonnes}{1500}$$ are immersed.

Moreover, it is the angle at which the lower edge of the actual opening which results in critical flooding becomes immersed. All openings regularly used for crew access and for ventilation shall be considered when determining the downflooding angle. No opening regardless of size which may lead to progressive flooding shall be immersed at an angle of heel of less than 40 degrees. Air pipes to tanks can, however, be disregarded.

If as a result of immersion of openings in a deckhouse a vessel cannot meet the required standard, those deckhouse openings may be ignored and the openings in the weather deck used instead to determine θ_f. In such cases the GZ curve shall be derived without the benefit of the buoyancy of the deckhouse.

It might be noted that provided that the vessel complies with the requirements of Section 11.6.1, 11.6.2 and 11.6.3 and it is sailed with an angle of heel which is no greater than the 'derived angle of heel', it shall be capable of withstanding a wind gust equal to 1.4 times the actual wind velocity (i.e. twice the actual wind pressure) without immersing the `down flooding openings', or heeling to an angle greater than 60 degrees.

11.6.4 Vessels complying with ISO 12217 Part 2, assessed using Options 1 and 2 of Section 6.1 - `Requirements to be applied', may as an alternative and in lieu of 11.6.2, be assigned a permitted area of operation in accordance with section 11.7.5, provided that the righting lever curve produced for this standard, is verified and corrected in accordance with 11.11 before performing the calculations . In this case the calculated steady heel angle required by 11.6.3 is to be reduced by 10%.

11.6.5 The BMA Yacht Stability Information Booklet t, shall be submitted to, and approved by the Survey Organisation and placed on-board the vessel. The booklet shall include details of the maximum steady angle of heel for the worst sailing condition. The steady angle of heel is to be calculated in accordance with Section 11.6.3 or 11.6.4. The booklet shall also include curves of maximum recommended steady angle of heel for the prevention of down flooding in the event of squall conditions. Details of the development of such curves are given in the BMA Yacht Stability Information Booklet.

11.7 Sailing Monohull Vessels Complying with Section 11.1.1.4

11.7.1 General

11.7.1.1 The stability of a vessel shall be determined by one of the methods discussed below and its area of operation shall be dependent upon the standard which it is shown to achieve.

11.7.2 Vessels without external ballast keels

11.7.2.1 Method 1

.1 The centre of gravity (KG) of a vessel shall be established by an inclining experiment. Static stability (GZ curves) for the loaded departure with 100% consumables and loaded arrival 10% consumables shall be produced.

a. The above conditions may include a margin for growth up to 5% of the lightweight, at the discretion of the Survey Organisation, with the VCG positioned at the upper deck amidships.
b. Buoyant structures intended to increase the range of positive stability shall not be provided by fixtures to either a mast, rigging, or superstructure.
c. For standard production series built vessels, the static stability (GZ) may be derived from an inclining experiment conducted on another vessel of the series,

subject to corrections for differences in outfit, to the satisfaction of the Survey Organisation.

.2 Permitted area of operation

The permitted area of operation is dependent upon a vessel's range of stability as indicated in the table in Section 11.7.5. The range of stability is to at least 90° in all cases.

.3 For vessels operating in Area Category 6, it may be demonstrated by test or calculation, that an open sailing boat when fully swamped is capable of supporting its full outfit of equipment and the total number of persons for which it is to be certificated. Small un-ballasted sailing dayboats are to be capable of being righted by their crew after inversion.

11.7.2.2 Method 2

.1 By the full application verified or performed by a Survey Organisation as required, of ISO12217 Part 2, in accordance with Section 11.7.5.

.2 The permitted area of operation is dependent upon a vessel's assigned Design Category as indicated in the table in Section 11.7.5.

11.7.3 Vessels fitted with external ballast keels

11.7.3.1 The stability assessment of a vessel may be made by any one of the following methods:

11.7.3.2 Method 1

.1 as for vessels without external ballast keels, see 11.7.2.

11.7.3.3 Method 2

.1 by the full application verified or performed by a Survey Organisation as required, of ISO12217 Part 2 in accordance with 11.7.5.

11.7.3.4 Method 3

.1 by the `STOPS' Numeral developed by the Royal Yachting Association (RYA) and discussed in Section 11.7.4.

11.7.3.5 For vessels fitted with one or more top-weight items, examples of which are given below, the ballast ratio shall be modified as follows:

11.7.3.6 Moments are to be taken about the vertical centre of gravity (KG) of the vessel, which is assumed to be at the waterline. The heeling moments attributed to the top-weight items are resolved, and the ballast weight is reduced, using the formula:

$$CBW = \frac{TW \times H}{(DCB + DK/2)}.$$

Where:

CBW is the correction to the ballast weight

TW is the weight of the top-weight items being considered
H is the height of the vertical centre of gravity above the waterline.
DCB is the draught of the canoe body, taken by measuring the maximum draught at 1/8 of the full beam from the centreline in way of the transverse section, at greatest beam.
DK is the depth of the keel, taken as the distance between the draught of the canoe body and the bottom of the keel.

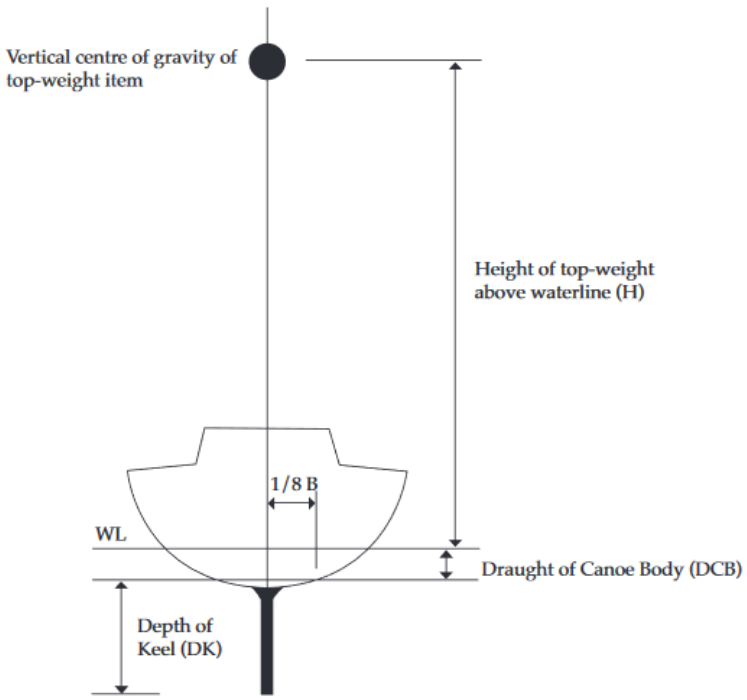


Figure 11.2

Examples of top-weight items are:

- roller furling headsail;
- in-mast or behind-mast roller furling mainsail;
- a radar antenna mounted higher than 30% of the length of the vessel above the waterline.
- Ballast weight reductions are to be conducted to the satisfaction of the Survey Organisation.

11.7.3.7 Permitted area of operation

The permitted area of operation is dependent upon a vessel's range of stability, STOPS Numeral, or Design Category as indicated in the table in 11.7.5.

11.7.4 Assessment using the RYA `STOPS' numeral or use of SSS numeral calculated by the Royal Ocean Racing Club.

11.7.4.1 A vessel can have its area of operation based upon the RYA STOPS Numeral. Information on the derivation of the STOPS numeral may be obtained from the Survey Organisation. Once the STOPS Numeral has been determined, it is necessary to study the table in Section 11.7.5 to ascertain the permitted area of operation.

11.7.4.2 An SSS numeral calculated by the RORC will be accepted in place of a STOPS numeral, provided that it includes a self-righting factor based on an inclining experiment and shown on a valid IRC or IMS rating certificate.

11.7.5 Table showing permitted areas of operation, STOPS Numerals and Design Categories:

		Minimum Required Standard			
Permitted Area of Operation	**Code Category**	**Range of Stability**	**STOPS Numeral**	**ISO2217 Design Category**	**Permitted ISO Stability Assessment Options**
Unrestricted	0	90+60x(24-LOA)/17	N/A	A	1
Up to 150 miles from a safe haven	1	90+60x(24-LOA)/17	N/A	A	1
Up to 60 miles from a safe haven	2	90+60x(24-LOA)/20	30	B	1
Up to 20 miles from a safe haven	3	90+60x(24-LOA)/25	20	B	1
Up to 20 miles from a safe haven in favourable weather and daylight	4	90+60x(24-LOA)/25	20	C	1 and 2
Up to 20 miles from a nominated departure point in in favourable weather and daylight	5	90+60x(24-LOA)/25	20	C	1 and 2
Up to 3 miles from a nominated departure point in favourable weather and daylight	6	90+60x(24-LOA)/25	14	C	1, 2, 5 and 6

Table showing permitted areas of operation, STOPS Numerals and Design Categories.

11.8 Sailing Multihull Vessels

11.8.1 The stability of multihull sailing vessels shall be assessed using ISO 12217 - Part 2, which includes a requirement that the vessel shall float after an inversion without the benefit of any trapped air pockets other than dedicated air tanks or watertight compartments.

11.8.2 A multihull vessel shall be provided with the BMA Yacht Stability Information Booklet, giving details of the maximum advised mean apparent windspeeds for each expected combination of sails that may be set, as derived from ISO 12217 - Part 2. These wind speeds shall be presented in knots, and be accompanied by the note, **"In following winds, the tabulated safe wind speed for each sail combination shall be reduced by the boat speed".**

11.8.3 For the purposes of the application of ISO 12217 - Part 2, the maximum safe wind speed shall be taken as the lesser of the values calculated by the formulae below, instead of those given in G.1 of the ISO standard. Both pitch and roll moments shall be calculated for all vessels.

$$v_w = 1.5\sqrt{\frac{LM_R}{A'_s\, h\, cos\emptyset_R + A_D b}}$$

Or

$$v_w = 1.5\sqrt{\frac{LM_P}{A'_s\, h\, cos\emptyset_P + A_D b}}$$

where

v_w= maximum safe apparent wind speed (knots)
LMR = limiting restoring moment in roll (newton-metres)
LMP = limiting restoring moment in pitch (newton-metres)
A'_S = area of sails set including mast and boom (square metres)
h = height between the geometric centre of area of A's and the below-water profile of the hull, with centre/dagger boards lowered and the boat upright (metres)
$\emptyset_R$= heel angle at maximum roll righting moment (in conjunction with LMR)
$\emptyset_P$= limiting pitch angle used when calculating LMP (in conjunction with LMP)
A_D = plan area of the hulls and deck (square metres)
b = distance from centroid of A_D to the centreline of the leeward hull

11.8.4 Derivation of the maximum advised apparent windspeeds, and the BMA Yacht Stability Information Booklet, is to be submitted to the Survey Organisation for approval. Evidence shall be provided as to the derivation of the stability data.

11.8.5 The permitted area of operation shall be determined with reference to the following table, including the maximum safe apparent wind speed with no sails set (bare poles condition):

Permitted Area of Operation	Code Category	ISO 12217 Design Category	"Bare poles" safe wind should not exceed
Unrestricted	0	A	36 knots
Up to 150 miles from a safe haven	1	A	36 knots
Up to 60 miles from a safe haven	2	B	32 knots
Up to 20 miles from a safe haven	3	B	28 knots
Up to 20 miles from a safe haven in favourable weather and daylight	4	C	25 knots
Up to 20 miles from a nominated departure point in in favourable weather and daylight	5	C	25 knots
Up to 3 miles from a nominated departure point in favourable weather and daylight	6	C	25 knots

11.8.5 Trimarans operating in Areas 0 or 1 shall have sidehulls each having a total buoyant volume of at least 200% of the displacement volume in the fully loaded condition.

Trimarans operating in Area 2 shall have sidehulls each having a total buoyant volume of at least 150% of the displacement volume in the fully loaded condition.

11.9 Approval of Intact and Damage Stability

11.9.1 A vessel not required to have an approved BMA Yacht Stability Information Booklet.

11.9.1.1 A vessel for which stability is assessed on the basis of practical tests or simplified methods, defined in Section 11 of the Code, conducted by a competent person(s), shall be approved by the Survey Organisation. In order to give approval, the Survey Organisation shall 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.

11.9.1.2 The Survey Organisation shall file the details in the records retained for the vessel, and these details are to be entered on the certificate. See section 11.1.1.12 for requirements for the carriage of a BMA Yacht Stability Information Booklet.

11.9.2 A vessel required to have an approved BMA Yacht Stability Information Booklet.

11.9.2.1 The owner(s) shall 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.

11.9.2.2 A person competent to the satisfaction of the Survey Organisation shall witness the inclining test of a vessel and be satisfied as to conditions and the manner in which the test is conducted.

11.9.2.3 The owner(s) of a vessel shall be responsible for the submission of the BMA Yacht Stability Information 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 11 for the standard required for the vessel. The owner(s) shall submit three (3) copies of the booklet to the Survey Organisation for approval.

11.9.2.4 When satisfied with the form and content of the BMA Yacht 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 skipper but excluding accuracy of hull form data), the Survey Organisation shall stamp the booklet with an official stamp which contains the name of the Survey Organisation, the date of approval, a file (or record) reference, number of pages in the booklet and “APPROVED FORM AND CONTENT”.

11.9.2.5 Two (2) copies of the approved booklet shall be returned to the owner(s). The owners shall 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 skipper. The second booklet is for the

record of the owner(s). The Survey Organisation shall retain the third copy of the approved booklet in the records kept for the vessel.

11.9.3 *A vessel required to have approved damage stability information*

11.9.3.1 The owner(s) of a vessel shall 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 11.2. The owner(s) shall submit two (2) copies of the calculations to the Survey Organisation for approval.

11.9.3.2 The Survey Organisation shall approve the results of the damage stability cases provided that the results meet the standard defined in Section 11.2.

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

11.9.4 *Guidance on stability assessment*

11.9.4.1 It shall be noted that the Survey Organisation 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, for example, a mast-furled main sail, a roller-reefing headsail, a radar antenna or any other 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.

11.10 Vessel Fitted with a Deck Crane or other Lifting Devices

11.10.1 For the purposes of Section 11 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 Survey Organisation not to have a detrimental effect on the stability of the vessel.

11.10.2 Reference should be made to Section 32.2 for requirements for safety standards other than stability for a vessel fitted with a deck crane or other lifting device.

11.10.3 A vessel fitted with a deck crane or other lifting device shall be a decked vessel, as per Section 4.1.1 and 4.3.1.1, and comply with the general requirements of Section 11, which are appropriate to it.

11.10.4 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.

.1 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 degrees 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).

.2 When an angle of heel greater than 7 degrees but not exceeding 10 degrees occurs, the Survey Organisation 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:

i. 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 degrees;

ii. the area under the curve of residual righting lever, up to 40 degrees from the angle of static equilibrium or the downflooding angle, if this is less than 40 degrees, is equal to or greater than 0.1 metre-radians; and

iii. the minimum freeboard to deck edge fore and aft throughout the lifting operations should not be less than half the assigned freeboard to deck edge at amidships. For vessels with less than 1000mm assigned freeboard to deck edge amidships the freeboard fore or aft should not be less than 500mm.

iv. The freeboard to deck edge anywhere on the periphery of the vessel is at least 250mm.

11.10.5 Information and instructions to the skipper on vessel safety when using a deck crane or other lifting device should be included in the BMA Yacht Stability Information Booklet. The information and instructions should include:

.1 the maximum permitted load and outreach which satisfy the requirements of Section11.10.2, 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);

.2 details of all openings leading below deck which should be secured weathertight; and

.3 the need for all personnel to be above deck before lifting operations commence.

11.10.6 Requirements for a lifting system which incorporates counterbalance weight(s) or vessels that cannot comply with the requirements of Section 11.10.2 but is deemed to have adequate residual stability should be specially considered by the BMA.

11.11 Use of ISO "First of Type" Righting Moment Curve for Stability Assessment

11.11.1 General

11.11.1.1 Where the stability of a vessel is assessed using the righting moment curve prepared to show compliance of the design with ISO 12217, this curve shall be subject to verification and, if necessary, correction, as set out below.

11.11.1.2 ISO 12217 normally requires the stability to be assessed in the minimum operating condition. However, where the loaded displacement mass is more than 15% greater than the former, the stability also has to be assessed in this heavier condition.

11.11.1.3 Where data is available for both conditions, the heavier shall be used for the purposes of this Code.

11.11.2 Stability Verification Test

11.11.2.1 The vessel shall be subjected to the stability verification test when as close as practicable to the loading condition used for the righting moment curve to be checked, as defined in ISO 12217. The purpose of the test is to verify that the stability of the vessel is adequately described by the righting moment curve of the "First of Type" used for ISO 12217 assessment. Where this is not adequately demonstrated, this curve shall be corrected as described below before reassessment of the stability compliance.

11.11.2.2 The test shall be conducted in calm conditions. The vessel shall be heeled to both port and starboard as much as practicable by the application of a heeling moment sufficient to produce a heel angle of firstly at least three degrees in either direction, and secondly at least five degrees, i.e.: two heeling moments and four heel angles in all. The heeling moments and angles of heel shall be recorded as precisely as practicable.

11.11.2.3 The heeling moments shall be applied using weights that are part of the loaded condition of the vessel and moved through a known amount. The righting lever deduced for that angle of heel is given by:

$$GZ = \frac{\omega * h * cos\varphi}{\Delta}$$

where:

GZ = righting lever (m)

ω = mass moved to produce the heel angle (kg)

h = distance parallel to design waterline mass was moved through to produce heeling moment (m)

φ = angle of heel produced (degrees)

Δ = displacement of vessel as used to derive the GZ curve in question (kg)

11.11.2.4 Where the weights used to create the heeling moment have to be moved vertically from their normal location in order to generate the necessary heeling moment, the resulting measured righting moment shall be corrected for the change in the vertical centre-of-gravity of the craft. The correction = $GG_1 sin\varphi$, added to the measured GZ when the weights were raised during the heeling test, where GG1is the shift in vessel VCG due to the weights moved.

11.11.2.5 The First of Type righting moment curve shall be considered acceptable for stability assessment if the average deviation of the four values obtained at 11.11.2.3 and corrected according to 11.11.2.4 below the righting moment curve is equal to or less than 5%. Where the deviation is above the curve, no limit shall apply.

11.11.2.6 Where the average deviation of the four values obtained at 11.11.2.3 above from the righting moment curve is more than 5%, the First of Type righting moment curve shall be corrected throughout the range of heel angles by an amount equal to $GG_1 \sin\varphi$, where φ is any heel angle. The value of GG_1 used for this correction shall be obtained as follows:

$GG1 = \{ (\delta_1/\sin\varphi_1) + (\delta_2/\sin\varphi_2) + (\delta_3/\sin\varphi_3) + (\delta_4/\sin\varphi_4) \} / 4$
where:
δ_n= difference in measured GZ from First of Type GZ curve at angle φ_n, for the four values obtained according to 11.11.2.2 and calculated according to 11.11.2.3 and 11.11.2.4.

11.11.2.7 Where the righting moment curve is modified in this way, the stability shall then be reassessed using the requirements of chapter 11 of the Code.

11.11.3 Maximum Steady Heel Angle for Sailing Vessels

11.11.3.1 The maximum steady heel Angle to prevent downflooding in gusts is normally calculated for the loaded departure condition and may be increased if calculated for a lesser loading condition, such as the minimum operating condition used for many ISO 12217 stability calculations.

11.11.3.2 Where the stability of a sailing vessel is assessed using ISO 12217 in the minimum operating condition, the maximum steady heel angle calculated using this lesser loading condition must therefore be reduced by 10% to allow for this effect, before insertion in the BMA Yacht Stability Information Booklet.

12 FREEBOARD & FREEBOARD MARKING

12.1 Sailing Vessels

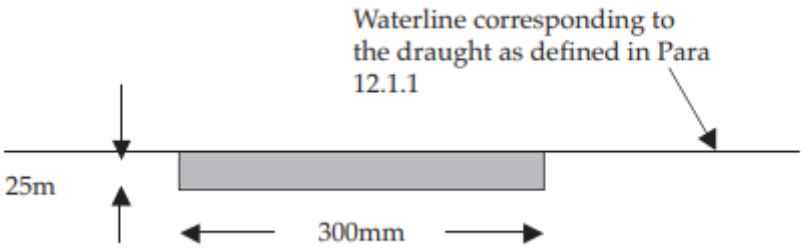
12.1.1 General

12.1.1.1 A sailing vessel required to be provided with an approved BMA Yacht Stability Information Booklet, other than a vessel assessed in conjunction with Section 11.6.4, shall have a freeboard mark placed on each side of the hull at the longitudinal position of the longitudinal centre of flotation for the maximum draught at which the stability of the vessel has been determined. In no case shall this draught be greater than the draught corresponding to the maximum displacement for which the scantlings have been approved.

12.1.2 Freeboard mark and loading

12.1.2.1 The freeboard mark referred to above shall measure 300mm in length and 25mm in depth.

12.1.2.2 The marking shall be permanent and painted black on a light background or in white or yellow on a dark background. The top of the mark shall be positioned at the waterline corresponding to the draught given in Section 12.1.1, at the position of the longitudinal centre of flotation, as shown in the sketch below:



12.1.2.3 A vessel shall not operate in any condition which will result in its freeboard marks being totally submerged when it is at rest and upright in calm sea water.

12.1.2.4 Sailing vessels with variable ballast are to be specially considered by the BMA.

12.2 Motor Vessels

12.2.1 General

12.2.1.1 Section 12.2.2 defines the requirements for minimum freeboard for a motor vessel whose stability has not been assessed using ISO 12217 - Part 1. Section 12.2.3 defines how and when the freeboard mark, and deck line, shall be applied. Requirements for an inflatable boat or boat fitted with a buoyant collar, not requiring an approved BMA Yacht Stability Information Booklet, are contained within Section 12.2.4.

