The Bahamas Maritime Authority

The Bahamas Large Charter Yacht Code

Version 2.0

bahamasmaritime.com

CONTENTS

FOREWORD

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

This Code ("the Code" or "BLYC") is based upon and provides for an equivalent level of safety to the Large Commercial Yacht Code that was developed jointly by the UK Red Ensign Group. The Bahamas Maritime Authority wishes to acknowledge and thank the UK Red Ensign Group for their permission to base this Code upon the Red Ensign Group Yacht Code and their cooperation in formulating this Code.

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 commercial or 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 Large Charter Yachts which are 24 metres and above in load line length[1], in commercial use for sport or pleasure, do not carry cargo and do not carry more than 12 passengers.

It is recommended that Large Private Yachts comply with the standards of the Code as if they were Charter Yachts.

Yachts carrying more than 12 but not more than 36 passengers shall comply with the Bahamas Passenger Yacht Code (BPYC).

This Code is an equivalence under the provisions of Article 8 of the International Convention on Load Lines, 1966, Regulations I-5 of the International Convention on Safety of Life at Sea, and Article 9 of the International Convention on Standards of Training Certification and Watchkeeping for Seafarers 1978, as amended. Notification of equivalences can be found on the IMO Global Integrated Shipping Information System (GISIS) at https://gisis.imo.org (registration required).

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

[1] or, if built before 21 July 1968, 150 gross tons and over according to the tonnage measurement regulations applying at that date

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.

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 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 should 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 “BLYC Change Request”.

1 APPLICATION AND INTERPRETATION

1.1 Purpose

1.1.1 The purpose of The Bahamas Yacht Code ("the Code"), is to provide design criteria, construction standards and other safety measures for yachts carrying not more than 12 passengers so as to minimise the risk to such yachts, persons onboard and the environment.

1.1.2 The criteria are largely aligned to the Conventions and Instruments referred to in the foreword to the Code, but have been modified to create an equivalence where deemed appropriate to ensure their suitability for application to yachts

1.2 Application

1.2.1 The Code specifically applies to a motor or sailing vessel of 24 metres in load line length and above (if built before 21 July 1968, which is of 150GT[2] and above) 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.

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

[2] GT means gross tons, measured in accordance with the International Tonnage Convention 1968

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 unrestricted geographical operation outside Polar Regions, however, where considered appropriate, standards for vessels operating as Short Range Yachts have been included.

1.5.2 Vessels which intent to operate in Polar Regions shall meet the requirements of this Code, the IMO Polar Code and those of a Recognised Organisation appropriate to the intended area of operation.

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 within an agreed time scale not exceeding 18 months.

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.

1.6.3 Vessels, the keels of which were laid or were at a similar stage of construction before 01 January 2021 and which have been or are currently under survey to BYC Version 1, may continue to be considered under the standards in force at the time of initial survey with the exception of the following which shall comply with this edition of the Code by the first annual survey after 01 January 2021:

.1 Section 13.5 for Lifejackets;
.2 Section 13.14 for Recovery of persons from the water;
.3 Section 14.10.4.9 for Materials;
.4 Section 15.7.4 for CO2 fire extinguishing systems
.5 Section 15.8 for Firefighter’s communications;
.6 Section 16.8 for Availability of radio equipment;
.7 Section 17.3 vessels of 300GT and above have LRIT fitted;
.8 Section 17.4 vessels of 150GT and above have BNWAS fitted;
.9 Section 18.1 for Nautical publications;
.10 Section 18.7 for Portable atmosphere testing instruments;
.11 Section 22 for Protection of personnel;

.12 Section 24 Part A for vessels under 500GT, Safety Management;
.13 Section 25 for International ship and port facility Code;
.14 Section 26 for Manning, certification and hours of work;
.15 Section 27 for Medical care and carriage of medical stores;
.16 Section 28 for Operational readiness, maintenance and inspections;
.17 Section 29 for emergency training and drills;
.18 Section 30 for Survey, certification and accident investigation;
.19 Section 31 for List of certificates to be issued.

1.6.4. Existing sailing yachts may take advantage of the definition of a 'Short Range Yacht' in this version of the Code; and

1.6.5. Vessels the keels of which were laid or were at a similar stage of construction on or after 01 January 2021, shall comply with this edition of the Code in its entirety.

1.7 Interpretation

1.7.1 Where a question of interpretation of any part of this Code arises which cannot be resolved by a delegated authority and the Company (or for vessels under 500GT, the owner(s)/managing agent(s)) for a vessel, a decision on the interpretation may be obtained on written application to the BMA.

1.8 Equivalent Arrangements

1.8.1 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.