12.2.1.2 It shall be noted that for vessels whose freeboard is not determined using Section 12.2.2.2, and are not provided with an approved BMA Yacht stability information booklet,

although requirements exist for minimum freeboard, such vessels are not required to be marked with a freeboard mark. In such cases the loading of the vessel is governed by the maximum permissible weight, in accordance with Section 11, as identified on the vessel's certificate.

12.2.2 *Minimum freeboard*

12.2.2.1 The freeboard, for a motor vessel whose stability has not been assessed in conjunction with Sections 11.3.8 or 11.4.5, shall be not less than that determined by the following requirements:

12.2.2.2 A vessel, other than an inflatable or rigid inflatable boat covered by Section 12.2.4, when fully loaded with deadweight items certificated to be carried (each person taken as 75kg) shall be upright and:

.1 in the case of a vessel with a continuous watertight weather deck in accordance with Section 4.3.1.1, 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 500 mm for vessels of 12 metres in length or over and not less than 750 mm for vessels of 18 metres in length or over. For a vessel of intermediate length, the freeboard shall be determined by linear interpolation;

.2 in the case of a vessel with a continuous watertight weather deck in accordance with Section 4.3.1.2, which may be stepped, recessed, or raised, have a freeboard measured down from the lowest point of the weather deck, of not less than 300 mm for vessels of 12 metres in length or over and not less than 400 mm for vessels of 18 metres in length or over. For a vessel of intermediate length, the freeboard shall be determined by linear interpolation. The raised portion(s) of the watertight weather deck shall extend across the full breadth of the vessel and the average freeboard over the length of the vessel shall comply with .1 above for a vessel with a continuous watertight weather deck;

.3 in the case of an open boat, have a clear height of side (i.e. the distance between the waterline and the lowest point of the gunwale[12]) of not less than 580mm for vessels of 12 metres in length or over and not less than 800mm for vessels of 18 metres in length or over. For a vessel of intermediate length, the clear height shall be determined by linear interpolation;

12.2.2.3 Alternatively, for vessels that cannot comply with section 12.2.2.2, freeboard may be assigned in accordance with the Merchant Shipping (Load Lines) Regulations 2000. Such vessels shall have a scale of draught marks marked clearly at the bow and stern.

[12] The clear height of the side shall 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

12.2.2.4 A vessel required to be provided with an approved BMA Yacht Stability Information Booklet shall be assigned a freeboard which corresponds to the draught of the vessel in sea water when fully loaded (each person taken as 75kg), but which in no case shall be less than the freeboard required by Section 12.2.2.1 or 12.2.2.2, nor that corresponding to the scantling draught.

12.2.3 Freeboard mark and loading

12.2.3.1 A vessel assigned a freeboard in accordance with Section 12.2.2.3 shall be marked with a freeboard mark in accordance with the Merchant Shipping (Load Lines) Regulations 2000 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, shall be recorded in the BMA Yacht Stability Information Booklet, where provided.

.1 Where it is considered that the addition of a scale of draught marks is neither practicable or meaningful, for example, due to restricted loading variations, application for special consideration shall be made to the BMA.

.2 Additionally, where the line of the deck is not immediately discernible, the vessel shall be provided with a deck line. The deck line and freeboard mark shall be permanent and painted on a contrasting background.

.3 The freeboard mark shall consist of a ring 300 millimetres in outside diameter and 25 millimetres wide, intersected by a horizontal line 450 millimetres long and 25 millimetres wide the upper edge of which passes through the centre of the ring. The top of the intersecting line shall be positioned at the waterline corresponding to the assigned freeboard to deck edge at amidships.

.4 No mark shall be applied for fresh water allowance.

.5 The assigning letter marking on the bar of the ring and bar shall be:

a. **B** on the left and **M** on the right when the BMA is the Survey Organisation; or

b. **B** on the left and **S** on the right when a Yacht Survey Organisation is the Survey Organisation; or

c. The assigning letter of the Recognised Organisation when a Recognised Organisation is the Survey Organisation.

12.2.3.2 The freeboard mark for a vessel required to be provided with an approved BMA Yacht Stability Information Booklet, other than a vessel complying with Section 12.2.3.1 shall be a bar of 300mm in length and 25mm in depth.

.1 The marking shall be permanent and painted black on a light background or in white or yellow on a dark background. (No assigning letter marking shall be placed on the bar marking.)

.2 The top of the mark shall be positioned at the waterline corresponding to the draught referred to in Section 12.2.2.4, at amidships.

.3 Additionally, where the line of the deck is not immediately discernible, the vessel shall be provided with a deck line. The deck-line shall be marked amidships on each side of the ship so as to indicate the position of the freeboard deck. The mark need not be of contrasting colour to the surrounding hull.

.4 Where the design of the vessel, or other circumstances, render it impracticable to mark the deck line, the Survey Organisation may direct that it be marked by reference to another fixed point as near as practicable to the position described above.

12.2.3.3 A vessel shall 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.

12.2.4 *Inflatable boats and boats fitted with a buoyant collar*

12.2.4.1 The freeboard of an inflatable boat or boat fitted with a buoyant collar shall 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 (e.g. diving equipment) and the number of persons for which it is to be certificated onboard, with the boat re-trimmed as necessary to represent a normal operating condition, and with the drainage socks (if fitted) tied up.

12.2.4.2 A freeboard mark is not required. The minimum freeboards recorded during the tests of Section 12.2.4.1 and the permissible maximum weight which can be carried shall be recorded on the certificate for the vessel.

12.2.4.3 For boats operating in Area Category 6 only, which do not meet the freeboard requirement of Section 12.2.4.1 at the transom, may still be accepted by the Survey Organisation provided it can be demonstrated that the boat is self-draining when moving ahead, and has a substantial reserve of buoyancy.

13 LIFE-SAVING APPLIANCES

13.1 General Requirements

13.1.1 All life-saving equipment must be marked in accordance with the LSA Code.

13.1.2 Retro-reflective material shall meet the minimum technical specification provided in Annex 2 of IMO Resolution A.658(16) *Recommendation on the Use and Fitting of Retro-Reflective Material on Life-Saving Appliances*.

13.1.3 The minimum required life-saving equipment is indicated in Table 13.1.

13.2 Liferafts

13.2.1 *Vessels Operating in Area Category 0*

13.2.1.1 Vessels shall 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.

13.2.1.2 The liferafts provided shall be constructed to SOLAS standard, have insulated floor and canopy and be equipped with a "SOLAS A pack".

13.2.1.3 The liferafts shall, in general, 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 shall be fitted with float free arrangements (hydrostatic release units) so that the liferafts float free and inflate automatically.

13.2.1.4 Stowage and release mechanisms other than 13.2.1.3 above will be considered when they can be demonstrated, to the satisfaction of the BMA, to give an equivalent level of safety.

13.2.2 *Vessels Operating in Area Category 1*

13.2.2.1 The liferaft requirements are as Section 13.2.1 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[13]. The certification shall clearly show this limitation.

13.2.2.2 Where the vessel is certificated to carry less than 16 persons, the liferaft requirement may be satisfied by a single liferaft. The liferaft capacity shall accommodate at least the total number of persons on board.

13.2.2.3 Existing vessels using ORC liferafts (ISAF OSR Appendix A Part 1), manufactured before the date of this Code coming into force are not required to upgrade that equipment until the end of its serviceable life. This is also applicable to vessels where the liferaft is

[13] Sea temperature data may be found in sources such as the Admiralty Pilot for a given sea area and period.

supplied on a hired basis. Such liferafts are to be serviced annually at a service station approved by the manufacturer.

13.2.3 *Vessels Operating in Area Category 2,3,4,5 & 6*

13.2.3.1 Vessels shall be provided with liferaft capacity to accommodate at least the total number of persons on board.

13.2.3.2 The liferaft(s) provided shall be either:

.1 in accordance with Section 13.2.1.2, except that the liferaft(s) shall be equipped with "SOLAS B PACK" or

.2 built to the International Sailing Federation (ISAF), Offshore Special Regulations (OSR) Appendix A Part 2 requirements. Liferaft(s) shall be equipped to a level equivalent to that of a "SOLAS B PACK". This may, where necessary, include a "grab bag" to supplement the equipment integral to the liferaft.

13.2.3.3 Liferafts carried in vessels which operate in Categories 2 and 3, where the sea temperature is less than 10°C[14], shall have an insulated floor and insulated canopy.

13.2.3.4 Liferafts shall be carried either:

.1 in approved FRP containers stowed on the weather deck or in an open space, and fitted with float free arrangements so that the liferafts float free and inflate automatically; or

.2 in FRP containers or valise stowed in readily accessible and dedicated weathertight lockers opening directly to the weather deck.

13.2.3.5 Existing vessels using ORC liferafts (ISAF OSR Appendix A Part 1) manufactured before the date of this Code coming into force are not required to upgrade that equipment until the end of its serviceable life. This is also applicable to vessels where the liferaft is supplied on a hired basis. Such liferafts are to be serviced annually at a service station approved by the manufacturer.

13.2.3.6 Vessels operating in Category 6 only, may utilise open reversible liferafts, constructed to SOLAS standards. Liferaft(s) shall be equipped to a level equivalent to a "SOLAS B pack" plus one topping-up pump or bellows. This may, where necessary, include a "grab bag" to supplement the equipment integral to the liferaft.

13.2.4 All liferafts, other than those covered in 13.2.2.3 or 13.2.3.5, shall be serviced at a service station approved by the manufacturer and at the manufacturers recommended intervals, however, where the liferaft(s) are stored in valises this shall be at least annually.

[14] See Footnote 5

13.2.5 Inflatable liferaft hydrostatic release units (other than the types which have a date limited life and are test fired prior to disposal) shall be serviced annually at a service station approved by the manufacturer.

13.2.6 Liferafts provided on sailing multihull vessels shall be located so that they are accessible when the vessel is either upright or after an inversion.

13.2.7 To facilitate rapid abandonment in an emergency where a 'grab bag' is provided it shall be in an accessible position known to all on board.

13.3 Lifebuoys

13.3.1 Lifebuoys shall be marked with the vessel's name and Port of Registry (NASSAU).

13.3.2 Vessels certified to operate in Categories 4, 5 & 6 need not carry lifebuoys fitted with lights.

13.3.3 Buoyant lines, where fitted, shall not be less than 18 metres in length.

13.3.4 Where light-weight lifebuoys (e.g. horseshoe type) are used, if not fitted with a buoyant line, they shall be fitted with a drogue (the drogue is required to prevent the lifebuoy being blown across the sea surface at high speed).

13.3.5 For sailing vessels, the Dan-buoy shall be attached to one of the lifebuoys and where applicable, a light.

13.4 Lifejackets

13.4.1 Lifejackets shall comply with the LSA Code or shall comply with ISO12402-3 or ISO12402-2 or equivalent standard acceptable to the BMA.

13.4.2 All lifejackets shall be fitted with a whistle, retro-reflective materials and, if operating in Categories 0, 1, 2 or 3, a light.

13.4.3 If the lifejackets are the inflatable type, an additional 10% or 2, whichever is the greater, shall be provided.

13.4.4 Inflatable lifejackets for new vessels and new inflatable lifejackets for existing vessels are to be of the compressed gas inflation type, with either manual or automatic inflation, and fitted with oral top up valves. On existing vessels, where orally inflated lifejackets (no compressed gas inflation) are carried, these are to be inflated at all times when worn on deck, and shall be replaced with compressed gas inflatable lifejackets, fitted with oral top up valves, at the end of their service life.

13.4.5 Compressed gas inflatable lifejackets shall be serviced within one month either side of the Compliance, Renewal and Intermediate examination. In the intervening years they are to

be examined annually to the manufacturer's recommendation. Certification/declaration of servicing must be available for inspection by the Survey Organisation/BMA. As far as reasonable and practicable, visual examinations shall be carried out weekly by the owner/managing agent to determine whether the lifejackets remain safe to use.

13.4.7 A suitable lifejacket shall be provided for each person on board under 32 kilogrammes.

13.4.8 It is strongly recommended that no more than two different types of lifejacket are permitted on any vessel, to limit any confusion in use.

13.5 Thermal Protective Aids (TPAs)

13.5.1 TPAs may be stowed in the 'grab bag'.

13.5.2 When immersion suits are provided for all onboard as part of the vessel's equipment, only 2 TPAs need to be provided for the use of injured persons.

.1 Immersion suits may be of the non-insulated type.

.2 Immersion suits are to be compatible with the lifejackets provided.

.3 Immersion suits may be provided to satisfy the personal clothing requirements of Section 22.8.

13.5.3 Vessels operating outside "warm climates" between latitudes 30° N and 30° S, using open reversible liferaft(s) in accordance with Section 13.2.3.6, shall carry TPAs for all persons on board. Vessels operating in "warm climates" or those fitted with a canopied liferaft need not carry any TPAs.

13.6 Portable VHF

13.6.1 Please refer to Table 16.1 in Section 16.

13.7 EPIRB

13.7.1 The EPIRB shall be installed in an easily accessible position ready to be manually released, capable of being placed in a liferaft, and capable of floating free and automatic activation if the vessel sinks.

13.7.2 Where compliance with Section 13.7.1 is not practicable and the vessel carries less than 16 persons, the EPIRB may be stowed in an accessible place and be capable of being placed readily in a liferaft without being capable of floating free.

13.7.3 All EPIRBS shall be maintained in accordance with the manufacturer's recommendations. Batteries shall be replaced as required by a manufacturer approved service station.

13.7.4 **All EPIRBs MUST BE REGISTERED with the BMA.**

13.8 SART

13.8.1 A SART (Category 0 and 1) is not required if the EPIRB provided has a 121.5 MHz frequency transmitting capability and is of the non-float free type for placing in a liferaft.

13.9 General/Fire Alarm

13.9.1 The General/Fire Alarm may be a bell or Klaxon or consist of the vessel's whistle or siren providing it can be heard in all parts of the vessel.

13.10 Pyrotechnics

13.10.1 Parachute flares, red hand flares, smoke signals, and other pyrotechnics shall comply with the LSA Code or equivalent standard acceptable to the BMA.

13.11 Training Manual

13.11.1 A training and instruction manual shall be carried by all vessels and shall contain:

.1 instructions and information on the lifesaving appliances provided in the vessel;

.2 information on the best methods of survival.

13.11.2 The training manual may take the form of instructions from the manufacturers of the life-saving equipment provided, as a minimum, with the following explained in detail:

.1 donning of lifejackets;

.2 boarding, launching, and clearing the survival craft from the vessel;

.3 illumination in launching areas;

.4 use of all survival equipment;

.5 use of all aids to location

.6 use of sea anchors;

.7 recovery of persons from the water;

.8 hazards of exposure and the need for warm clothing;

.9 best use of the survival craft facilities in order to survive;

.10 methods of retrieval, including the use of helicopter rescue gear (slings, baskets, stretchers), breeches-buoy and shore life-saving apparatus;

.11 instructions for emergency repair of the life-saving appliances;

.12 "Personal Survival at Sea" booklet, e.g. MCA Booklet MCA/075.

13.12 Instruction Manual (on board maintenance)

13.12.1 An instruction manual for on board maintenance shall be provided for all vessels.

13.12.2 The manual shall contain instructions for onboard maintenance of the life-saving appliances and shall include, as a minimum, the following where applicable:

.1 a check list for use when carrying out the required inspections;

.2 maintenance and repair instructions;

.3 schedule of periodic maintenance;

.4 list of replaceable parts;

.5 list of sources for spare parts;

.6 log of records of inspection.

13.12.2 The manual may be kept ashore by the owner/managing agent in the case of an open boat.

13.12.3 Vessels operating on bare-boat charter shall be provided with the manual whether an open boat or otherwise.

Area of Operation Category (nm=nautical miles)		0 unrestricted	1 ≥60nm & <150nm	2 ≥20nm & <60nm	3 <20nm	4 <20nm daylight & favourable weather	5 <20nm NDP daylight & favourable weather	6 <3nm NDP daylight & favourable weather
Liferafts (13.2)		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Total number of lifebuoys	<16 persons	2	2	2	2	2	2	2
	≥16 persons	4	4	4	4	4	4	4
Lifebuoy with Danbuoy (13.3)	<16 persons	N/A	N/A	N/A	N/A	Sail 1 Motor 0	Sail 1 Motor 0	Sail 1 Motor 0
	≥16 persons	N/A	N/A	N/A	N/A	Sail 1 Motor 0	Sail 1 Motor 0	Sail 1 Motor 0
Lifebuoy with Danbuoy and light (13.3)	<16 persons	Sail 1 Motor 0	Sail 1 Motor 0	Sail 1 Motor 0	Sail 1 Motor 0	N/A	N/A	N/A
	≥16 persons	Sail 1 Motor 0	Sail 1 Motor 0	Sail 1 Motor 0	Sail 1 Motor 0	N/A	N/A	N/A
Lifebuoy with light (13.3)	<16 persons	Sail 0 Motor 1	Sail 0 Motor 1	Sail 0 Motor 1	Sail 0 Motor 1	N/A	N/A	N/A
	≥16 persons	Sail 1 Motor 2	Sail 1 Motor 2	Sail 1 Motor 2	Sail 1 Motor 2	N/A	N/A	N/A
Lifebuoy with buoyant line (13.3)	<16 persons	1	1	1	1	1	1	1
	≥16 persons	1	1	1	1	1	1	1
Lifebuoys without attachments (13.3)	<16 persons	Sail 0 Motor 0	Sail 0 Motor 0	Sail 0 Motor 0	Sail 0 Motor 0	Sail 0 Motor 1	Sail 0 Motor 1	Sail 0 Motor 1
	≥16 persons	Sail 1 Motor 1	Sail 1 Motor 1	Sail 1 Motor 1	Sail 1 Motor 1	Sail 2 Motor 3	Sail 2 Motor 3	Sail 2 Motor 3
Additional buoyant line	<16 persons	0	0	0	0	0	0	0
	≥16 persons	1	1	1	1	1	1	1
Lifejackets (13.4)		100%	100%	100%	100%	100%	100%	100%
Parachute flares		12	6	4	4	0	0	0
Red hand flares		6	6	6	6	2	2	2
Smoke signals		2 buoyant	2 buoyant	2 buoyant or hand held	2 buoyant or hand held	2 buoyant or hand held	2 buoyant or hand held	2 buoyant or hand held
TPAs (13.5)		100%	100%	100%	100%	100%	100%	See 13.5.3
Portable VHF		Required for all vessels – see section 16						
EPIRB (13.7)		1	1	None	None	None	None	None
SART (13.8)		1	1	None	None	None	None	None
General alarm ≥16 persons		Yes	Yes	Yes	None	None	None	None
General alarm >750kW installed power		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lifesaving signals table 2 x SOLAS No.2 or 1 x SOLAS No.1		Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 13.1 – Lifesaving Appliances

14 STRUCTURAL FIRE PROTECTION & FIRE SAFETY

14.1 General

14.1.1 The boundary of the engine space shall, with special consideration given to fire flaps, be arranged to contain the fire extinguishing medium i.e. the engine space shall be capable of being closed down in order that the fire extinguishing medium cannot escape. Any fans located within or feeding a machinery space shall be capable of being stopped from outside the space in the event of a fire. Systems compromising automatic stopping of fans in the event of a fire shall be supplemented with a manual override.

14.1.2 Where it is not practical to have a machinery space, the engine shall be enclosed in a box. The box shall perform the same function as the machinery space boundaries in Section 14.1.1 above.

14.1.3 Combustible materials and liquids shall not be stowed in the engine space. If non-combustible materials are stowed in the engine space, they shall be adequately secured against falling on machinery and cause no obstruction to access to or from the space.

14.1.4 Small lockers on open deck for the stowage of hand portable containers of petrol shall be located away from high risk areas, have no electrical fittings, and be provided with the following:

.1 Natural ventilation openings top and bottom;
.2 Drainage leading overboard;
.3 Means of securing the fuel containers; and
.4 A facility to boundary cool the locker.

14.1.5 Portlights or windows shall 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) shall be used in an observation port.

14.2 Vessels Operating in Category 0 and 1 and in any other Category where the Total Installed Power Exceeds 750 kW or in any Category Carrying 16 or More Persons.

14.2.1 *Steel Construction*

14.2.1.1 Vessels which have the machinery space boundaries constructed of steel, require no additional fire protection. However, surfaces on the opposite side of the machinery space shall only be coated with finishes which have a Class 1 surface spread of flame rating when tested in accordance with FTP Code.

14.2.2 *Fibre Reinforced Plastic (FRP) Construction*

14.2.2.1 Machinery space boundaries shall prevent the passage of smoke and flame for 15 minutes, when tested in accordance with the procedure described in Yacht Notice 10.

14.2.2.2 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.

14.2.2.3 Intumescent polyester, epoxy, vinyl ester or phenolic resin surface coatings may also be used; however, solvent borne intumescent paints are not acceptable.

14.2.2.4 The Survey Organisation may waive the requirement for the test described in Yacht Notice 10 if the construction complies with an ISO or equivalent standard to give at least the same level of protection.

14.2.3 *Aluminium and Wood Construction*

14.2.3.1 Machinery space boundaries shall have an equivalent level of fire protection when compared to FRP construction.

14.2.4 Where insulation is fitted to provide an equivalent level of fire protection to that required in Section 14.2.2 or 14.2.3 the insulation need not be fitted lower than 300 mm below the waterline. (It shall 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.)