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

.1 is based on the underlying Convention requirements;
.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 and the objectives of the section;
.4 incorporates any specific requirements in the Section'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. Alternative Design and Arrangements

1.9.1. Purpose

1.9.1.1. The purpose of this Section is to provide a methodology for alternative design and arrangements which are limited by the extent to which International Conventions allow. Only sections containing provisions for Alternative Design and Arrangements may utilise such provisions outlined in this Section.

1.9.2. General

1.9.2.1. Design and arrangements may deviate from the requirements of this Code, provided that the alternative design and arrangements meet the intent of the requirements concerned, the Section's objectives and functional requirements where provided, and provide an equivalent level of safety to the Section concerned. Alternative design and arrangements shall be based on the underlying Convention requirements and follow the BMA's alternative design and arrangement procedures.

1.9.2.2. When alternative design or arrangements deviate from the prescriptive requirements of this Code, an engineering analysis, evaluation and approval of the design and arrangements shall be carried out in accordance with this Section.

1.9.3. Engineering analysis

1.9.3.1. The engineering analysis shall be prepared and submitted to the BMA, based on the guidelines[3] and shall include, as a minimum, the following elements:

.1 determination of the ship type, machinery, electrical installations and space(s) concerned;

.2 identification of the prescriptive requirement(s) with which the machinery and electrical installations will not comply;

.3 identification of the reason the proposed design will not meet the prescriptive requirements supported by compliance with other recognized engineering or industry standards;

.4 determination of the performance criteria for the ship, machinery, electrical installation or the space(s) concerned addressed by the relevant prescriptive requirement(s):

i. performance criteria shall provide a level of safety not inferior to the relevant prescriptive requirements contained in SOLAS; and

ii. performance criteria shall be quantifiable and measurable;

[3] Refer to the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III (MSC.1/Circ.1212) and SOLAS Chapters II-2 (MSC.1/Circ.1002).

.5 detailed description of the alternative design and arrangements, including a list of the assumptions used in the design and any proposed operational restrictions or conditions;

.6 technical justification demonstrating that the alternative design and arrangements meet the safety performance criteria; and

.7 risk assessment based on identification of the potential faults and hazards associated with the proposal.

1.9.4. *Evaluation of the alternative design and arrangements*

1.9.4.1. The engineering analysis required in Section 1.9.3 shall be evaluated and approved by the BMA, taking into account the guidelines.

1.9.4.2. A copy of the documentation, as approved by the BMA, indicating that the alternative design and arrangements comply with this Section, shall be carried onboard the ship.

1.9.5. *Exchange of information*

1.9.5.1. The BMA shall communicate to the IMO pertinent information concerning alternative design and arrangements approved by them for circulation to all Contracting Governments.

1.9.6. *Re-evaluation due to change of conditions*

1.9.6.1. If the assumptions and operational restrictions that were stipulated in the alternative design and arrangements are changed, the engineering analysis shall be carried out under the changed condition and shall be approved by the BMA.

1.10. Exemptions

1.10.1. Exemptions shall be granted only by the BMA.

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

1.10.3. 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.

1.11 Vessel Coded under similar Codes

1.11.1 Vessels coded under similar Codes that have been notified to the IMO may be considered under the standards in force at the time of initial certification. However, for vessels less than 500 GT, compliance with section 24 Part A (Safety Management) shall be in place.

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 should 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 Yacht Survey Organisation that has been delegated the responsibilities
"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)
"Aiming Circle"	(for helicopter operations - touchdown/positioning marking) means the aiming point for a normal landing, so designed that the pilot's seat can be placed directly above it in any direction with assured main and tail rotor clearances
"Annual Inspection"	means an inspection conducted on behalf of the BMA by an Authorised Surveyor to verify compliance with this Code. On completion of the inspection a Bahamas Charter 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 surveyor"	means a surveyor who by reason of professional qualifications, practical experience and expertise is authorised by the BMA to carry out the survey required for the vessel
"Aviation fuel" (also known as "Jet A1 Fuel" and "Kerosene")	means a fuel for modern jet and turboprop engines. It consists primarily of hydrocarbon compounds, but other additives are present to increase safety. International regulations stipulate uniform standards for the quality and composition of kerosene

"Aviation Inspection Body (AIB)"	means a body delegated the responsibility of inspecting helicopter landing areas by the BMA. The verification process will include inspection, certification and, where necessary, the application of appropriate operational limitations. Such Bodies will be recognised as having the necessary competencies by a Bahamas Recognised Organisation or directly by the BMA
""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
"Breadth" or "B"	means the maximum breath of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material, unless expressly provided otherwise
"Bulkhead deck"	means the uppermost deck up to which the transverse watertight bulkheads are carried