14.3 Insulation

14.3.1 Thermal or acoustic insulation fitted inside the engine space shall be of non-combustible material when tested in accordance with Yacht Notice 10.

14.3.2 Insulation shall be protected against impregnation by flammable vapours and liquids. Where insulation is cut, the edges shall be protected against such impregnation, e.g. by the use of non-combustible tape. Where the insulation is vulnerable to damage it shall be protected.

14.4 Cleanliness (and Pollution Prevention)

14.4.1 Provision shall be made to retain any oil leakage within the confines of the engine space.

14.4.2 In a vessel constructed of wood, measures shall be taken to prevent absorption of oil into the structure.

14.4.3 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 shall be made for the clearing of spillage and drainage collected in the engine space.

14.4.4 Efficient means shall be provided to ensure that all residues of persistent oils are collected and retained on-board for discharge to collection facilities ashore. Reference shall also be made to Section 21.

14.4.5 The engine space shall be kept clean and clear of oily waste and combustible materials.

14.4.6 Where petrol engines are installed, reference shall be made to Section 7.3.2.

14.5 Open Flame Gas Appliances

14.5.1 Open flame gas appliances provided for cooking, heating or any other purposes shall 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.

14.5.2 Installation of a gas appliance shall be in accordance with ISO 10239 or equivalent and Section 37.

14.5.3 Materials which are in the vicinity of open flame cooking or heating appliances shall 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 the FTP Code .

14.5.4 Combustible materials and other surfaces which do not have a surface spread of flame rating shall not be left unprotected within the following distances of a standard cooker:

.1 400mm vertically above the cooker, for horizontal surfaces, when the vessel is upright;

.2 125mm horizontally from the cooker, for vertical surfaces.

14.5.5 Curtains or any other suspended textile materials shall not be fitted within 600mm of any open flame cooking, heating or other appliance.

14.5.6 With regard to Section 14.5.4 and 14.5.5 above, ISO 9094 part 1 or part 2 will be taken as acceptable.

14.6 Furnishing Materials

14.6.1 It is recommended that Combustion Modified High Resilient (CMHR) foams are used in upholstered furniture and mattresses.

14.6.2 Upholstery covering fabrics shall satisfy the cigarette and butane flame tests of a recognised standard, see Yacht Notice 10.

14.7 Fire Detection

14.7.1 In vessels where the total installed power (propulsion and electrical generation) is greater than 750 kW efficient fire detectors shall be fitted in the engine space(s).

14.7.2 In a vessel carrying 16 or more persons, or operating in area category 0 or 1, efficient fire detectors shall be fitted in the engine space(s) and spaces containing open flame devices.

14.7.3 On any vessel, where an area is identified by the Survey Organisation as posing a fire risk to either passengers or crew (e.g. galleys, sleeping accommodation), fire detection equipment shall be installed to protect that area.

14.7.4 The fire detectors shall be appropriate to the hazard identified and shall give an audible warning that can be heard in the space concerned and in the control position when the vessel is in operation.

14.7.5 Efficient fire detectors may be required in order to comply with Section 14.8.3

14.8 Means of Escape

14.8.1 Two means of escape shall be provided in:

.1 accommodation spaces used for sleeping or rest; and

.2 other accommodation spaces affected by a fire risk; and

.3 machinery spaces affected by a fire risk except:

i) 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

ii) those spaces where any person entering and moving about the space is within 5 metres of the single entrance, at all times.

14.8.2 The means of escape shall 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, shall means of escape contrary to Section 14.8.1.1, .2 or .3 be accepted.

14.8.3 In the exceptional case where a single means of escape from accommodation spaces is accepted, efficient fire detectors shall be provided as necessary to give early warning of a fire emergency which could cut off that single means of escape.

14.8.4 Means of escape shall 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 Survey Organisation.

14.8.5 All sailing multihulls shall be fitted with an emergency escape hatch in each main inhabited watertight compartment to permit the exit of personnel in the event of an

inversion. Such escape hatches shall be located above both upright and inverted waterlines. See section 11.8 for inverted stability and buoyancy requirements.

15 FIRE APPLIANCES

15.1 General Requirements

15.1.1 A vessel shall be provided with efficient firefighting equipment in accordance within this Section. All equipment is to be serviced at the manufacturers recommended service intervals by a service station approved by the manufacturer.

15.2 Vessels Less than 15 metres in Length and Carrying 15 or Less Persons

15.2.1 One hand fire pump (outside engine space)[15] or one power driven fire pump (outside engine space)[10], with sea and hose connections, capable of delivering one jet of water to any part of the ship through hose and nozzle. One fire hose of adequate length with 10mm nozzle and suitable spray nozzle

OR

One multi-purpose fire extinguisher to the standard BS EN 3, with minimum fire rating of 13A/113B or smaller extinguishers giving the equivalent fire rating (in addition to that required below).

15.2.2 Not less than one multi-purpose fire extinguisher to the standard BS EN 3 with minimum fire rating of 5A/34B provided at each exit from accommodation spaces to the open deck. In no case shall there be less than two such extinguishers provided.

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

15.2.4 One fire blanket to the standard BS EN 1869 in galley or cooking area, where a fire risk can be identified.

15.3 Vessels 15 metres or More in Length or Carrying 16 or More Persons

15.3.1 One hand fire pump (outside engine space)[10] or one power driven fire pump (outside engine space)[10], with sea and hose connections, capable of delivering one jet of water to any part of the ship through hose and nozzle. One fire hose of adequate length with 10mm nozzle and suitable spray nozzle.

OR

Not less than two multi-purpose fire extinguishers to the standard BS EN 3 each with minimum fire rating of 13A/113B or smaller extinguishers giving the equivalent fire rating (in addition to that required below).

15.3.2 Not less than two multi-purpose fire extinguishers to a recognised standard, with a minimum fire rating of 13A/113B.

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[15] Either of these pumps may be one of the pumps required by Section 10 (Bilge Pumping), when fitted with a suitable change over arrangement which is readily accessible

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

15.3.4 One fire blanket to the standard BS EN 1869 in galley or cooking area, where a fire risk is identified.

15.4 Provision for Fire Extinguishing in Machinery Spaces

15.4.1 Fixed fire extinguishing in engine space, which may consist of a portable extinguisher suitably sized for the space being protected and arranged to discharge into that space, shall be provided for vessels fitted with inboard engines. An additional extinguisher, or one of the multi-purpose fire extinguishers required in 15.2 or 15.3, 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.

15.4.2 When a fixed fire extinguishing system (which is not a portable extinguisher) is installed in a machinery space, it shall be in compliance with the FSS Code

16 RADIO EQUIPMENT

16.1 General requirements

16.1.1 Radio equipment carried by a vessel shall be capable of fulfilling the following functional requirements with respect to distress and safety communications when the vessel is at sea:

16.1.1.1 Provide for the safety of the vessel by:

.1 transmitting ship-to-shore distress alerting;

.2 transmitting ship-to-ship distress alerting;

.3 transmitting and receiving on-scene communications, including appropriate search and rescue co-ordinating communications; and

.4 transmitting locating signals.

16.1.1.2 Assist other vessels in distress by:

.1 receiving shore-to-ship distress alerting; and

.2 receiving ship-to-ship distress alerting.

16.1.1.3 Receive navigational and meteorological warnings and urgent safety information (Maritime Safety Information).

16.1.2 Other than vessels operating in Category 6, all vessels shall have VHF DSC.

16.1.3 Where GMDSS equipment is installed, it shall be provided with automatic position updating information from the onboard navigational receiver, or procedures put in place to ensure positional information is manually updated at intervals not exceeding 4 hours.

16.2 Radio Installation

16.2.1 Table 16.1 lists the minimum and recommended radio equipment for the Code area of operation categories, which fulfil the functional requirements specified in Section 16.1.

16.2.2 VHF transmission and reception ranges are reliable only within the line of sight ranges, see Figure 16.1. VHF use shall be in compliance with IMO Assembly Resolution A.954(23) - Proper use of VHF channels at sea.

16.2.3 Aerials shall be mounted as high as is practicable to maximise performance. When the main aerial is fitted to a mast, which is equipped to carry sails, an emergency aerial shall be provided.

16.2.4 Skippers, owners and managing agents shall be aware of VHF coverage in the intended area of operation. Where the certainty of good VHF coverage is in doubt, skippers owners and managing agents shall seek advice from the Coastal State(s) on whether Medium Frequency (MF) or other equipment with long range transmission capability shall be carried (i.e. Recognised mobile satellite service Ship Earth Station, EPIRB etc).

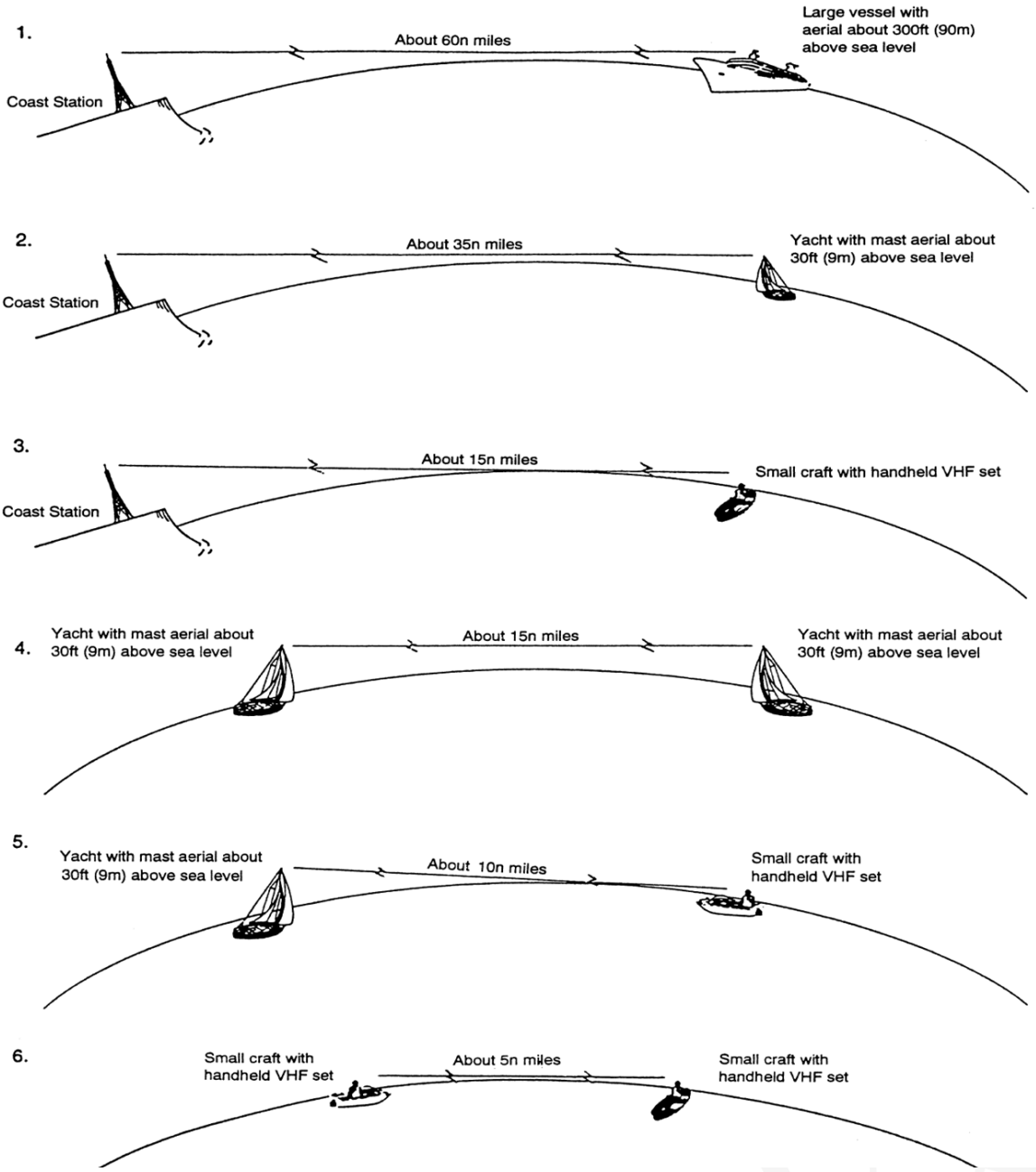

Figure 16.1 – Typical VHF range

16.2.5 When batteries are used for the electrical supply to radio equipment, the batteries, when fully charged, shall provide sufficient hours of operation to ensure effective use of the GMDSS installation bearing in mind the distance from shore that the vessel can operate. Appropriate charging facilities or a duplicate battery of capacity sufficient for the voyage shall be provided.

16.2.6 The battery electrical supply (reference shall be made to Section 8.4 or Section 34, if applicable) to the radio equipment shall be protected against flooding/swamping as far as

practicable and arranged so that radio communications are not interrupted in adverse conditions.

16.2.7 A fixed radio installation shall be clearly marked with the vessel's call sign, any other codes applicable to the use of the radio, and MMSI number where applicable. A card or cards giving a clear summary of the radio distress, urgency and safety procedures shall be displayed in full view of the radio operating position(s). Brief and clear operating instructions shall also be provided for the hand-held VHF (which is part of the vessels Life Saving Appliances) as required by Table 16.1.

Area of Operation Category (nm=nautical miles)	0	1	2	3,4&5	6
	Unlimited	Up to 150nm	Up to 60nm	Up to 20nm	Up to 3nm
VHF fixed installation*	1	1	1	1	R
Portable VHF[16]	1	1	1	1	1
MF SSB radio installation with DSC*	1#	1#	R#	None	None
Recognised mobile satellite service Ship Earth Station* (or MF/HF transceiver with DSC*)	R	R	None	None	None
NAVTEX receiver	1	1	R	R	None

Table 16.1 Minimum and Recommended Radio Equipment

R = Recommendation only
1 = Number required to be fitted
* An appropriate GMDSS certificate shall be carried by any person operating this equipment. The BMA can provide advice on suitable training courses.
# or a recognised mobile satellite service Ship Earth Station

[16] Portable VHFs shall be protected from water damage (e.g. waterproof cover). Where practicable, vessels carrying more than one liferaft are recommended to carry one portable VHF per raft.

17 NAVIGATION EQUIPMENT & NAVIGATION LIGHTS

17.1 Magnetic Compass

17.1.1 A vessel shall be fitted with an efficient magnetic compass, or other means of determining its heading, as well as means of correcting heading and bearings to true at all times (e.g. a valid deviation card for a magnetic compass):

.1 A properly adjusted standard magnetic compass or other means, independent of the vessel's main power supply, to determine the ship's heading and display the reading at the main steering position.

.2 In a steel vessel, it shall be possible to correct the compass for coefficients B, C and D and heeling error.

.3 The magnetic compass or a repeater shall be positioned so as to be clearly readable by the helmsman at the main steering position. For vessels operating in Categories 0, 1, 2, and 3, a compass light shall be fitted.

.4 Means shall be provided for taking bearings as nearly as practicable over an arc of the horizon of 360 degrees. (This requirement may be met by the fitting of a pelorus or, in a vessel other than a steel vessel, a hand bearing compass.)

17.2 Fluxgate Compass

17.2.1 Fluxgate compasses are acceptable under the Code, as an alternative to that required in 17.1, provided that a suitable back-up power supply is available to power the compass in the event of failure of the main electrical supply.

17.2.2 Where a Fluxgate 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.

17.3 Other Equipment

17.3.1 All vessels shall be fitted with an echo sounder, or other means, to measure the available depth of water.

17.3.2 A vessel which operates more than 20 miles from land (Area Category 0, 1 or 2) shall be provided with:

.1 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 at all times.

.2 A distance measuring log; except that this need not be provided where the navigational aid in Section 17.3.2.1 provides reliable distance measurements in the area of operation of the vessel.

17.4 Navigation lights

17.4.1 Every vessel shall comply with the requirements of COLREGs in accordance with the national legislation of The Bahamas.

17.4.2 If it can be demonstrated to the Survey Organisation that, for a particular vessel, full compliance with the Regulations is impracticable, then application shall be made to the BMA via the Survey Organisation for consideration of equivalent arrangements, taking into account the nature of the operation of the vessel concerned.

17.4.3 Table 17.4 is a summary table of navigation lights, shapes and sound signalling appliances for vessels. This Table is for guidance only and does not cover all possible operations, e.g. diving. Reference shall be made to the regulations stated in Section 17.4.1 for all operations not covered.

Overall length of vessel	Power vessels when underway (& sailing vessels when under power)	Sailing vessels when under sail	At anchor	Not under command	Aground	Sound appliances
12-20m	Masthead (vis 3 miles) + sidelights + stern light	Sidelights + stern light (sidelights may be combined) OR Combined lantern at masthead3 (tricolour)	Required	Required[d]	Required[d,e]	Whistle and bell required
20-24m	Masthead (vis 5 miles) + sidelights + stern light	Sidelights + stern light may show (in addition to other lights) two all-round lights near masthead, the upper red and the lower green	Required[d]	Required	Required	Whistle and bell required

Table 17.4 – Lights, shapes and sounds appliances (see Section 17.1.4)

Notes:

a. For sailing vessels, attention should be paid to light arrangements when under power i.e. steaming lights in place of masthead light. Size of the daytime shapes and distances apart may be reduced commensurate with size of vessel
b. By night, all round white light where best seen; by day one black ball (0.6 metres in diameter) in the fore part.
c. By night, two all round red lights in a vertical line 2 metres apart and the lowest not less than 4 metres above the hull (weatherdeck); by day two black balls (0.6 metres in diameters) in a vertical line, 1.5 metres apart.
d. Size of the daytime shapes and distances apart may be reduced commensurate with size of vessel
e. The distances for the lights may be reduced to one metre apart and 2 metres above the hull (weatherdeck)
f. By night two all round red lights in a vertical line 2 metres apart plus anchor light; by day three black balls (0.6 metres diameter) in a vertical line, 1.5 metres apart

17.2 Special requirements for lights using LEDs[17]

17.2.1 The luminous intensity of LEDs gradually decreases while the electricity consumption remains unchanged. The rate of decrease of luminous intensity depends on the output of LEDs and temperatures of LEDs. To prevent shortage of luminous intensity of LEDs:

.1 an alarm function should be activated to notify the Officer of the Watch when the luminous intensity of the light reduces below the level required by COLREGs; or

.2 LEDs shall only be used within the lifespan (practical term of validity) specified by the manufacturer to maintain the necessary luminous intensity of LEDs. The lifespan of LEDs shall be determined and clearly notified by the manufacturer based on the appropriate test results on the decrease of luminous intensity of the LEDs under various temperature conditions and on the temperature condition of LEDs in the light during operation, taking the appropriate margin into account.

[17] See IMO Resolution MSC.253(83) *Recommendation on Performance Standards for Navigation Lights*

18 MISCELLANEOUS EQUIPMENT

18.1 Nautical Publications

18.1.1 Charts and other nautical publications to plan and display the vessel's route for the intended voyage and to plot and monitor positions throughout the voyage shall be carried. The charts must be of such a scale and contain sufficient detail to show clearly all relevant navigational marks, known navigational hazards and, where appropriate, information concerning ship's routeing and ship reporting schemes. Nautical publications may be contained within a consolidated publication. However, vessels operating in Area Category 6 need not carry publications.

18.1.2 An electronic chart plotting system, complying with the requirements detailed in IMO resolution A.817(19) may be accepted as meeting the chart carriage requirements of this section.

18.2 Signalling Lamp

18.2.1 A vessel shall be provided with an efficient waterproof electric lamp suitable for signalling.

18.3 Radar Reflector

18.3.1 A vessel is to be provided with a radar reflector in compliance with IMO performance standard provided in Resolution MSC.192(79), or other means, to enable detection by ships navigating by radar.

18.3.2 For Category 6 vessels only, where it is not practicable for an efficient radar reflector to be fitted, they must not put to sea in fog, and if visibility starts to deteriorate, they are to return to shore immediately.

18.4 Measuring Instruments

18.4.1 A vessel operating in Area Category 0, 1, 2 or 3 shall carry a barometer.

18.4.2 A sailing monohull vessel operating in Area Category 0 or 1, or carrying 16 or more persons, shall be provided with an inclinometer.

18.4.3 A sailing monohull vessel operating in Area Category 0, 1, 2 and 3 shall be provided with an anemometer.

18.4.4 A sailing multihull vessel shall be provided with an anemometer providing a continuous indication of apparent windspeed, with the display clearly visible at each control position.

18.5 Searchlight

18.5.1 A vessel operating in Area Category 0, 1, 2 or 3 shall be provided with an efficient fixed and/or portable searchlight suitable for use in man-overboard search and recovery operations.

18.6 Sailing Vessels – Wire Cutting Equipment

18.6.1 A sailing vessel must carry appropriate wire cutting equipment, or equivalent means to clear rigging, for use in the event of dismasting.

19 ANCHORS AND CABLES

19.1 General

19.1.1 The requirements given in Table 19.1 are for a vessel of normal form which may be expected to ride-out storms whilst at anchor. The anchors and cables are not designed to hold a vessel off exposed coasts in rough weather nor stop a vessel that is moving.

19.1.2 Provision is to be made for the secure storage of the anchor and its cable.

19.2 Anchors

19.2.1 The Tabulated values for anchor masses refer to High Holding Power anchors. Anchors of other designs may be accepted based on the stated holding power.

19.2.2 When a fisherman type of anchor is provided, the mass given in Table 19.1 shall be increased by 75% but the diameter of the anchor cable need not be increased.

19.2.3 For vessels with an unusually high windage, due to high freeboard, a large rig, large deckhouses or superstructures, the mass of the anchor and the anchor cable diameter shall be increased above that required in Table 19.1 to correspond to the increased wind loading. The increase in anchor mass and corresponding cable strength is to be to the satisfaction of the Survey Organisation.

19.2.4 For vessels of unusual or non-conventional ship form the anchor and cable size shall be to the satisfaction of the Survey Organisation.

19.2.5 Anchors are to be rigged ready for use. Only where the particular operating patterns dictate may the anchor be left unready.

19.2.6 The design of the anchor is to be acceptable to the Survey Organisation.

19.2.7 Stainless steel and aluminium anchors will be separately considered dependent upon the test loads for which the anchor has been designed.

19.3 Cables

19.3.1 The length of anchor cable attached to an anchor shall be appropriate to the area of operation but generally shall be not less than 4 x the vessel length or 30 metres, whichever is the longer, for each of the main and kedge anchors.

19.3.2 The cable for main anchors and for kedge anchors may be of chain or rope.

19.3.3 When the anchor cable is of fibre rope or wire, there shall be not less than 10 metres or 20% of the minimum required cable length, whichever is the greater, of chain between the rope and the anchor. Where the anchor cable is wire then proposals to substitute the chain tail by

an anchor and/or chain of enhanced mass will be considered to the satisfaction of the Survey Organisation, with special attention paid to the anchor performance, i.e. catenary.

19.3.4 The strength, form and material of the anchor cable and its attachments to the anchor and the vessel shall be approved by the Survey Organisation.

19.3.5 Anchoring systems incorporating a windlass shall have the bitter end of the cable secured to the vessel's structure and capable of being released in an emergency.

19.3.6 Anchor steel wire rope is to be fitted with thimbles at both ends.

19.4 Operations

19.4.1 When an anchor mass is more than 30kg, an efficient mechanical means shall be provided for handling the anchor.

19.4.2 There shall be a strong securing point on the foredeck or equivalent structure and where appropriate a fairlead or roller at the stem head.

19.4.3 Area of Operation Category 0,1,2, or 3

19.4.3.1 A vessel shall be provided with at least two anchors (one main and one kedge or two main) and cables, subject to Section 19.1 and in accordance with the requirements of Table 19.1.

19.4.3.2 Anchors of equivalent holding power may be proposed and provided, subject to approval by the Survey Organisation.

19.4.4 Area of Operation Category 4 and 5

19.4.4.1 A vessel shall be provided with at least two anchors (one main and one kedge or two main), the masses of which may not be less than 90% of the requirements of Table 19.1, with corresponding cables and subject to approval by the Survey Organisation.

19.4.5 Area of Operation Category 6

19.4.5.1 An anchor of sufficient mass for the size and type of vessel must be provided, and as a minimum the mass shall correspond to that of a kedge, as illustrated in the Table 19.1.

Anchor Mass			Anchor Cable Diameter			
Vessel Length	Main	Kedge	Main Chain Rope	Kedge Chain	Rope (range)	
Metres	Kg	Kg	mm	mm	mm	mm
12	18	9	8	14	8	12
13	21	10	10	14	8	12
14	24	12	10	14	8	12
15	27	13	10	14	8	12
16	30	15	10	14	8	12
17	34	17	10	14	8	14
18	38	19	10	16	8	14
19	42	21	12	16	10	14
20	47	23	12	16	10	14
21	52	26	12	16	10	14
22	57	28	12	19	10	16
23	62	31	12	19	10	16
24	68	34	12	19	10	16

Table 19.1 – Anchors and cables

Notes:

1. Chain cable diameter given is for short link chain. Chain cable should be sized in accordance with EN 24 565 and BS 7160/ISO 4565, or equivalent.
2. The rope diameter given is for nylon construction. When rope of another construction is proposed, the breaking load should be not less than that of the nylon rope specified in the table.
3. When anchors and cables are manufactured to imperial sizes, the metric equivalent of the anchor mass and the cable diameter should not be less than the table value.

20 ACCOMMODATION

20.1 General

20.1.1 *Hand holds and grab-rails*

20.1.1.1 There shall be sufficient hand holds and grab-rails within the accommodation to allow safe movement when the vessel is in a seaway.

20.1.2 *Securing of heavy equipment*

20.1.2.1 Heavy items of equipment such as batteries, cooking appliances etc. shall be securely fastened in place to prevent movement due to severe motions of the vessel. In the case of a sailing vessel, the severe motions shall include motions leading to inversion.

20.1.2.2 Stowage lockers containing heavy items shall have lids or doors with secure fastenings.

20.1.3 *Access/escape arrangements*

20.1.3.1 Means of escape from accommodation spaces shall satisfy the requirements of Section 5.2.1.4.1, 5.4.1 and 14.8.

20.1.4 *Ventilation*

20.1.4.1 There shall be adequate ventilation in all accommodation spaces.

20.1.5 *Hot water systems*

20.1.5.1 Hot water supply systems (if any) shall be designed, installed and maintained for the pressure and temperature at which they are to operate.

20.2 Vessels at Sea for More than 24 Hours

20.2.1 When a vessel is intended to be at sea for more than 24 hours, an adequate standard of accommodation for all on board shall be provided. In considering such accommodation, primary concern shall be directed towards ensuring the health and safety aspects of persons, e.g. the ventilation, lighting, water services, galley services and the access/escape arrangements. In particular the following standards shall be observed:

20.2.2 *Ventilation*

20.2.2.1 Where air conditioning systems are not fitted, mechanical ventilation shall be provided to accommodation spaces which are situated completely below the level of the weather deck on vessels making long international voyages or operating in tropical waters, and which carry 9 or more berthed persons below deck. As far as practicable, such ventilation arrangements shall be designed to provide at least 6 changes of air per hour when the access openings to the spaces are closed.

20.2.3 *Lighting*

20.2.3.1 An electric lighting system shall be installed which is capable of supplying adequate light to all enclosed accommodation and working spaces.

20.2.4 *Water services*

20.2.4.1 An adequate supply of fresh drinking water shall be provided and piped to convenient positions throughout the accommodation spaces.

20.2.4.2 In addition, an emergency (dedicated reserve) supply of drinking water shall be carried at the rate of 2 litres per person on board.

20.2.5 *Sleeping accommodation*

20.2.5.1 A bunk or cot shall be provided for each person on board and at least 50% of those provided shall be fitted with lee boards or lee cloths.

20.2.6 *Galley*

20.2.6.1 A galley shall be fitted with a means for cooking and a sink and have adequate working surface for the preparation of food.

20.2.6.2 When a cooking appliance is gimballed it shall be protected by a crash bar or other means to prevent it being tilted when it is free to swing, and a strap, portable bar or other means shall be provided to allow the cook to be secured in position, with both hands free for working, when the vessel is rolling. A means shall be provided to lock the gimbal mechanism to prevent movement.

20.2.6.3 There shall be secure storage for food in the vicinity of the galley.

20.2.7 *Toilet facilities*

20.2.7.1 Adequate toilet facilities, separated from the rest of the accommodation, shall be provided for persons on board.

20.2.7.2 In general, there shall be at least one flushing marine toilet and one wash hand basin for every 12 persons.

20.2.7.3 Due consideration shall be given to the requirements of Section 21.

20.2.8 *Stowage facilities for personal effects*

20.2.8.1 Adequate stowage facilities for clothing and personal effects shall be provided for each person on board.

21 ENVIRONMENTAL PROTECTION

21.1 General Requirements

21.1.1 A vessel complying with the Code shall meet international, national, regional and local requirements for the prevention of marine pollution which are applicable to the area in which the vessel is operating.

21.1.2 It is the responsibility owner/managing agent to ensure that the vessel is properly equipped and maintained to meet the relevant requirements.

21.1.3 It is also the responsibility of the owner/managing agent to ensure that a charterer of a vessel receives up-to-date and adequate information on prevention of pollution in the area in which the charterer intends to operate. The information may include the need to seek advice from local or harbour authorities, for which contact points shall be given.

21.1.4 The disposal of ship generated waste to port reception facilities is usually regulated. Vessels shall ensure they manage their wastes in a sustainable manner and fulfil the applicable requirements of any regulations.

21.1.5 Yachts shall not pollute the sea with oil or oil based products, sewage or garbage.

21.2 Requirements for Preventing Pollution of the Sea (MARPOL)

21.2.1 *Annex I - Oil*

21.2.1.1 Small yachts are not required to be surveyed, certified or hold any statutory records under MARPOL Annex I.

21.2.1.2 However, yachts shall minimise marine oil pollution from machinery and shall limit the production of oil residues and oily mixtures and their discharge at sea.

21.2.1.3 Means to prevent pollution by oil shall be acceptable to the appropriate authorities in the area(s) in which the vessel operates.

21.2.2 *Annex III – Harmful Substances in Packaged Form*

21.2.2.1 Yachts shall not carry harmful substances in packaged form.

21.2.2.2 Harmful substances in packaged form in ship's stores, carried for use during the voyage, are permitted but shall be appropriately used and stowed.

21.2.2.3 Material Safety Data Sheets shall be available for all harmful substances carried on board and appropriate personal protective equipment shall be carried in sufficient quantities to safely handle those substances.

21.2.1 *Annex IV - Sewage*

21.2.1.1 Yachts carrying more than 15 persons shall be surveyed and provided with an International Sewage Pollution Prevention Certificate.

21.2.1.2 If the vessel is not fitted with an approved sewage treatment system, the provision of holding tanks of sufficient capacity to store wastewater for discharge to shore facilities may be needed for a vessel to comply.

21.2.1.3 There are two standard pump out connections: ISO 8099 which is a one and a half inch pipe thread (in accordance with ISO 221-1) and MARPOL which is a 16mm thick flange having four 18mm diameter holes on a 170mm pitch circle diameter.

21.2.1.4 If sewage holding tanks are fitted, they shall be constructed with a sloping bottom arranged such that the outlet is at the lowest point. Ventilation arrangements shall be routed well clear of accommodation and sleeping quarters. Outlets from ventilation shall not be near ventilation or machinery inlets and shall not pose a danger to other vessels alongside. Tanks shall be manufactured from material not susceptible to corrosion in anaerobic decomposition conditions.

21.2.2 *Annex V - Garbage*

21.2.2.1 The disposal of garbage into the sea is prohibited. All yachts shall comply with the provisions of MARPOL Annex V on discharge of garbage into the sea.

21.2.2.2 All yachts shall display placards which notify the crew and passengers of the discharge requirements of regulations 3, 4, 5 and 6 of MARPOL Annex V.

21.2.2.3 Yachts certified to carry 15 or more persons, **OR** of 100 gross tonnage and above, shall carry a Garbage Management Plan in accordance with Regulation 10 of MARPOL Annex V.

21.2.2.4 Yachts certified to carry 15 or more persons engaged on voyages outside The Bahamas shall maintain records in a Garbage Record Book Part I as described in Regulation 10 of MARPOL Annex V.

21.2.2.5 Arrangements for the retention of garbage on board and for discharge to shore facilities shall be provided. Arrangements shall be varied as necessary to comply with special requirements which may be applied by authorities in the area in which a vessel operates.

21.2.3 *Annex VI – Air Pollution*

21.2.3.1 Small yachts are not required to be surveyed, certified or hold any statutory records in compliance with MARPOL Annex VI.

21.2.3.2 However, small yachts shall minimise air pollution.

21.2.3.3 All diesel engines with an output of more than 130kW[18], installed on or after 01 January 2000, shall be certified in accordance with the NOx Technical Code and provided with an Engine International Air Pollution prevention (EIAPP) Certificate and an approved Technical File.

21.2.3.4 A marine diesel engine installed on a yacht is not required to comply with the Tier III NOx requirements specified in Regulation 13 of MARPOL Annex VI. However, compliance with Tier III requirements is strongly recommended for any yacht that is intended to change between "private" and "charter" status.

21.3 Antifouling Paints

21.3.1 The International Anti-Fouling System Convention (AFS Convention) applies to all vessel types operating in the marine environment, irrespective of tonnage, including every yacht.

21.3.2 Small yachts are not required to have an International Anti-fouling System Certificate, however, evidence that the type of anti-fouling coating used is compatible with the AFS Convention shall be carried onboard.

21.3.3 The AFS Convention prohibits the use of environmentally harmful organotin compounds (for example tributyltin) in antifouling paints and prevents the possible use in the future of other harmful substances in anti-fouling systems.

21.4 Ballast Water

21.4.1 The Ballast Water Management Convention[19] (BWM Convention) applies to all vessels designed or constructed to carry ballast water of any kind, whether sea water or fresh water. Please refer to BMA Information Bulletin No. 165.

21.4.2 The Convention allows for equivalent compliance for pleasure craft used solely for recreation or competition or craft used primarily for search and rescue less than 50 metres in overall length and with a maximum ballast water capacity of eight cubic metres. Overall length means the length of the hull excluding bowsprits, booms, bumpkins, pulpits, etc. Please refer to MEPC.123(53) *Guidelines for Ballast Water Management Equivalent Compliance (G3)*.

[18] Approximately 177 horsepower
[19] The International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004

22 PROTECTION OF PERSONNEL

22.1 Bulwarks, Guard Rails and Handrails (General)

22.1.1 Bulwarks, guardrails and guard wires shall be supported efficiently by stays or stanchions. When application of such measures would impede the proper working of the vessel, alternative safety measures shall be considered, for guidance ISO 15085 refers.

22.1.2 To protect persons from falling overboard bulwarks or three courses of rails or taut wires shall be provided and the bulwark top or top course shall be not less than 1000mm above the deck. The distance between the lowest course and the deck shall not exceed 230mm and the distance between other courses shall not exceed 380mm.

22.1.3 In a vessel fitted with a cockpit which opens aft to the sea, additional guardrails shall be fitted so that there is no unprotected vertical opening (i.e. between vertical 'members') greater than 500mm in width.

22.1.4 For vessels operating in Category 6, where it is impractical and unnecessary to fit guardrails, alternative arrangements may be acceptable subject to the Survey Organisation being satisfied as to the adequacy of the proposed arrangements. For example, on small motor vessels with narrow side decks alongside a deck house, a handrail on the side of the deckhouse may be fitted. On the foredeck, a centreline handrail may be considered more workable.

22.1.5 Handrails shall be provided for access stairways, ladderways, passageways and for decks without bulwarks or guardrails. This provision shall not be used in lieu of guardrails and bulwarks where required by the Code.

22.1.6 In an inflatable boat or a rigid inflatable boat, handgrips, toeholds and handrails shall be provided as necessary to ensure safety of all persons on board during transit and the worst weather conditions likely to be encountered in the intended area of operation.

22.2 Sailing Vessels

22.2.1 When the proper working of a sailing vessel may otherwise be impeded, bulwarks or two courses of rails or taut wires shall be fitted around the working deck and the height of the protection shall be not less than 600mm above the deck. Rails or wires shall be supported at intervals not exceeding 2.2 metres.

22.2.2 In a vessel fitted with a headstay, a fixed or drop-nosed bow pulpit shall be provided forward of the headstay of at least the same height as the guardrails, except in way of a substantial bowsprit. A drop-nosed pulpit with an opening wider than 250mm shall be provided with a means of closure at guardrail height, for use at sea.

22.2.3 When it is desired to move forward of a pulpit to access a bowsprit or to assist with docking operations, it shall be permissible to arrange the pulpit with an opening in its

forward-most part. In this case, an efficient means of closure of the opening shall be fitted, and jackstays provided in accordance with Section 22.3.8.

22.3 Safety Harnesses

22.3.1 A vessel shall be provided with safety harnesses as necessary for all persons who may be required to work on deck, with a minimum number of 2.

22.3.2 A sailing vessel shall carry a safety harness for each person on board.

22.3.3 Efficient means for securing the lifelines of safety harnesses shall be provided on exposed decks, and grabrails provided on the sides and ends of a deckhouse.

22.3.4 Fastening points for the attachment of safety harness lifelines shall be arranged having regard to the likely need for work on or above deck. In general, securing points shall be provided in the following positions:

.1 close to a companionway; and

.2 on both sides of a cockpit.

22.3.5 When guard rails or wires are not otherwise provided, or do not meet the requirements of Section 22.1 or 22.2, jackstays (which may be fixed or portable) secured to strong points, shall be provided on each side of the vessel to enable crew members to traverse the length of the weather deck in bad weather.

22.3.6 For sailing vessels operating in Area Category 0, 1, 2 or 3, jackstays must be provided.

22.3.7 Motor vessels with guardrails of a height less than that required by Section 22.1 may be accepted for areas where passengers are not normally allowed. These areas shall be restricted to crew use only and alternative arrangements provided onboard for their protection.

22.3.8 When a sailing vessel is provided with an open fronted pulpit, jackstays shall be carried sufficiently far forward to protect persons working in the vicinity of the pulpit.

22.4 Toe Rails

22.4.1 When appropriate to the working of a vessel provided with a sailing rig, a toe rail of not less than 25mm in height shall be fitted around the working deck.

22.5 Safe Location

22.5.1 In a non-decked vessel or rigid inflatable, it is the owner's/operator's responsibility to ensure that a safe location aboard the boat is provided for all persons.

22.6 Surface of Working Decks

22.6.1 The surface of a working deck shall be non-slip.

22.6.2 Acceptable surfaces are chequered plate, unpainted wood; a non-skid pattern moulded into FRP; non-slip deck paint; or an efficient non-slip covering.

22.6.3 Particular attention shall be paid to the surface finish of a hatch cover when it is fitted on a working deck and, for sailing vessels, to sloping coach roof sides where these effectively constitute a working deck when the vessel is heeled.

22.6.4 In an inflatable boat or rigid inflatable boat the upper surface of the inflatable buoyancy tube shall be provided with a non-slip finish.

22.7 Recovery of Persons from the Water

22.7.1 An overside boarding ladder or scrambling net which extends from the weather deck to at least 600mm below the operational waterline, or other means to aid the recovery of an unconscious person from the water, shall be provided to the satisfaction of the Survey Organisation.

22.8 Personal Clothing

22.8.1 It is the responsibility of an owner/managing agent/skipper to advise that the following requirements for items of personal clothing shall be met:

.1 Each person on board a vessel shall have protective clothing appropriate to the prevailing air and sea temperatures.

.2 When a vessel is operating in waters of sea surface temperature of 10°C or less, each person on board shall have either an approved immersion suit, a dry suit or other efficient garment to reduce the likelihood of hypothermia shall the wearer enter the sea. Sea temperature data may be found in sources such as the Admiralty Pilot for a given sea area and period.

.3 Each person on board a vessel shall have footwear having non-slip soles, to be worn on board.

22.9 Noise

22.9.1 Attention is drawn to the IMO Code on Noise Levels Onboard Ships (Noise Code).

22.9.1 Vessels covered by this Code shall meet the Noise Code so far as is reasonable and practicable.

22.9.2 The Noise Code application of recommended noise levels on small vessels shall be meant to be limited and to deal with the means of protecting the seafarer from the risk of noise-induced hearing loss under conditions where, at the present time, it is not technically feasible to limit the noise to a level which is not potentially harmful. Factors which are taken into account include voyages of short duration and vessels without sleeping accommodation which are crewed on a shift basis.

22.9.3 For safe navigation, it is important that sound signals and VHF communications can be heard, at the navigating position in normal operating conditions.

22.9.4 For machinery spaces, workshops and stores which are manned either continuously or for lengthy periods, the recommended limits are 90dB(A) for machinery spaces and 85dB(A) for workshops and stores.

22.9.5 For machinery spaces which are not intended to be continuously manned or are attended for short periods only, the recommended limits are 110dB(A).

22.9.6 To indicate the need to wear ear protectors to a recognised standard[20], a sign with symbol and supplementary warning notice shall be displayed at all entrances to enclosed spaces in which the noise level exceeds 85dB(A).

[20] Such as BS 5378 Safety signs and colours

23 SHIP-SHORE TRANSFER OF PERSONNEL

23.1 Tenders

23.1.1 When a vessel carries a rigid or inflatable tender, it shall be fit for its intended use, regularly inspected by the owner/managing agent, and maintained in a safe condition.

23.1.2 Safety equipment shall be provided in the tender as appropriate to its intended range and area of operation.

23.1.3 Each tender shall be clearly marked with the number of persons (mass 75 kilograms) that it can safely carry, and the name of the parent vessel.

23.1.4 In the case of petrol-engine tenders, operation shall be in accordance with the manufacturer's instructions with due consideration to the safety requirements for the carriage of petrol contained in each part of the Code.

23.1.5 All tenders, when fitted with remote throttle controls, shall be fitted with a kill cord, to be used at all times during navigation. A spare kill cord shall also be carried on board.

23.1.6 An inflatable tender is not required to meet the requirements for inflatable boats or rigid inflatable boats in Section 4.5.

23.1.7 It is strongly recommended that a sailing vessel shall carry (or tow) one or more rigid or inflatable tenders.

23.2 Gangways, Passerelles, and Accommodation Ladders

23.2.1 A safe means of access shall be provided at all times when in port, either deployed or available for deployment. If the safe means of access is not deployed, there shall be a means provided for communication between those on the quay and those onboard and in all circumstances a safe means of access shall be provided for any persons embarking or disembarking on the ship.

23.2.2 Access equipment and immediate approaches to it shall be adequately illuminated.

23.2.3 Equipment used to provide access shall also meet the standards in ISO 7061 and ISO 5488 or the requirements set out in MSC.1/Circ.1331, *Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation* and applicable national legislation.

23.2.4 When provided, gangways, passerelles, and accommodation ladders shall be manufactured to a recognised national or international standard, and be clearly marked with the manufacturer's name, the model number, the maximum design angle of use and the maximum safe loading (by number of persons and by total weight). Side screens or handrail(s) shall be provided on both sides.

23.2.5 Where gangways, passerelles or ladders do not comply with national or international standards, a manufacturer's test load certificate shall be provided. Alternatively, practical tests may be carried out to the satisfaction of the BMA. In all cases the maximum design angle, maximum number of persons, and the maximum total weight shall be clearly marked, and shall be used in accordance with the manufacturer's instructions.

23.2.6 Access equipment and immediate approaches to it shall be adequately illuminated.

23.3 Submersible Craft

23.3.1 Submersible Craft carried on yachts shall comply with the standards of the BMA[21] and:

.1 they shall be constructed and maintained in accordance with the rules of a Recognised Organisation, applicable national regulations and be suitable for the intended use;

.2 supporting equipment shall be constructed and maintained in accordance with the rules of the Recognised Organisation responsible for certificating the submersible, as well as applicable Bahamas legislation. The maximum safe working load of the equipment and maximum sea state in which the craft may be launched shall be stated;

.3 a safety management system which may be separate from any system operated by the parent vessel, including an Operations Manual, shall be in place, and subject to annual audit;

.4 following satisfactory survey and audit, certification for safety of submersible craft and its support equipment shall be issued, and is subject to annual survey;

.5 maintenance shall be carried out by the manufacturer or an organisation or person accepted by the BMA at intervals specified by the manufacturer; and

.6 operating crew shall have adequate theoretical and practical training for the type of submersible craft onboard and have demonstrated the ability to operate it.

[21] Refer to BMA Information Bulletin No.159

24 SAFETY MANAGEMENT

24.1 General Requirements

24.1.1 All vessels under 500 gross tonnage shall employ a safety management system as described in this section.

24.1.2 All vessels shall include emergency towing procedures, as required by SOLAS II-1/3-4, in their safety management system or in a separate plan.

24.2 Introduction

24.2.1 The purpose of this section is to provide guidance on how to develop and implement an effective safety management system for vessels under 500 gross tonnage, where full certification to the International Safety Management Code is not a requirement.

24.3 General

24.3.1 Each operator shall create a safe working environment, which shall include the items detailed below.

24.4 Health and Safety Protection Policy.

24..4.1 This shall address the issues of health, safety and the environment as they affect the company and its staff, both ashore and afloat. Such a policy might read along the following lines:

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

24.4.2 The Company/Owner is recommended to develop and implement an oil management plan to the same standard as the garbage management plan and to integrate it with the Health and Safety Protection Policy. This is not required for vessels over 400 gross tonnage, for which an IOPP certificate is required.

24.5 Procedures to Ensure Safe Operation of Vessels in Compliance with the Regulations and Rules.

24.5.1 The regulations and rules, not addressed by this Code of Practice, which apply to all vessels include, but are not limited to:

.1 International Regulations for Preventing Collisions at Sea;
.2 Local Navigation Rules;
.3 National health and safety regulations;
.4 The ILO Code on Accident Prevention on Ships;

.5 All relevant national shipping or guidance notices.

24.5.2 The company shall draw up simple procedures to ensure that safe working practices are carried out in the operation of the vessel. These may be in the form of checklists which can be followed by all personnel.

24.5.3 For some vessels, it might be appropriate to have permanently exhibited checklists, e.g. in the wheelhouse for navigational items. Alternatively, in a smaller vessel, the record could take any suitable form such as a diary as distinct from a specially printed logbook. Whatever form the record takes, such entries shall be accepted as evidence of compliance with the Onboard Procedures requirements (see 24.12).

24.6 Lines of Communication Between Personnel, Ashore and Afloat.

24.6.1 Responsibility and authority of each employee shall be clear. This may be best illustrated in a simple diagram, showing who reports to whom.

24.7 Procedures for Reporting Accidents.

24.7.1 The requirement for reporting accidents shall be well understood by all personnel and in so doing improve the safety culture practiced onboard.

24.8 Procedures for Responding to Emergency Situations.

24.8.1 There shall be clearly stated procedures for responding to emergency situations. These may include but not be limited to:

.1 fire
.2 collision
.3 grounding
.4 violent act
.5 main propulsion or steering failure
.6 man overboard

24.8.2 Checklists may be useful in this regard.

24.9 Health and Safety Protection Policy

24..9.1 One or more competent persons shall be delegated to take responsibility for health and safety, and that person/persons shall be clearly identified. It is the responsibility of the Company/Owner to ensure that the policy is complied with, and that the responsibilities are understood.

24.9.2 The Company/Owner shall develop a policy on prevention of alcohol and drug abuse.

24.9.3 All personnel both ashore and afloat have a duty to take care of themselves and other persons who may be affected by their acts or omissions.

24.9.4 It is essential that, in the event of an emergency, there is the ability to communicate with the emergency services via a shore base. The shore base may be the company office ashore, the local Coastguard, Police or Fire Station, or another office as may be agreed between the vessel and the shore base.

24.10 Responsibilities

24.10.1 The Master shall have authority at all times, to make decisions with regard to the safety of the vessel and the persons onboard. To ensure that there is no ambiguity regarding the authority of the Master, there shall be a simple written statement to this effect.

24.11 Personnel and Training

24.11.1 All personnel shall receive training appropriate to the tasks they undertake. It is the responsibility of the Company/Owner to ensure that this training is given, and that the personnel have an understanding of the relevant regulations and rules. As a minimum, this means:

.1 for the Master, the relevant qualifications;

.2 for the crew, relevant qualifications and any additional training appropriate to their designated duties.

24.11.2 Prior to the first occasion of working on the vessel, each employee shall receive appropriate familiarisation training and proper instruction in onboard procedures. This could include, but not necessarily be, limited to:

.1 mooring and unmooring;

.2 launching and recovery of survival craft;

.3 evacuation from all areas of the vessel;

.4 donning of lifejackets; and

.5 use and handling of firefighting equipment.

24.12 Onboard Procedures

24.12.1 Simple procedures shall be developed for the operation of the vessel. These shall include, but not be limited to:

.1 testing of equipment, including steering gear, prior to commencing a passage;

.2 navigation and handling of the vessel;

.3 maintenance routines;

.4 bunkering operations;

.5 watertight/weathertight integrity;

.6 stability of the vessel;

.7 conduct of passengers and crew while onboard;

.8 emergency towing (may be in a separate document);

.9 safe use and qualification of users for personal watercraft.

24.13 Preparation for Emergencies

24.13.1 The potential emergencies likely to be encountered by the vessel shall be considered. Exercises shall then be carried out in the handling of these emergencies and evacuation from the vessel.

24.13.2 Where possible, all personnel shall be involved in these exercises, both ashore and afloat.

24.13.3 The roles and responsibilities of all personnel in an emergency situation shall be defined.

24.13.4 The exercises shall be recorded. The names of those who participated shall also be recorded.

24.14 Reporting of Accidents

24.14.1 Vessels operating under this Code shall report any accidents to the BMA[22] and the company shall therefore have a procedure in place. Additionally, all accidents and near accidents shall be recorded and reported to the Company/Owner, who shall implement corrective action, with the aim of improving safety.

24.15 Maintenance of the Vessel and Equipment

24.15.1 Maintenance of the vessel and equipment is an essential ingredient of safety management. The equipment shall be checked and tested daily when in use, in addition to the tests referred to in section 28.

24.15.2 There shall be procedures for a more detailed inspection and maintenance programme of the vessel and equipment.

24.15.3 The frequency of the inspections shall be determined by the Company/Owner, but every event shall be recorded.

24.15.4 Where vessels comply with Section 14.10.4.9 the re-application process for the fire protection treatment shall be documented including the frequency and any limitations set by the service supplier.

24.15.5 A checklist could be employed as an aide memoir for the inspection of equipment.

24.16 Review

24.16.1 Every Company/Owner shall undertake a review of the safety management system of all vessels at least once in every three years.

[22] Refer to BMA Information Bulletin No.4

25 SECURITY

25.1 General Requirements

25.1.1 Vessels of less than 500 gross tonnage are not required to comply with the ISPS Code but are required to be vigilant regarding both the security of their own yacht, to prevent it being used without authorisation, and the activities of other vessels in their vicinity, reporting any suspicious activity to the authorities.

25.1.2 Advice for non-ISPS vessels is provided in IMO Circular MSC.1/Circ.1283.

26 MANNING, CERTIFICATION, TRAINING AND HOURS OF REST

26.1 Passengers

26.1.1 "Passenger" means any person carried in a ship except:

.1 "Seafarers" as defined in section 2;

.2 "Occasional Workers" as described in 26.2;

.3 a person on board the ship either in pursuance of the obligation laid upon the master to carry shipwrecked, distressed or other persons, or by reason of any circumstances that neither the master nor the owner nor the charterer (if any) could have prevented; and

.4 a child under one year of age.

26.2 Occasional Workers

26.2.1 It is not unusual for vessels to carry occasional additional staff, working in service for the owner or charterer for example, a nanny, masseuse or bodyguard. If the individual normally works on shore and is only on board for a short period of time, with no emergency duties, they may not fall within the definition of a "seafarer" for the purposes of the MLC. In such cases, these occasional workers shall:

.1 have no emergency duties;

.2 for their own protection, and the safety of other members of the crew, shall have familiarisation training on board such that they are capable of being self-sufficient in an emergency;

.3 have a berth and access to mess areas and sanitary facilities of a standard which are in accordance with the crew accommodation standards applicable to the keel laying date of the yacht for existing yachts.

.4 be at least 16 years of age;

.5 be medically fit to carry out their duties and to be self-sufficient in an emergency, although a seafarer's medical fitness certificate is not required;

.6 have a contract of employment, providing equivalent protection to that available under the MLC, taking into account their duties, pattern of working, normal place of work, and other relevant factors. It is recommended that the contract make reference to working in some capacity onboard the named yacht - this could be an addendum to the employee's shore-based contract;

.7 shall not be required to meet the cost of food or medical care onboard, or of their travel back from the vessel to their normal place of work/home; and

.8 be trained to ensure their own health and safety onboard.

26.2.2 If any of the above criteria are not met or cannot be demonstrated to the satisfaction of the BMA, the individual shall be considered a passenger.

26.2.3 Every person working on the vessel shall be included on the list of crew unless they are treated as passengers. The Master shall therefore include occasional workers on the crew list named as such (or simply 'nanny' or 'bodyguard').

26.3 Trainees

26.3.1 A trainee **SHALL**:

.1 be engaged for the sole purpose of:

i. obtaining instruction in the principles of responsibility, resourcefulness, loyalty and team endeavour; and/or

ii. instruction in navigation and seamanship, marine engineering, or other shipboard related skills;

.2 be considered to form part of a "trainee voyage crew";

.3 participate in the operation of the vessel to the best of his or her ability; and

.4 be not less than twelve (12) years old.

26.3.1 A trainee **SHALL NOT**:

.1 be part of the crew for the purpose of safe manning or have any safety critical duties;

.2 have any employment contract or any employment relationship with the owner or operator of the vessel;

.3 receive any remuneration for his or her activities on board;

.4 be considered to be a seafarer for the purpose of MLC, 2006, as amended; and

.5 be considered as a passenger*.

* Note – the fact that a trainee or trainees may contribute towards the cost of their welfare whilst on board should not imply that they are passengers.

26.4 Safe Manning

26.4.1 General

26.4.1.1 All yachts to which this Code applies shall carry, in addition to the master, a sufficient number of qualified deck and engineer officers, together with a sufficient number of appropriately qualified ratings, to ensure that the yacht can at all times be operated safely, with respect to the safety of the yacht and all persons onboard, the protection of the marine environment and maritime security.

26.4.2 Principles of Safe Manning

26.4.2.1 In assessing the appropriate safe manning level for a yacht due regard shall be given to:

.1 IMO Resolution A.1047(27) (as amended from time to time) which defines the principles of safe manning necessary to ensure the safe operation of ship and the prevention of pollution of the marine environment;

.2 applicable international conventions, including STCW and the MLC; and

.3 Bahamas legislation relating to Safe Manning Certification, Hours of Work and Rest and related matters.

26.4.3 Responsibility for Safe Manning:

26.4.3.1 It is the responsibility of the owner, master and operators of yachts to ensure that at all times the vessel is safely manned and operated in compliance with the standards of

safety, marine environment protection and security set out in the various applicable international Conventions, Codes and Bahamas legislation and in accordance with any Minimum Safe Manning Document or similar certification in force with respect to the ship.

26.4.3.2 In particular, yachts shall have a dedicated person on watch whilst any passengers are on board.

26.4.3.3 In assessing the appropriate level of manning for a yacht the following factors, in addition to those in 26.4.2.1 are among those which shall be taken into account-

.1 the size, type and complexity of the yacht and its equipment;

.2 type and size of the yacht's main propulsion and auxiliary machinery;

.3 the area and type of operation in which the yacht shall be engaged including-

i. likely navigational and other hazards to be encountered;

ii. frequency of port calls;

iii. density of traffic; and

iv. the demands on the master, officers and crew in the normal day to day running of the yacht over and above safety and marine environmental protection considerations;

.4 the need to mount safe navigational and engine watches at sea, at anchor and in port;

.5 peak workloads;

.6 the need to provide statutory periods of rest;

.7 on-board maintenance requirements;

.8 on-board mooring and unmooring arrangements;

.9 emergency situations and procedures including the mustering and evacuation of passengers;

.10 compliance with the yacht's Safety Management System;

.11 compliance with Maritime Security requirements; and

.12 Minimum Safe Manning Document.

26.4.3.4 Vessels below 500 gross tonnage may choose to hold a Minimum Safe Manning Document. This shall allow the owner to consider a 'range and risk' approach when determining manning levels.

26.4.3.5 In the event of any change in equipment, construction or use of the vessel, which may affect the safe manning level, the owner or operator shall make an application for the issue of a new Minimum Safe Manning Document.

26.4.3.6 The Minimum Safe Manning Document of a vessel may be withdrawn if an owner or operator fails to submit a new proposal where a vessel changes trading area(s), construction, machinery or equipment, or operation and/or method of maintenance have changed, or a vessel persistently fails to comply with the hours of rest requirements.

26.4.4 *Application for a Minimum Safe Manning Document:*

26.4.4.1 Owners of vessels to which the Code applies that wish to apply for a Minimum Safe Manning Document shall make the application to the BMA, in accordance with BMA Information Bulletin No.115. The application may be made by the owner or operator of the yacht or a person duly authorised to act in this regard and the application shall present a clear rationale on which the proposed manning is based, including-

.1 an explanation of how the proposed manning has been determined;

.2 Confirmation that the assessment has taken account, as a minimum, of all the relevant guidelines as set out in this Section;

.3 how the requirements relating to hours of work and rest shall be complied with; and

.4 details of the yacht in terms of its size, layout, equipment propulsion and auxiliary machinery and other such relevant factors affecting manning levels[23]

26.4.4.3 More than one proposal for safe manning for the same yacht may be submitted to take account of differing operational patterns or a variation in the number of passengers carried.

26.4.5 *Qualifications and Training:*

26.4.5.1 In general terms the master and officers serving on a yacht to which this Code applies shall be certificated in accordance with the relevant provisions of STCW or appropriate Yacht qualifications accepted by the BMA.

26.4.5.2 Any person employed or engaged in any capacity onboard a yacht to which this Code applies, other than a seafarer employed or engaged as such in accordance with 26.4.3.1, shall be deemed to be a passenger unless such person has satisfactorily undergone familiarisation training and instruction in accordance with the Code to the STCW[24] and is in possession of appropriate documentation attesting to the satisfactory completion of such familiarisation training and instruction.

26.4.5.3 Any seafarer employed or engaged in any capacity onboard a yacht to which this Code applies, on the business of that yacht as part of the complement with designated safety or pollution prevention duties in the operation of the ship shall, in addition to the familiarisation training referred to in subsection 26.4.5.2 and before being assigned to any shipboard duties, have received basic safety training and instruction in accordance with the Code to the STCW[25] and be in possession of appropriate documentation attesting to the satisfactory completion of such training and instruction.

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[23] To effectively convey the general layout and equipment of the yacht, including mooring and un-mooring arrangements, appropriate plans shall be submitted which shall include a General Arrangement Plan

[24] See Section A-VI/1 of Part A of the Code to the STCW paragraph 1

[25] See Section A-VI/1 of Part A of the Code to the STCW paragraph 2

26.4.5.4 The number of trained persons shall always be sufficient to assist the total number of passengers who may be onboard at any one time.

26.5 Medical Fitness

26.5.1 All seafarers serving onboard vessels to which the Code applies shall be in possession of a valid Medical Fitness Certificate issued or recognised by the BMA.

26.6 Schedule of Duties

26.6.1 The Master shall ensure that a schedule of duties is drawn up setting out the hours of work and rest periods for each of the crew. The table or schedule shall show:

.1 the schedule of duties at sea and duties in port; and

.2 the minimum hours of rest as defined by the MLC.

26.6.2 In devising the schedule, operators shall take account of factors such as:

.1 nature of the operation;

.2 type and size of vessel;

.3 construction and technical equipment of the vessel;

.4 manning levels and changes in crew numbers due to crew changes and sickness;

.5 the maximum period of continuous watchkeeping;

.6 minimum rest periods;

.7 total workload;

.8 compliance with the ISPS Code as applicable; and

.9 the seriousness of irregular working hours and their contribution to causing fatigue and the importance of scheduling reasonably stable working hours.

26.6.3 Changes shall not be made to the schedule of duties unless they can be justified by substantially altered work patterns or other significant factors.

26.6.4 Where it is known that a vessel engages in an irregular pattern or that working hours are unlikely to be uniform, this can be taken into account when considering the schedule.

26.6.5 It is not necessary to draw up a new schedule of duties for each voyage, so long as it is applicable to the voyage in question and the composition of the crew for whom it was originally intended has not changed.

26.6.6 A copy of the schedule shall be made available to all members of the crew.

26.7 Hours of Work and Rest:

26.7.1 All members of the yacht's complement, including the Master, shall have minimum rest periods and maximum periods on duty (emergencies excepted) in accordance with the provisions of the STCW, MLC and national legislation.

26.7.2 Owners and operators of yachts shall ensure that the master, officers and ratings do not work more hours than is safe in relation to the performance of their duties and the safety

of the ship. The master shall ensure that suitable arrangements are in place with respect to the assignment of duties - manning levels shall therefore be such as to ensure that the master, officers and crew are afforded the opportunity to take the minimum rest periods.

26.7.3 The time and place of rest periods shall be such as to ensure that such periods can be taken in a suitable environment conducive to achieving effective rest.

26.7.4 Further guidance about fitness for duty is contained in section B-VIII/1 of the STCW.

26.7.5 *Minimum Hours of Rest*

26.7.5.1 The owner/operator or Master shall ensure that the crew are provided with at least the minimum hours of rest. These shall not be less than:

.1 10 hours in any 24-hour period; and

.2 77 hours in any seven-day period.

26.7.5.2 Hours of rest may be divided into no more than 2 periods; one of which shall be at least 6 hours long, and the interval in between shall not exceed 14 hours.

26.7.5.3 It is expected that as far as practicable the Master shall arrange for conducting emergency drills such as musters, fire-fighting and abandon vessel drills in a way which minimises the disturbance to rest periods and provide compensatory rest for seafarers whose normal rest is disturbed by call-outs for drills.

26.7.6 *Records*

26.7.6.1 A record of the actual hours of work performed by the individual seafarer shall be maintained onboard, in order to verify that the minimum periods of rest required under applicable international instruments and national legislation have been complied with.

26.7.6.2 The master or authorised person is responsible for ensuring that records of hours of rest are maintained for each of the crew serving on the vessel. Each record shall be endorsed by the master or authorised person and the seafarer. A copy shall be retained by the seafarer.

26.7.6.3 In an emergency, or when unforeseen events occur, changes may be unavoidable. In these cases, records shall reflect all deviations from the schedule.

26.7.6.4 All records shall be kept for a minimum of 12 months and shall be available for inspection at any time. Checking of the vessel's records may be carried out by the BMA as part of the normal routine of vessel inspection and shall include a check that the appropriate schedules are available, and records maintained

26.7.7 *Exceptions for Emergencies*

26.7.7.1 Situations may arise in which a seafarer may be required to work during scheduled hours of rest. These include emergencies which threaten the safety of the vessel or put life at risk. In these circumstances, the limits may be exceeded provided compensatory arrangements are subsequently made to avoid fatigue.

26.7.8 *On-Call Time*

26.7.8.1 Where a seafarer's normal period of rest onboard a vessel is disturbed by a callout he/she shall have adequate compensatory rest.

26.8 Personal Watercraft

26.8.1 The operators are reminded that operation of personal watercraft shall comply with the applicable legislation of the State in whose waters they are being operated.

27 MEDICAL CARE AND CARRIAGE OF MEDICAL STORES

27.1 Medical Care for Seafarers

27.1.1 The requirements for onboard health and medical care set out in this section include standards for measures aimed at providing seafarers with health protection and medical care as comparable as possible to that which is generally available to workers ashore.

27.1.2 The health protection and medical care shall in principle be provided at no cost to the seafarers.

27.1.3 The employer and master shall ensure that all seafarers are covered by adequate measures providing for health protection and medical care, including essential dental and optical care which-

.1 ensure the application to seafarers of any general provisions on occupational health protection and medical care relevant to their duties, as well as special provisions specific to work onboard ship;

.2 give seafarers the right to visit a qualified medical doctor or dentist without delay in ports of call, where practicable;

.3 ensure that seafarers are given health protection and medical care as comparable as possible to that which is generally available to workers ashore, including prompt access to the necessary medicines, medical equipment and facilities for diagnosis and treatment and to medical information and expertise;

.4 give seafarers the right to visit a qualified medical doctor or dentist without delay in ports of call, where practicable;

.5 are not limited to treatment of sick or injured seafarers but include measures of a preventative character such as health promotion and health education programmes; and

.6 minimise the risk of infection and ensure appropriate preventative measures such as immunisation are taken.

27.2 Provision of On-board Medical Care:

27.2.1 The carriage of medical stores and equipment as provided for in this section is designed to provide an appropriate level of primary care for all persons onboard pending, where necessary, the provision of shore based medical services.

27.3 Medical Cabinet

27.3.1 A cabinet or other suitable facility for storing medicines and other medical stores shall be provided and the cabinet, shall be well ventilated and fitted in a place in the crew area of the ship which is-

.1 always dry;

.2 readily accessible from (but not sited in) the permanent or temporary hospital; and

.3 not subject to abnormal heat.

27.3.2 The medical cabinet shall be provided with the following-

.1 an outer door with an efficient lock;

.2 where controlled drugs shall be stored, an inner cupboard fitted with a door and a lock which cannot be opened by the same key as the lock to the outer door;

.3 suitable arrangements for the storage of the medicines, medical stores and associated measuring devices; and

.4 a dispensing counter with a surface that can be easily kept clean.

27.3.3 The medical cabinet shall be lit by an electric light (which may be inside or immediately outside it) which enables the contents to be clearly seen.

27.4 Carriage of Medical Stores

27.4.1 The ship shall carry onboard medical stores and equipment as specified by the BMA in MN041.

27.5 Standards of Medical Stores

27.5.1 All medical stores required to be kept onboard ship shall conform to the standards and requirements of the IMO/ILO/WHO International Medical Guide for Ships (latest edition) or equivalent.

27.6 Carriage of Medical Guides

27.6.1 The ship shall carry guides as to the use of medical stores specified in 27.4.1 including, in particular, instructions for the use of antidotes.

27.7 Medical Advice

27.7.1 All ships shall carry a complete and up-to-date list of radio stations through which medical advice can be obtained; and if equipped with a system of satellite communication, carry an up-to-date and complete list of coast earth stations through which medical advice can be obtained. Seafarers with responsibility for medical care or medical first aid onboard shall be instructed in the use of the ship's medical guide and the medical section of the most recent edition of the International Code of Signals so as to enable them to understand the type of information needed by the advising doctor as well as the advice received.

27.8 Inspection of Medicines and Medical Stores

27.8.1 The medicine chest and its contents, as well as the medical equipment and medical guide carried onboard, shall be properly maintained and inspected at regular intervals, not exceeding 12 months, by a competent person or authority, who shall ensure that the labelling, expiry dates and conditions of storage of all medicines and directions for their use are checked and all equipment functioning as required.

27.9 Medically Trained Personnel

27.9.1 Yachts are not required to carry a doctor but the master shall ensure that any medical attention or treatment administered onboard to any person is given either by the master

or under his supervision by a person so appointed by him for the purpose provided that the person so appointed shall have received medical training to an appropriate level in accordance with the STCW Convention.

28 OPERATIONAL READINESS, MAINTERNACE & INSPECTIONS

28.1 Life-Saving Appliances and Arrangements

28.1.1 Operational Readiness

28.1.1.1 Before the ship leaves port and at all times during the voyage, all life-saving appliances shall be in working order and ready for immediate use.

28.1.2 Maintenance of Life Saving Appliances

28.1.2.1 Maintenance, testing and inspections of life–saving appliances shall be carried out based on IMO requirements[26] and in a manner having due regard to ensuring reliability of such appliances.

28.1.2.2 Instructions for on-board maintenance of life-saving appliances complying with 28.1.10 shall be provided and maintenance shall be carried out accordingly.

28.1.2.3 The BMA may accept, in compliance with the requirements of 28.1.2.2, a shipboard planned maintenance programme, which includes the items covered in the list required in accordance with 28.1.10.

28.1.3 Maintenance of Falls

28.1.3.1 Falls used in launching shall be inspected periodically with special regard for areas passing through sheaves and renewed when necessary due to deterioration of the falls or at intervals of not more than 5 years, whichever is the earlier.

28.1.4 Spares and Repair Equipment

28.1.4.1 Spares and repair equipment shall be provided for life-saving appliances and their components which are subject to excessive wear or consumption and shall be replaced regularly.

28.1.5 Weekly Tests and Inspections

28.1.5.1 The following tests and inspections shall be carried out weekly and a report on them shall be entered in the log-book:

.1 all survival craft, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use and the inspection shall include, but not be limited to, the condition of hooks, their attachment to the lifeboat and the confirmation that the on-load release gear has been properly and completely reset;

.2 all engines in lifeboats and rescue boats shall be run for a total period of not less than 3 minutes, provided the ambient temperature is above the minimum

[26] Refer to the Guidelines for periodic servicing and maintenance of lifeboats, launching appliances and onload release gear MSC.402(96)

temperature required for starting and running the engine and during this period of time it shall be demonstrated that the gear box and gear box train are engaging satisfactorily;

.3 if the special characteristics of an outboard motor fitted to a rescue boat would not allow it to be run for a period of 3 minutes other than with its propeller submerged, a suitable water supply may be provided; and

.4 the general emergency alarm shall be tested.

28.1.6 Monthly Tests and Inspections

28.1.6.1 The following tests and inspections shall be carried out monthly and a report on them shall be entered in the log-book:

.1 all lifeboats, except free-fall lifeboats, shall be turned out from their stowed position, without any persons onboard, if weather and sea conditions so allow; and

.2 inspection of the life-saving appliances, including lifeboat equipment, shall be carried out using the checklist required by subsection 28.1.10 to ensure that they are complete and in good order.

28.1.7 Servicing of Life Saving Appliances and Systems

28.1.7.1 Every inflatable liferaft, inflatable lifejacket, marine evacuation system and inflated rescue boat shall be serviced:

.1 at intervals not exceeding 12 months, provided where in any case this is impracticable, the BMA may extend this period to 17 months; and

.2 at an approved servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel[27].

28.1.7.2 The BMA allows extended service intervals on new and novel inflatable liferaft arrangements on the following conditions-

.1 the new and novel liferaft arrangement has proved to maintain the same standard, as required by testing procedure, during extended service intervals.

.2 the liferaft system shall be checked onboard by certified personnel at intervals set out in 28.1.6.1.2.

.3 service at intervals not exceeding five years shall be carried out in accordance with the recommendations of the IMO[28].

[27] Refer to the Recommendation on conditions for the approval of servicing stations for inflatable liferafts, adopted by the IMO by Resolution A.761(18), as amended by MSC.55(66).

[28] Refer to the Recommendation on conditions for the approval of servicing stations for inflatable liferafts, adopted by the IMO by Resolution A.761(18), as amended by MSC.55(66). Account shall also be taken of the service period for the equipment recommended by the manufacturer

28.1.7.4 All repairs and maintenance of inflated rescue boats shall be carried out in accordance with the manufacturer's instructions; emergency repairs may be carried out onboard the ship; however, permanent repairs shall be effected at an approved servicing station.

28.1.8 Servicing of Life Saving Appliances and Systems

28.1.8.1 Hydrostatic release units, other than disposable hydrostatic release units, shall be serviced-

.1 at intervals not exceeding 12 months, provided where in any case this is impracticable, the BMA may extend this period to 17 months[29]; and

.2 at a servicing station which is competent to service them, maintains proper servicing facilities and uses only properly trained personnel.

28.1.9 Periodic Servicing of Launching Appliances and on-Load Release Gear

28.1.9.1 Launching appliances shall be-

.1 maintained in accordance with instructions for on-board maintenance as required by 28.1.10.

.2 subject to a thorough examination at the annual surveys required by SOLAS I/7 or 8, as applicable; and

.3 upon completion of the examination referred to in paragraph .2 above, subjected to a dynamic test of the winch brake at maximum lowering speed and the load to be applied shall be the mass of the survival craft or rescue boat without persons onboard, provided that, at intervals not exceeding five years, the test shall be carried out with a proof load equal to 1.1 times the weight of the survival craft or rescue boat and its full complement of persons and equipment.

28.1.9.2 Lifeboat or rescue boat on-load release gear shall be-

.1 maintained in accordance with instructions for on-board maintenance as required by 28.1.10;

.2 subject to a thorough examination and operational test during the annual surveys required by SOLAS I/7 or 8, as applicable; and

.3 operationally tested under a load of 1.1 times the total mass of the boat when loaded with its full complement of persons and equipment whenever the release gear is overhauled provided that such over-hauling and tests shall be carried out at least once every five years[30].

[29] Refer to MSC/Circ.955, Servicing of life-saving appliances and Radiocommunication equipment under the harmonized system of survey and certification (HSSC).

[30] Refer to the Recommendation on testing of life-saving appliances, adopted by the IMO by resolution A.689(17). For life-saving appliances installed onboard on or after 1 July 1999, refer to the Revised Recommendations on testing of life-saving appliances, adopted by the IMO by resolution MSC.81(70)

28.1.10 *Instructions for on-board maintenance*

28.1.10.1 Instructions for on-board maintenance of life-saving appliances shall be easily understood, illustrated wherever possible, and, as appropriate, shall include the following for each appliance-

.1 a checklist for use when carrying out the inspections required by 28.1.6.1.2;
.2 maintenance and repair instructions;
.3 a schedule of periodic maintenance;
.4 a diagram of lubrication points with the recommended lubricants;
.5 a list of replaceable parts;
.6 a list of sources of spare parts; and
.7 a log for records of inspections and maintenance.

28.1.11 *Rotational Deployment of Marine Evacuation Systems*

28.1.11.1 In addition to or in conjunction with the servicing intervals of marine evacuation systems required by 28.1.7.1.2, each marine evacuation system shall be deployed[31] from the ship on a rotational basis at intervals shall be agreed by the BMA provided that each system shall be deployed at least once every six years.

28.1.12 *Marking of Stowage Locations*

28.1.12.1 Containers, brackets, racks, and other similar stowage locations for life-saving equipment, shall be marked with symbols in accordance with the recommendations of the IMO[32], indicating the devices stowed in that location for that purpose and where more than one device is stowed in that location, the number of devices shall also be indicated.

28.2 Construction - Fire protection, fire detection and fire extinguishing

28.2.1 *Purpose*

28.2.1.1 The purpose of this section is to maintain and monitor the effectiveness of the fire safety measures the ship is provided with. For this purpose, the following functional requirements shall be met:

.1 fire protection systems and fire-fighting systems and appliances shall be maintained ready for use; and
.2 fire protection systems and fire-fighting systems and appliances shall be properly tested and inspected.

[31] Results of MES rotational deployments shall be reported to the Administration as per BMA Information Bulletin No.174 - Marine Evacuation Systems

[32] Refer to the Symbols related to life-saving appliances and arrangements, adopted by the IMO by Resolution A.760(18), as amended by MSC.82(70).

28.2.2 *General Requirements*

28.2.2.1 At all times while the ship is in service, the requirements of section 28 shall be complied with. A ship is not in service when:

.1 it is in for repairs or lay-up (either at anchor or in port) or in dry-dock;

.2 it is declared not in service by the owner or the owner's representative; or

.3 there are no passengers onboard.

28.2.2.3 The following fire protection systems shall be kept in good order so as to ensure their required performance if a fire occurs-

.1 structural fire protection, including fire-resisting divisions, and protection of openings and penetrations in these divisions;

.2 fire detection and fire alarm systems; and

.3 means of escape systems and appliances.

28.2.2.4 Fire-fighting systems and appliances shall be kept in good working order and readily available for immediate use. Portable extinguishers which have been discharged shall be immediately recharged or replaced with an equivalent unit.

28.2.2.5 Maintenance, testing and inspections shall be carried out based on the guidelines developed by the IMO[33] and in a manner having due regard to ensuring the reliability of fire-fighting systems and appliances.

28.2.2.6 The maintenance plan shall be kept on board the ship and shall be available for inspection whenever required by the BMA.

28.2.2.7 The maintenance plan, which may be computer based, shall include at least the following fire protection systems and fire-fighting systems and appliances, where installed:

.1 fire mains, fire pumps and hydrants, including hoses, nozzles and international shore connections;

.2 fixed fire detection and fire alarm systems;

.3 fixed fire-extinguishing systems and other fire-extinguishing appliances;

.4 automatic sprinkler, fire detection and fire alarm systems;

.5 ventilation systems, including fire and smoke dampers, fans and their controls;

.6 emergency shutdown of fuel supply;

.7 fire doors, including their controls;

.8 general emergency alarm systems;

.9 emergency escape breathing devices;

.10 portable fire extinguishers, including spare charges; and

.11 firefighter's outfits.

[33] Refer to the revised guidelines for the on maintenance and inspection of fire protection systems and appliances (MSC.1/ Circ.1432).

29 EMERGENCY TRAINING & DRILLS

29.1 Life-Saving Appliances and Arrangements

29.1.1 *Duties, Musters and Briefings*

29.1.1.1 On a ship engaged on a voyage where passengers are scheduled to be onboard for more than 24 hours, musters of newly embarked passengers shall take place prior to or immediately upon departure. Passengers shall be instructed in the use of the lifejackets and the action to take in an emergency.

29.1.1.2 Whenever new passengers embark, a passenger safety briefing shall be given immediately before departure, or immediately after departure. The briefing shall be made by means of an announcement, in one or more languages likely to be understood by the passengers. The announcement shall be made on the ship's public address system, or by other equivalent means likely to be heard at least by the passengers who have not yet heard it during the voyage. The briefing may be included in the muster required by 29.1.1.1. Information cards or posters or video programmes displayed on ships video displays may be used to supplement the briefing but may not be used to replace the announcement.

29.1.1.3 The briefings referred to in 29.1.1.2 may be delivered using alternative communication methods of conveying the required information, provided that such alternative is at least as effective.

29.1.1.4 Crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill to be held onboard the ship at least once every two months. It is recommended that seafarers should be provided with the necessary training, instructions and information on entry into dangerous spaces[34].

29.1.2 *Emergency Drills*

29.1.2.1 Drills shall, as far as practicable, be conducted as if there were an actual emergency.

29.1.2.2 Every crew member shall participate in at least one abandon ship drill and one fire drill every month and:

.1 where more than 25% of the crew have not participated in abandon ship and fire drills onboard that particular ship in the previous month the drills of the crew shall take place within 24 hours of the ship leaving a port;

.2 where a ship enters service for the first time, after modification of a major character or when a new crew is engaged, the drills shall be held before the vessel sails, provided that the BMA may accept other arrangements that are at least equivalent where this is impracticable.

[34] Please refer to ILO Accident Prevention on Board Ship section 10.11.3

29.1.2.3 Each abandon ship drill shall include-

.1 summoning of passengers and crew to muster stations with the general emergency alarm followed by drill announcement on the public address or other communication system and ensuring that they are made aware of the order to abandon ship;

.2 reporting to stations and preparing for the duties described in the muster list;

.3 checking that passengers and crew are suitably dressed;

.4 checking that lifejackets are correctly donned;

.5 lowering of at least one lifeboat after any necessary preparation for launching;

.6 starting and operating the lifeboat engine;

.7 operation of davits used for launching liferafts;

.8 a mock search and rescue of passengers trapped in their staterooms; and

.9 instruction in the use of radio life-saving appliances.

29.1.2.4 Different lifeboats shall, as far as practicable, be lowered in compliance with the requirements of 29.2.3.5, at successive drills.

29.1.2.5 Except as provided in 29.2.6, each lifeboat shall be launched, and manoeuvred in the water by its assigned operating crew, at least once every three months during an abandon ship drill.

29.1.2.6 The BMA may allow ships operating on short international voyages not to launch the lifeboats on one side if their berthing arrangements in port and their trading patterns do not permit launching of lifeboats on that side, provided that all such lifeboats shall be lowered at least once every three months and launched at least annually.

29.1.2.7 As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue boats, shall be launched each month with their assigned crew aboard and manoeuvred in the water and in any case this requirement shall be complied with at least once every three months.

29.1.2.8 If lifeboat and rescue boat launching drills are carried out with the ship making headway, such drills shall, because of the dangers involved, be practiced in sheltered waters only and under the supervision of an officer experienced in such drills.

29.1.2.9 If a ship is fitted with marine evacuation systems-

.1 drills shall include exercising of the procedures required for the deployment of such a system up to the point immediately preceding actual deployment;

.2 this aspect of drills shall be augmented by regular instruction using the on-board training aids in the use of the system; and

.3 every system party member shall, as far as practicable, be further trained by participation in a full deployment of a similar system into water, either onboard a

ship or ashore, at intervals of not more than three years; provided that this training can be associated with the rotational deployments required by 28.1.11.

29.1.2.10 Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill

29.1.3 *Fire Drills*.

29.1.3.1 Fire drills shall be planned in such a way that due consideration is given to regular practice in the various emergencies that may occur.

29.1.3.2 Each fire drill shall include-

.1 reporting to stations and preparing for the duties;

.2 starting of a fire pump, using at least the two required jets of water to show that the system is in proper working order;

.3 checking of fireman's outfit and other personal rescue equipment;

.4 checking of relevant communication equipment;

.5 checking the operation of watertight doors, fire doors, fire dampers and main inlets and outlets of ventilation systems in the drill area; and

.6 checking the necessary arrangements for subsequent abandoning of the ship.

29.1.3.3 The equipment used during drills shall immediately be brought back to its fully operational condition and any faults and defects discovered during the drills shall be remedied as soon as possible.

29.1.4 *Enclosed space entry and rescue drills*

29.1.4.1 Enclosed space entry and rescue drills shall be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the IMO[35].

29.1.4.2 Each enclosed space entry and rescue drill shall include:

.1 checking and use of personal protective equipment required for entry;

.2 checking and use of communication equipment and procedures;

.3 checking and use of instruments for measuring the atmosphere in enclosed spaces;

.4 checking and use of rescue equipment and procedures; and

.5 instructions in first aid and resuscitation techniques.

29.1.5 *On-board Training and Instructions*

29.1.5.1 On-board training in the use of the ship's life-saving appliances, including survival craft equipment, and in the use of the ship's fire-extinguishing appliances shall:

[35] See IMO Resolution A.1050(27) – Revised Recommendations for Entering Enclosed Spaces Aboard Ships

.1 subject to 29.5.1.2, be given as soon as possible but not later than two weeks after a crew member joins the ship;

.2 if the crew member is on a regularly scheduled rotating assignment to the ship, such training shall be given not later than two weeks after the time of first joining the ship;

.3 include instructions in the use of the ship's fire-extinguishing appliances, life-saving appliances, and in survival at sea, which shall be given at the same interval as the drills;

.4 Incorporate individual instruction covering different parts of the ship's life-saving and fire-extinguishing appliances, such that all the ship's life-saving and fire-extinguishing appliances shall be covered within any period of two months.

29.1.5.2 Every crew member shall be given instructions which shall include but not necessarily be limited to:

.1 the operation and use of the ship's inflatable liferafts;

.2 the problems of hypothermia, first-aid treatment for hypothermia and other appropriate first-aid procedures;

.3 any special instructions necessary for use of the ship's life-saving appliances in severe weather and severe sea conditions;

.4 the operation and use of fire-extinguishing appliances; and

.5 risks associated with enclosed spaces and onboard procedures for safe entry into such spaces which shall take into account, as appropriate, the guidance provided in recommendations developed by the IMO[36].

29.1.5.3 On-board training in the use of davit-launched liferafts shall take place at intervals of not more than 4 months on every ship fitted with such appliances. Whenever practicable this shall include the inflation and lowering of a liferaft. This liferaft may be a designated liferaft intended for training purposes only, which is not part of the ship's life-saving equipment; such a designated liferaft shall be conspicuously marked.

29.1.6 *Records*

29.1.6.1 The date when musters are held, details of abandon ship drills and fire drills, enclosed space entry and rescue drills, drills of other life-saving appliances and onboard training shall be recorded in the Official Log Book. If a full muster, drill or training session is not held at the appointed time, an entry shall be made in the Official Log Book stating the circumstances and the extent of the muster, drill or training session held.

[36] See IMO Resolution A.1050(27) – Revised Recommendations for Entering Enclosed Spaces Aboard Ships

29.1.7 *Training Manual and On-board Training Aids*

29.1.7.1 A training manual complying with the requirements contained in subsections 29.1.7.2 to 29.1.7.4 shall be provided in each crew mess room and recreation room or in each crew cabin.

29.1.7.2 Subject to subsection 29.7.3, the training manual, which may comprise several volumes, shall contain instructions and information, in easily understood terms, illustrated wherever possible, on the life-saving appliances provided in the ship and on the best methods of survival.

29.1.7.3 Any part of such information as is contained in the manual may be provided in the form of audio-visual aids in lieu of the manual.

29.1.7.4 The following shall be explained in detail in the manual or through the audio-visual aids, as the case may be:

.1 donning of lifejackets, immersion suits and anti-exposure suits, as appropriate;
.2 muster at the assigned stations;
.3 boarding, launching, and clearing the survival craft and rescue boats, including, where applicable, use of marine evacuation systems;
.4 method of launching from within the survival craft;
.5 release from launching appliances;
.6 methods and use of devices for protection in launching areas, where appropriate;
.7 illumination in launching areas;
.8 use of all survival equipment;
.9 use of all detection equipment;
.10 with the assistance of illustrations, the use of radio lifesaving appliances;
.11 use of drogues;
.12 use of engine and accessories;
.13 recovery of survival craft and rescue boats including stowage and securing;
.14 hazards of exposure and the need for warm clothing;
.15 best use of the survival craft facilities in order to survive;
.16 methods of retrieval, including the use of helicopter rescue gear (slings, baskets, stretchers), breeches-buoy and shore life-saving apparatus and ship's line-throwing apparatus;
.17 all other functions contained in the muster list and emergency instructions; and
.18 instructions for emergency repair of the life-saving appliances.

29.1.7.5 Every ship fitted with a marine evacuation system shall be provided with on-board training aids in the use of the system.

29.1.7.6 The training manual shall be written in English and, where the working language of the crew is not English, in such working language as appropriate.

29.2 Construction - Fire protection, fire detection and fire extinction

29.2.1 Instructions, On-board Training and Drills:

29.2.1.1 The purpose of this section is to mitigate the consequences of fire by means of proper instructions for training and drills of persons onboard in correct procedures under emergency conditions and for this purpose, the crew shall have the necessary knowledge and skills to handle fire emergency cases, including passenger care.

29.2.1.2 Crew members shall receive instruction on fire safety onboard the ship.

29.2.1.3 Crew members shall receive instructions on their assigned duties.

29.2.1.4 Parties responsible for fire extinguishing shall be organised and such parties shall have the capability to complete their duties at all times while the ship is in service.

29.2.1.5 Crew members shall be trained to be familiar with the arrangements of the ship as well as the location and operation of any fire-fighting systems and appliances that they may be called upon to use.

29.2.1.6 Training in the use of the emergency escape breathing devices shall be considered as part of on-board training.

29.2.1.7 Performance of crew members assigned fire-fighting duties shall be periodically evaluated by conducting on-board training and drills to identify areas in need of improvement, to ensure competency in fire-fighting skills is maintained, and to ensure the operational readiness of the fire-fighting organisation.

29.2.1.8 On-board training in the use of the ship's fire-extinguishing systems and appliances shall be planned and conducted in accordance with the provisions of 29.5.1.

29.2.1.9 Fire drills shall be conducted and recorded in accordance with the provisions of section C1.3.1 to C1.3.3 & C1.6.1.

29.2.1.10 A training manual shall be provided in each crew mess room and recreation room or in each crew cabin.

29.2.1.11 The training manual shall be written in the working language of the ship.

29.2.1.12 The training manual, which may comprise several volumes, shall contain the instructions and information required in C1.2.9 in easily understood terms and illustrated wherever possible; any part of such information may be provided in the form of audio-visual aids in lieu of the manual.

29.2.1.13 The training manual shall explain the following in detail-

.1 general fire safety practice and precautions related to the dangers of smoking, electrical hazards, flammable liquids and similar common shipboard hazards;
.2 general instructions on fire-fighting activities and fire-fighting procedures, including procedures for notification of a fire and use of manually operated call points;
.3 meanings of the ship's alarms;
.4 operation and use of fire-fighting systems and appliances;
.5 operation and use of fire doors;
.6 operation and use of fire and smoke dampers; and
.7 escape systems and appliances.

29.2.1.14 General arrangement plans[37] shall be permanently exhibited for the guidance of the ship's officers, showing clearly for each deck the control stations, the various fire sections enclosed by "A" class divisions, the sections enclosed by "B" class divisions together with particulars of the fire detection and fire alarm systems, the sprinkler installation, the fire-extinguishing appliances, means of access to different compartments, decks, etc., and the ventilating system, including particulars of the fan control positions, the position of dampers and identification numbers of the ventilating fans serving each section; provided that as an alternative, at the discretion of the BMA, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy shall at all times be available onboard in an accessible position and in any case plans and booklets shall be kept up to date; any alterations thereto shall be recorded as soon as practicable and the description in such plans and booklets shall be in English.

29.2.1.15 A duplicate set of fire control plans or a booklet containing such plans shall be permanently stored in a prominently marked weathertight enclosure outside the deckhouse for the assistance of shore-side fire-fighting personnel[38].

29.2.1.17 An onboard means of recharging breathing apparatus cylinders used during drills shall be provided or a suitable number of spare cylinders shall be carried onboard to replace those used.

[37] Refer to Graphical symbols for fire control plans, adopted by the IMO by Resolution A.654(16) and Resolution A.952(23) - Graphical Symbols for Shipboard Fire Control Plans for ships constructed on or after 01 January 2004.
[38] Refer to the Guidance concerning the location of fire control plans for assistance of shoreside fire-fighting personnel (MSC/Circ.451).

30 SURVEY, CERTIFICATION AND ACCIDENT INVESTIGATIONS

30.1 General

30.1.1 All vessels covered by this code are required to be surveyed and certificated in accordance with the applicable international conventions and Bahamas legislation (See Section 3).

30.1.2 In particular, an inspection of the outside of the vessel's bottom shall take place at least twice in the five-year validity period of the Certificate of Compliance with not more than 36 months between inspections. Ordinarily at least one of these inspections should be with the vessel out of water, however the BMA will consider applications for in water survey in lieu of dry dock/slipping.

30.1.3 Statutory work may be undertaken by surveyors of the BMA, or surveyors of a Recognised Organisation or Yacht Survey Organisation appointed by the BMA.

30.1.4 A vessel to which the international Conventions apply shall be surveyed and, if the necessary standards are met, Convention certificates or Statements of Compliance shall be issued.

30.1.5 All requests for survey and certification shall be made to the BMA, the Recognised Organisation or the Yacht Survey Organisation, as appropriate.

30.2 Survey and Certification:

30.2.1 All ships covered by this Code are required to be surveyed and certified in accordance with the applicable requirements of the Code.

30.2.2 Compliance with the standards required by this code will entitle a small yacht to be issued with a Bahamas Small Charter Yacht Certificate of Compliance issued by the BMA.

30.2.3 Compliance with the standards required by this Code will entitle yachts to be also issued with the certification required by the international conventions applicable to the vessel, upon satisfactory completion of the corresponding surveys and inspections.

30.2.4 The initial, annual and renewal surveys shall be carried out by the BMA, a Bahamas Recognised Organisation or Yacht Survey Organisation. On satisfactory completion of the surveys the surveyor will issue a short-term Certificate of Compliance valid for 6 months.

30.2.5 The short-term Certificate of Compliance and survey report shall be forwarded to the BMA by the surveyor. The BMA will review the report and issue a full-term Certificate of Compliance on payment of the appropriate fee.

30.2.7 The full-term Certificate of Compliance is valid for five years, subject to an annual survey by the BMA, Recognised Organisation or Yacht Survey Organization within the three-month period before or after the anniversary date.

30.2.8 Small private yachts (SPYs) in voluntary compliance with this Code will be issued with a Bahamas Small Charter Yacht Statement of Compliance, which will have the same validity and survey regime as the Certificate of Compliance.

30.2.9 SPYs on restricted charter shall hold a valid Statement of Compliance and a Private Yacht Restricted Charter Certificate, as per Yacht Notice 07.

30.3 Use of a Recognised Organisation or Yacht Survey Organisation

30.3.1 Statutory work may be undertaken by surveyors of the BMA or by surveyors of a Recognised Organisation[39] or Yacht Survey Organisation[40] appointed by the BMA. All requests for survey and certification shall be made to the BMA or the appropriate Recognised Organisation or Yacht Survey Organisation.

30.3.2 Authorised Recognised Organisations and Yacht Survey Organisations are aware of the extent to which responsibility has been delegated to issue International Convention Certificates. International Conventions give specific discretion to the BMA to either make exemptions or accept equivalent equipment or arrangements. The formal agreement between the BMA and its Recognised Organisations/Yacht Survey Organisations governs the relationship between the two parties.

30.4 Use of a Recognised Organisation Surveyor to act on the behalf of the BMA

30.4.1 An exclusive surveyor from a Recognised Organisation, proposed by them, may be appointed to act on behalf of the BMA in cases when it is impracticable for a surveyor of the BMA to make the visit necessary for the survey.

30.4.2 When a Recognised Organisation surveyor is so appointed, actions taken shall be under direct instruction of the BMA. The BMA shall provide the appointed surveyor with detailed guidance on the scope of survey and report required.

30.5 Accident Investigations

30.5.1 The BMA is obliged to investigate accidents or incidents in which a vessel registered in The Bahamas is involved, in accordance with the requirements of the International Conventions. In addition to this legal requirement, the BMA may investigate any incidents where there may be important safety lessons to be learned[41].

30.5.2 It is an offence for the vessel's master, skipper or owner not to inform the BMA of a reportable accident immediately[42] after it occurs and to provide details so that an

[39] Please refer to Marine Notice 02
[40] Please refer to Yacht Notice 09
[41] Please refer to BMA Information Bulletin No.4
[42] Within 4 hours of occurrence

assessment of its seriousness can be made quickly. The BMA shall appoint a suitable investigator whenever an investigation is required. The BMA will receive the investigator's report of the investigation and shall deal with the follow up action.

30.5.3 The BMA is mandated to conduct an investigation into any very serious marine casualty occurring on any ships to which the IMO Casualty Investigation Code applies[43]. Such an investigation may assist in determining what changes in the content of this Code may be desirable. Casualty investigations are carried out in accordance with the IMO Casualty Investigation Code and Bahamas legislation.

30.5.4 All very serious marine casualties in accordance with the IMO definition are reported to IMO by the BMA

[43] The full title of the Casualty Investigation Code is "Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Incident".

31 LIST OF CERTIFICATES TO BE ISSUED

31.1 General

31.1.1 Every vessel to which this Code applies shall be certificated in accordance with the relevant provisions of the applicable Conventions (as amended). This shall include as a guide, but not necessarily limited to those listed in this Section.

31.1.2 Certificates shown in blue below are issued by the BMA. Other certificates are issued by the BMA or a Recognised Organisation or Yacht Survey Organisation acting on its behalf.

31.2 Certificates to be issued to all vessels

.1 Certificate of Registry
.2 Tonnage Certificate
.3 Bahamas Small Charter Yacht Certificate of Compliance
.4 Certificate of Classification (if applicable)
.5 Load Lines Conditions of Assignment (if applicable)
.6 International Sewage Pollution Prevention Certificate (when more than 15 persons are carried onboard)
.7 Minimum Safe Manning Document (if applicable)
.8 Antifouling Systems, Owners Declaration
.9 EIAPP Certificates / NOx Technical Files (for each engine with a power output of more than 130kW built after 01 January 2000)
.10 Ship Radiocommunications Licence[44]
.11 International Ballast Water Management Certificate/Statement (if applicable)

[44] Issued by BMA on behalf of The Bahamas Utilities Regulation and Competition Authority (URCA)

32 YACHT TYPE SPECIFIC REQUIREMENTS

32.1 Sailing Vessel Features

32.1.1 Efficient storm sails shall be carried which are capable of taking the vessel to windward in heavy weather. Where one of the required storm sails is a foresail, and roller furling gear and associated sails are fitted, a means of setting a separate taut luff storm jib shall be provided. Each storm weather jib shall have a means to attach the luff to a stay independent of any luff groove device, which shall be permanently attached to the sail. Such sails may use the taught luff of a furled sail.

32.1.2 Storm sails need not be provided for a vessel restricted to Area Categories 4, 5 and 6, which restrict operations to favourable weather and daylight.

32.1.3 The condition of spars and rigging shall be periodically examined by a competent person. The frequency of examination will depend on the nature of the rig and its use. As a minimum, a detailed spars and standing rigging visual inspection shall be carried out at least once during the term of the certificate and a report presented to the Survey Organisation. More frequent examinations may be considered necessary, at the discretion of the Survey Organisation. Chain plates and their attachments to hull structure shall be visually examined at least every five years and more frequently if justified by usage.

32.2 Vessels fitted with a Deck Crane or Other Lifting Device

32.2.1 Reference shall be made to Section 11.10 for requirements for safety standards for vessel stability during lifting operations.

32.2.2 Generally, a vessel fitted with a deck crane or other lifting device which will be used when the vessel is at sea shall be a decked vessel with a watertight weather deck in accordance with Section 4.1.1 and 4.3.1.1.

32.2.3 Agreement shall be obtained from the BMA for any proposal to fit a deck crane or other lifting device on a vessel which is not a decked vessel.

32.2.4 The vessel's structure, the crane or other lifting device and the supporting structure shall be of sufficient strength to withstand the loads that will be imposed when operating at its maximum overturning moment and maximum vertical reaction.

32.2.5 Load tests and inspections to verify the safe operation of the crane or other lifting device, its foundation and supporting structures shall be carried out to the satisfaction of the Survey Organisation. Tests shall be conducted in accordance with a recognised standard for the installation. Such tests shall be repeated after modifications, including any structural modifications, take place. A visual inspection of the crane or lifting device shall be carried out annually.

32.2.6 Typically, the crane or other lifting device shall be subjected to a 25% overload test. (In special circumstances a reduced overload may have to be accepted but in no case shall this be less than 10 %.) During the overload test, the hoist, slew and luff performance shall be tested at low speed, as appropriate. Tests for a variable load-radius type of crane or other lifting device shall correspond to its rated performance (e.g. load radius chart).

32.2.7 Attention is drawn to the requirements of BS 7120: Part 2. Paragraph 17 - Cranes on Water Borne Craft, has particular relevance to vessels certificated in accordance with this Code.

32.2.8 An inclinometer (pendulum) shall be provided onboard for guidance to the crane or lifting device operator when controlling the lifting items of unknown weight.

32.2.9 A prominent clear notice shall be posted on or near the crane or lifting device and contain the following information and instructions:

.1 the maximum permitted load and outreach which satisfy the requirements of Section 11.10.3, or the safe working load (SWL), whichever is the lesser (operating performance data, i.e. load radius performance chart for a crane or other lifting device of variable load-radius type shall be included as appropriate);

.2 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 any time. Provision shall be made to enable the driver to ascertain the safe working load corresponding to that radius;

.3 details of all openings leading below deck which shall be secured weathertight; and

.4 instructions for all personnel to be above deck before lifting operations commence.

32.2.9 A lifting system which incorporates counterbalance weight(s) shall be specially considered by the BMA.

32.2.10 The Survey Organisation shall be satisfied that the safety of the vessel is not endangered by lifting operations. Means shall be provided for the efficient securing of cargo and loose equipment onboard during lifting operations. Instructions on safety procedures to be followed by the skipper shall be provided to the satisfaction of the Survey Organisation.

33 NOT USED IN THIS CODE

34 BATTERY SYSTEMS

34.1 Summary

34.1.1 The intent of this Section is to provide guidance on best practice to facilitate safe solutions for vessels utilising batteries used for propulsion and/or vessel electric power supply purposes during ship operations.

34.2 Introduction

34.2.1 This guidance has been developed to identify industry best practice; however, it is recognised that it cannot cover every eventuality in design, installation, operation, etc., and each case shall be considered separately. There are several areas within a design where the use of risk assessments or hazard identification techniques (such as Failure Modes Effects Analysis (FMEA)) shall be performed to understand the potential safety issues for personnel, the environment, the vessel and the vessel's operations.

34.2.2 This guidance does not supersede any other guidance or statutory instruction and shall be taken into account when developing designs for battery power systems. This guidance does not replace the need for sound engineering practice nor seamanlike precautions.

34.3 Definitions

34.3.1 A ***cell*** is a single electrochemical unit in its simplest form, typically packaged in metal cylinders; or flat, rectangular metal or plastic cases ("prismatic cells"); or heat-sealed foil pouches.

34.3.2 A ***battery*** is an assembly of two or more cells that are electrically connected together and fitted in a case with devices as terminals, markings and protective devices that it needs to function properly and safely.

34.3.3 ***Thermal runaway*** is when a cell enters a self-heating state (exothermic reaction) where the heat generated is greater than the heat dissipated. (Note: thermal runaway can begin at temperatures as low as 120°C depending on the cell size, design and chemistry, and from the initiation of thermal runaway, a cell's temperature can rise to a maximum in under 2 minutes.)

34.3.4 ***State of charge*** is the available capacity in a battery expressed as a percentage of rated capacity.

34.3.5 ***State of health*** reflects the general condition of a battery and its ability to deliver the specified performance compared with a new battery.

34.3.6 A ***battery management system (BMS)*** is an electronic device that controls, manages, detects or calculates electric and thermal functions of the battery system and provides communication between the battery system and upper level control systems.

34.4 General Overview

34.4.1 The content of this Section does not cover every eventuality in design, installation, operation, etc, and each case shall be considered separately. The use of risk assessments or hazard identification techniques shall be performed to understand the potential safety issues for personnel, the environment, the vessel and the vessel's operations caused by the incorporation of a battery. Suitable mitigations or safeguards shall be implemented to reduce risks to an acceptable level. In general, amendments to operational methods or procedures will not be accepted as an alternative to the safe design of a battery system and its installation in a vessel, whether this be regarding location, materials, equipment, auxiliaries, construction method, etc.

34.4.2 The design of a battery system within a vessel shall anticipate future changes. These changes might relate to the operational tasking of the vessel, modifications to the electrical equipment, upgrades to the battery cell chemistry (and energy density) or caused by obsolescence of equipment. It shall be highlighted that any modification which changes the requirements upon an existing battery system shall be thoroughly assessed against the original requirements of the battery and its current state of health.

34.5 Battery Installation in a Vessel

34.5.1 This section provides guidance to ensure that the hazards associated with installing and operating a battery on a vessel do not lead to unacceptable risks to persons, the vessel, the environment, or the vessel's operations. SOLAS II-1 Part D Electrical Installations shall take precedence over the following paragraphs however their content should be considered.

34.5.2 The role of the battery shall be clearly defined for its intended use in a vessel; for example, the battery may be a small part of a hybrid system, or it may be the sole source of propulsive power. A risk assessment method such as an FMEA shall be performed to assess the effects of a battery system failure upon the vessel and its operations. These assessments shall consider the vessel's different operating modes and the state of health of the battery through its intended design life.

34.5.3 The vessel shall employ its own electrical protective devices (e.g. fuses or circuit breakers) to protect the battery and personnel but also to prevent damage to ships equipment caused by battery defects. A positive lockable means of isolating the battery shall be provided to allow maintenance.

34.5.4 The location of the battery compartment shall take into account the operational role of the battery (e.g. whether the battery is used for emergency power during an engine room fire) as well as the effects that a battery fire would have on the vessel. Consideration shall be given for avoiding adjacent compartments containing sources of heat or significant fire loads as increases in battery compartment temperature could affect battery operations or lead to thermal runaway. It is expected that further considerations would be necessary for vessel not built of steel or equivalent material. A full assessment shall be made for the

routing of cables and pipework through the battery compartment, and the routing of cables from the battery in order to maintain essential services during an incident.

34.5.5 It is strongly recommended that the temperature of the battery space/compartment is carefully considered for all installations. To ensure that the batteries are kept within their thermal operating limits, temperature control systems like water cooling systems or heating, ventilation and air conditioning (HVAC) systems shall be employed with levels of redundancy to ensure that localised cell temperatures remain within manufacturers guidelines in the most onerous heating condition (e.g. high external atmospheric temperatures with all equipment operating at maximum load). The failure of such temperature control systems shall produce alarms for the battery system. Temperature monitoring of the battery compartment is also recommended, and this may be linked to early warning alarms as well as fixed fire suppression systems.

34.5.6 All ventilation and electrical systems within the battery compartment shall be capable of being isolated from a safe location outside of the battery compartment. Ventilation systems shall safely expel toxic or flammable gases to a safe location.

34.5.7 The battery and battery systems shall be fixed within the battery compartment such that they can endure the maximum predicted vessel motions. Heavy items or items which could cause physical damage to the battery shall not be co-located with the battery unless these are retained within the same parameters. Consideration shall be given to fixing the battery adjacent to any potential heat source which could result in inadvertent heating of the battery, e.g. exhaust, heavily loaded electrical cabling and direct sunlight.

34.5.8 The battery location and fixings shall ensure that standing water and residues are removed from around the battery and firefighting media can adequately penetrate the battery casings to extinguish and/or quench a potential fire.

34.5.9 Consideration shall be given to the reduction of combustible materials within a battery compartment, especially those which produce smoke or toxic products in a fire. For certain types of vessel, the use of combustible materials within the battery compartment may be prohibited. Dangerous goods shall not be stored in a battery compartment.

34.5.10 The boundaries of the battery compartment shall have fire protection to contain a fire in the space of origin and it shall be appropriate for the cumulative fire loads within the compartment and the type of vessel (e.g. an A-60 class division). Penetrations through these boundaries shall be protected to the same fire protection standard. For domestic vessels, the required fire protection may be defined in the applicable vessel regulations.

34.5.11 Early identification of a potential battery fire and automated actions prior to an incident are key to preventing thermal runaway and a possible chain reaction between adjacent cells. The battery compartment shall be fitted with detectors in accordance with manufacturer's recommendations which are capable of providing early identification of a

fire. Possible early identification could involve the monitoring of local cell temperatures or detection of electrolyte solvent vapours. When activated, the detectors shall initiate appropriate alarms and may automatically isolate electrical systems and ventilation or activate fixed fire-fighting systems.

34.5.12 An assessment shall be conducted to identify the most appropriate firefighting equipment and procedures for the types of fire within the battery space/compartment - such an assessment may consider at what point firefighting using portable equipment may no longer be appropriate. Both extinguishment and heat removal are fundamental to fire-fighting efforts and many of the common firefighting media can be utilised once the relevant isolations are made (e.g. electrical or ventilation). It is strongly recommended that one or more fixed firefighting systems are designed and installed so that these can be operated from a safe location with feedback provided to confirm proper activation. In addition, portable fire extinguishers shall be provided to address the potential classes of fire within the battery compartment and the fire loads that they present. For certain vessel types, a fire hydrant, hose and suitable nozzle shall also be available to access all parts of the battery compartment.

34.6 Battery Management System

34.6.1 The battery management system is required to maintain the condition of the cells and battery and protect them from unsafe situations such as internal battery defects, excessive external demands (e.g. a high current demand) and overcharging. It shall be ensured that the battery management system is compatible with the requirements of the battery system, the other battery components and the vessels electrical equipment. The use of risk assessment methods are important to ensure that all of the potential failures in the battery and in the vessel have been appropriately considered with mitigations adopted according to the severity of risk.

34.6.2 Abnormal temperature rise can be considered the first warning of thermal degradation of cells and shall be continuously monitored. Out of tolerance readings shall initiate an automatic response such as shutdown of a group of cells. It is recommended that temperature monitoring is provided at the cell level, especially if the batteries experience high charge or discharge rates. The battery management system may actively manage battery operations with respect to the temperature of the battery to improve efficiencies and to further reduce the risk of high temperature incidents. Due to the importance of temperature on batteries, continuous temperature monitoring may also be linked to responses external to the battery (e.g. isolation of the battery, early warning alarms and fixed fire suppression systems).

34.6.3 The battery management system shall limit currents to ensure the battery remains in a safe condition. Permitted currents may be controlled relative to the state of charge and shall take account of the battery's state of health through-life.

34.6.4 Lithium-ion cells, unlike other conventional battery technologies, shall not be charged in excess of 100% state of charge as this may cause rapid failure of the electrodes and possible thermal runaway. Discharging below the minimum safe voltage can also cause cell damage. Unlike other battery technologies, it is therefore not possible to balance the state of charge of several lithium-ion cells using top-off or trickle charging of the battery, and it is vital that charging is stopped immediately if there is an unacceptable temperature rise - battery management systems shall only be employed if they are compatible with lithium ion batteries and are suitable for the application.

34.6.5 The battery management system shall be capable of monitoring cell voltages and currents to a high resolution in order to ensure that the voltage of each cell remains within the range specified by the manufacturer. Cell voltages shall be continuously monitored with an automatic alarm if these voltages exceed or fall below set limits, and a cell or battery shutdown shall occur automatically if any voltage approaches the cell damage threshold.

34.7 Battery Operations and Procedures

34.7.1 Labels and signs - batteries, high voltage equipment, battery systems and compartments shall be adequately labelled using internationally agreed symbols where available. Emergency systems shall be appropriately labelled and be clearly visible.

34.7.2 Logbooks and configuration - it is recommended that a battery logbook is held onboard to record the status of the battery and its equipment. The logbook may include equipment serial numbers and dates of manufacture/installation/testing/expiry, maintenance records, test results, defects, a summary of the battery charge/discharge cycles, etc. Software used for control, monitoring, data logging, alarm and safety systems, which may be part of the battery management system, shall be developed using robust and auditable processes. All software within such systems shall be version controlled and recorded.

34.7.3 Operational procedures – it shall be ensured that the battery system is never operated outside of its designed scope of assumptions and limitations. Therefore, although a battery system shall contain many cascading levels of protective devices, the vessel shall not employ operational procedures that rely on these protective devices for a safe condition.

34.7.4 For vessels utilising electrical power from the battery system for propulsive power or dynamic positioning, operational procedures are considered of prime importance to protect the battery system whilst ensuring that loss of a battery system does not affect the safety of the vessel or its operations. Formal operating procedures shall be developed for the operating scenarios expected of the battery; considerations might include failure scenarios (e.g. loss of a cooling system) to ensure that the battery is not inadvertently operated outside of safe parameters – it is expected that consideration of such scenarios may lead to further safety mitigations in the design of the battery system.

34.7.5 Inspections and maintenance – all inspections and maintenance shall be in accordance with manufacturer's recommendations but shall include the testing of all sensors, assessment of the state of health of each cell, recording of the environmental conditions in the battery compartment and assessment of any other relevant factors. Routine inspections may check for physical damage, cleanliness, signs of arcing or increased temperature, correct operation of ventilation and battery protection systems, etc. Maintenance activities shall be planned in a vessel's maintenance schedule. Procedures shall be held onboard to detail the necessary actions if the battery is at risk of being operated outside of its normal operating envelope (e.g. during extended refit periods, following limited charge periods or following identification of a defect).

34.7.6 Emergency procedures shall be developed for the actions to be taken in all likely emergency scenarios; these may require consultation with an independent body such as a Recognised Organisation. Scenarios may include a battery localised high temperature, activation of a fire detection device, identification of a fire in the battery compartment (a battery fire or another combustible), a medical incident, flooding, violent cell venting, etc. Emergency procedures shall be held on board and shall include actions to be taken by all stakeholders, including emergency services and salvage teams, to create a safe condition. Emergency drills and training shall be routinely conducted for all of the main emergency scenarios.

34.7.7 An assessment shall be made of the possible medical scenarios related to the battery and suitable mitigations shall be actioned whether these be pre-emptive (e.g. provision of personal protective equipment) or remedial (e.g. installation of an eyewash station).

34.7.8 Crew Training - it is recommended that at no time shall there be less than two persons on the vessel who are adequately trained and experienced in all battery equipment and procedures. In addition, all crew shall have an awareness of the vessel's emergency procedures regarding the batteries.

34.8 Further Information

- UK MGN 550 (M+F) Electrical Installations - Guidance for Safe Design, Installation and Operation of Lithium-ion Batteries
- IEC 62281 Safety of primary and secondary lithium cells and batteries during transport
- IEC 62619 Safety requirements for secondary lithium cells and batteries for use in industrial applications
- IEC 62620 Secondary lithium cells and batteries for use in industrial applications
- IEC 60529 - Specification for classification of degrees of protection provided by enclosures
- UN DOT 38.3 Recommendations on the transport of dangerous goods, manual of tests and criteria

35 OVER SIDE WORKING

35.1 Introduction

35.1.1 The use of Over-side Working Systems is common on vessels, especially commercial yachts. Such installations allow crew members to work outside conventional guardrails for cleaning and maintenance purposes.

35.1.2 Most over-side working systems consist of one or a combination of the following:

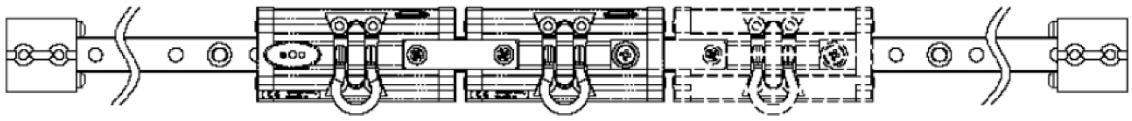
.1 "Rail and car" or "rail and trolley" systems comprising of two travellers, cars or trolleys linked in tandem that can be separated, if necessary, into independent units. These cars are fitted to a metal rail which allows them to glide along it and to which support harnesses are attached.

.2 Harnesses, lanyards, fall arresters, energy absorber and similar devices.

.3 Single anchoring points, pad eyes and eye bolts

35.1.3 Traditionally many of the early "rail and car" systems were designed for the sole purpose of sail handling and not for supporting crew members working over the side of the yacht. Equipment which is used for supporting persons shall be designed for that purpose and it is not acceptable to use a "rail and car" system designed solely for sail handling for the purpose of supporting crew members working over the yacht's side.

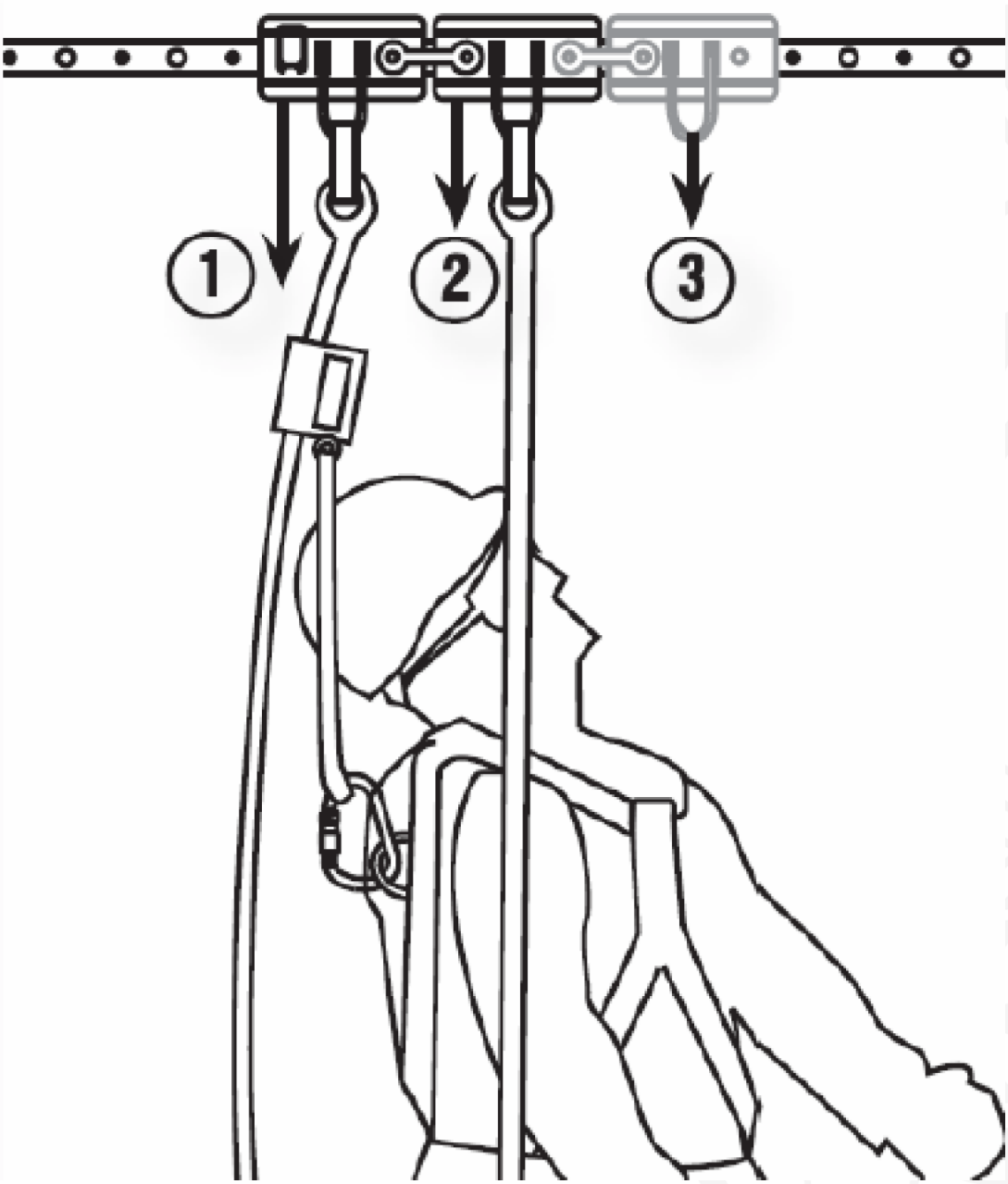
35.1.4 Below is an example of a "rail and car" system showing its construction.



Lanyard Attachment Points

End stop | Tandem Car | (Optional Equipment Car & Connector Plate) | Track Rail

35.1.5 Below is a typical set up for the attachments to the traveller cars.



1. Full-body safety harness
2. Working harness
3. Additional options, such as supporting a tool service car

35.2 Installation

35.2.1 Over-side working systems shall have their fixed components tested, certified and approved to a recognised standard for fall protection equipment[45].

35.2.2 If it cannot be confirmed that the design of the attachment to the substrate is identical to that used in the type approval process completed by the over-side working system's manufacturer, or through approval of the design on another vessel, separate pre-installation testing is required to be satisfactorily completed prior to the system being installed.

35.2.3 In addition to the over-side working systems requiring type approval, the installation of the system to the substrate of the yacht shall be tested to meet the requirements of a recognised standard, such as BS EN 795.

35.2.4 Yacht substrates can be of many differing thicknesses and materials, as can the fixtures and fittings that secure the over-side working systems to the substrate. In all cases the method of installation to the particular substrate shall be tested in accordance with a recognised standard, such as BS EN 795, in order to be considered approved and suitable for supporting crew members working over the yacht's side. If a particular method of attachment of the over-side working systems to the yacht's substrate has been previously approved and documentary evidence can be provided, only post-installation testing shall be required.

35.2.5 Trackway orientation to be within manufacturer's approval certificate considering the path of the harness line and resultant wear.

35.3 Pre-installation testing

35.3.1 When the method of attachment to the substrate has not been approved, additional static and dynamic load tests shall be required to prove the strength of the individual installation for each type of base material/fastener type. These tests effectively 'type approve' the method of attachment to the underlying structure. It is recommended that such testing is carried out in a workshop on a section of track of at least 400 millimetres in length attached to a representative mock-up of the vessel's superstructure. Tests shall be witnessed by a Recognised Organisation and if successfully carried out, suitably endorsed records shall be retained.

35.3.2 The specifications for such tests are as follows:

.1 Static load test – this requires the application of a 12kN load in at least 3 locations, typically at both ends and at any rail joint or in the middle. This load shall be applied for 3 minutes.

[45] For example, BS EN 795: 1997, Class D

.2 Dynamic load test – this requires the use of a test lanyard manufactured from rope conforming to a recognised standard, such as BS EN 892, with a 100kg solid test mass dropped through a predetermined distance in order to apply a fall arrest load of 9kN. Direct reference should be made to BS EN 795:2012 as to how this shall be achieved.

.3 Following the dynamic load test, the car(s) and section of track used for testing shall have been overloaded and shall be discarded.

35.4 Post-installation testing

35.4.1 As with all lifting appliances, once the device has been installed onto the yacht a post-installation load test shall be carried out before the system is taken into use.

35.4.2 Testing post-installation shall be completed as follows:

.1 A test load of 6kN shall be attached to a single car or single anchor point for at least 15 seconds in at least 3 locations, typically at both ends and at any rail joint or in the middle.

.2 Such testing shall be carried out along with any additional requirements specified by the system manufacturer.

.3 This testing shall be witnessed by an approved surveyor and recorded on a suitable load test certificate which is duly endorsed by the witnessing parties.

35.5 5 yearly testing

35.5.1 The post-installation test shall be carried out at 5 yearly intervals and also at intervals prescribed by the manufacturer.

35.6 Non-compliant and pre-existing systems

35.6.1 Yachts fitted with uncertified over-side working systems, shall have the systems decommissioned, unless retrospective certification can be obtained.

35.6.2 In yachts fitted with over-side working systems or which there is evidence that the system is in compliance with a recognised standard but without evidence that the installation was tested by an approved surveyor, the following applies:

.1 The system shall not be used until such time as the installation arrangements have been approved by an approved surveyor. This may require the submission of drawings of the existing attachment arrangements and the subsequent conducting of static and dynamic testing of the rail attachment method as deemed applicable.

.2 On satisfactory completion of this testing the over-side working systems shall be subject to the equivalent of the post-installation testing as defined previously in section 35.4.

35.6.3 In yachts fitted with over-side working systems for which there is evidence that the system is in compliance with a recognised standard and there is evidence that the

installation was approved but there is no evidence of post-installation testing, the following applies:

.1 The over-side working systems shall be subject to post-installation testing as defined previously in section 35.4.

35.6.4 In the case of section 35.6.1 – 35.6.3, prior to the completion of the required load testing, signage shall be clearly displayed stating the track is not to be used unless the crew member has a fall arrester attached by a secondary line which is secured to a strong point suitably tested to take the full load for fall arrest or around an item of yacht structure substantial enough to withstand the drop loads.

35.7 Operation

35.7.1 Before use the Owner or Company shall ensure that:

.1 the manufacturers' instructions are read and understood by the persons who will be using the equipment;

.2 a risk assessment is carried out and an appropriate rescue plan developed to recover persons who fall into the water; and

.3 crew members are competent to use the equipment and are aware of any conditions relating to its use and their safety.

35.7.2 Over-side working systems shall not be used whilst the vessel is underway.

35.7.3 These systems are designed to be used with the appropriate PPE (harnesses, lanyards, fall arresters, lifejackets and other devices).

35.7.4 On systems where one of the travellers is fitted with a locking device, the device which locks the traveller in position along the track rail shall ONLY be disengaged from the track rail while the user is changing position. Once the user is in position, the locking device shall be re-engaged to hold the car in position and limit the user's movement along the track rail.

35.7.5 The user shall NEVER rely on only one attachment point for personal protective equipment. The working harness shall be attached to one traveller and a fall arrestor, or other safety device, to the other. A third traveller could be used to attach work tools.

35.7.6 Over-side working should be subject to a permit to work.

35.8 Additional notes

35.8.1 Where any over-side working systems has been subject to a dynamic loading equivalent to fall arrest, the system shall be retired from service and subject to a full review by a representative of the manufacturer to confirm the system remains fit for continued use.

35.8.2 All over-side working systems shall be marked for the use of one user only.

35.8.3 The attachment of the safety harness to the car shall be in accordance with the manufacturer's instructions, which shall include an energy absorber certified for compliance with a recognised standard, such as BS EN 355.

35.8.4 Regardless of whether the system shall be used for restraint or fall arrest, the more onerous test requirements shall be met.

35.8.5 Documentation retained onboard shall be as indicated in Annex A of BS EN 795:2012 or equivalent and shall include as a minimum:

.1 approved plans;

.2 certificates of load test for installation; and

.3 post-installation and periodical testing.

35.9 Further Information

- BS EN 795:2012 Personal fall protection equipment – Anchor devices (It shall be noted that the original BS EN 795 standard has been replaced by BS EN 795: 2012);
- BS EN 795:1997 Protection against falls from a height. Anchor devices. Requirements and testing;
- BS EN 355:2002 Personal protective equipment against falls from a height. Energy absorbers; and
- BS EN 892:2012 Mountaineering equipment. Dynamic mountaineering ropes. Safety requirements and test methods.

36 NOT USED IN THIS CODE

37 LPG INSTALLATIONS

37.1 General Information

37.1.1 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.

37.1.2 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.

37.1.3 Consequently, the siting of gas consuming appliances and storage containers and the provision of adequate ventilation to space containing them is most important.

37.1.4 It is dangerous to sleep in spaces where gas-consuming open-flame appliances are left burning, because of the risk of carbon monoxide poisoning.

37.1.5 LPG is heavier 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.

37.1.6 A frequent cause of accidents involving LPG installations is the use of unsuitable fittings and improvised “temporary” repairs.

37.2 Stowage of Gas Cylinders

37.2.1 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 vessels interior and fitted with a vent and drain, so that gas which may leak can disperse overboard.

37.2.2 The vent and drain shall not be less than 19 mm in diameter, run to the outside of the craft and terminate 75 mm or more above the ‘at rest’ waterline. The drain and locker ventilation shall be 500 mm or more from any opening to the vessels interior.

D2.3 The cylinders and associated fittings shall be positively secured against movement and protected from damage in any foreseeable event.

D2.4 Any electrical equipment located in cylinder lockers shall be certified safe for use in the potential explosive atmosphere.

37.3 Cylinders and Attachments

37.3.1 Each system shall be fitted with a readily accessible, manually operated isolating valve in the supply pressure part of the system.

37.3.2 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.

37.3.3 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.

37.3.4 Containers not in use or not being fitted into an installation shall have the protecting cap in place over the container valve.

37.4 Fittings and Pipework

37.4.1 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.

37.4.2 Connection between rigid pipe sections shall be made with hard solder (minimum melting point 450°C), appropriate compression or screwed fittings are recommended for general use for pipework in LPG installations.

37.4.3 Where a flexible hose is used length shall be kept to a minimum, it shall be protected from inadvertent damage where appropriate, it shall meet the requirement of BS EN 1763 or equivalent and be installed in a manner that gives access for inspection along its whole length.

37.4.4 There shall be no joints in the pipework in the engine spaces.

37.5 Appliances

37.5.1 All unattended appliances shall be of the room sealed type.

37.5.2 Cookers and hobs are not considered to be unattended appliances.

37.5.3 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.

37.6 Ventilation

37.6.1 The ventilation requirements of a space containing an LPG appliance shall be assessed against an appropriate standard, e.g. Annex B of ISO 10239, and shall take into account gas burning equipment and persons occupying that space.

37.6.2 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.

37.7 Gas Detection

37.7.1 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.

37.7.2 Gas detectors heads shall be securely fixed in the lower part of the compartment in the vicinity of the gas-consuming appliance and other space(s) into which gas may seep. In areas where the detector head is susceptible to damage in the lowest part of the compartment (e.g. engine space bilge) the detector head shall at least be fitted below the lowest point of ignition.

37.7.3 A gas detector system of a suitable type shall, preferably, be actuated promptly and automatically by the presence of a gas concentration in air of not greater than 0.5 per cent (representing approximately 25 per cent of the lower explosive limit). The detection system shall incorporate a visible and audible alarm, which can be heard in the space concerned and the control position with the vessel in operation.

37.7.4 Gas detection system components (i.e. gas detector head) likely to be in an explosive air/gas atmosphere shall not be capable of igniting that atmosphere.

37.7.5 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.

37.7.6 The detection equipment shall be maintained in accordance with the manufacturer's requirements.

37.8 Emergency Action

37.8.1 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 (i.e. the gas leakage has been eliminated and the spaces fully ventilated)

.3 WARNING: NAKED LIGHTS SHALL NEVER BE USED AS A MEANS OF LOCATING GAS LEAKS.

37.9 Owner/Operator Testing

37.9.1 It is strongly recommended that LPG systems are tested for leakage regularly.

37.9.2 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

37.9.3 If leakage is present, close the cylinder valve and have the system repaired before further use.

REVISION HISTORY

Section	Description of Revision
All	First Issue