"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
"Buoyant lifeline"	means a line complying with the requirements of the IMO International Life-Saving Appliances Code
"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
"Central control station"	means a control station in which the following control and indicator functions are centralised – 1. fixed fire detection and fire alarm systems; 2. automatic sprinkler, fire detection and fire alarm systems; 3. fire door indicator panels; 4. fire door closure; 5. watertight door indicator panels; 6. watertight door closures; 7. ventilation fans; 8. general/fire alarms; 9. communication systems including telephones; and 10. microphones to public address systems.
"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 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

"Continuously manned central control station"	means a central control station which is continuously manned by a responsible member of the crew
"COLREGs"	means the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREG 72), as applicable for vessels the keels of which are laid on or after 01 January 2021
"Control stations"	means those spaces in which the ship's radio or main navigating equipment or the emergency source of power is located or where the fire recording or fire control equipment is centralised. Spaces where the fire recording or fire control equipment is centralised are also considered to be a fire control station
"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
"D-value"	means the largest overall dimension of a helicopter when rotors are turning. This dimension will normally be measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane (or the most rearward extension of the fuselage in the case of Fenestron or Notar tails)
"D-circle"	means a circle, usually imaginary unless a helicopter landing area itself is circular, the diameter of which is the D-Value of the largest helicopter the landing area is intended to serve. This will not be the case for landing areas of less than 1D width. For landing areas of less than 1D width, the edges of the imaginary D circle, may extend beyond the edge of the load bearing area by up to 0.085D on either side at the mid-point
"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

"Design pressure"	means the hydrostatic pressure for which each structure or appliance assumed watertight in the intact and damage stability calculations is designed to withstand
"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
"Embarkation ladder"	means the ladder provided at survival craft embarkation stations to permit safe access to survival craft after launching, complying with the requirements of the LSA Code
"Embarkation station"	means the place from which a survival craft is boarded. An embarkation station may also serve as a muster station, provided there is sufficient room, and the muster station activities can safely take place there
"Engaged in trade"	means, for the purposes of the Code, the carriage of passengers for reward or remuneration under a charter or hire agreement
"Emergency source of electrical power"	Means: .1 for vessels less than 500GT, a source of electrical power intended to supply the emergency switchboard in the event of failure of the supply from the main source of electrical power; .2 for all other vessels, the emergency source of electrical power required by SOLAS II-1/42.
"Emergency switchboard"	means a switchboard which in the event of failure of the main electrical power supply system is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services

"Engaged in trade"	Means, for the purposes of the Code, the carriage of passengers for reward or remuneration under a charter or hire agreement
"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 either Resolution A.810(19) or 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 before 01 January 2021
"Fire damper"	means a device installed in a ventilation duct, which under normal conditions remains open allowing flow in the duct, and is closed during a fire, preventing the flow in the duct to restrict the passage of fire. In using the above definition, the following terms may be associated: .1 "automatic fire damper" is a fire damper that closes independently in response to exposure to fire products; .2 "manual fire damper" is a fire damper that is intended to be opened or closed by the crew by hand at the damper itself; and .3 "remotely operated fire damper" is a fire damper that is closed by the crew through a control located at a distance away from the controlled damper
"Fire Safety Systems Code"	means the International Code for Fire Safety Systems as adopted by the Maritime Safety Committee of the IMO by resolution MSC.98 (73), as may be amended by the IMO, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the Annex to the Convention other than Chapter I thereof

"Fire Test Procedures Code"	means the International Code for Application of Fire Test Procedures as adopted by the Maritime Safety Committee of the IMO by resolution MSC.61(67), as may be amended by the IMO
"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
"Float free launching"	means that method of launching a liferaft whereby the liferaft is automatically released from a sinking ship and is ready for use, complying with the LSA Code
"FOD"	Means foreign object debris
"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"	has the meaning given in Annex I of ICLL. The freeboard assigned is the distance measured vertically downwards amidships from the upper edge of the deck line to the upper edge of the related load line
"Freeboard deck"	Means, subject to paragraphs .1 to .4 below, 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

"Garage spaces"	means those enclosed spaces above and below the bulkhead deck used for the storage of pleasure craft, vehicles, jet skis or any other such engine driven units and recreational dive systems
"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
"General emergency alarm system"	means the general emergency alarm system complying with the requirements of paragraph 7.2.1 of the LSA Code
"Glazed opening"	means an opening in the hull, superstructure or deckhouse of a ship structure fitted with a transparent or translucent material
"Hazardous area"	means those areas which may contain flammable or explosive gases, dusts or vapours, the use without proper consideration of machinery or electrical equipment may lead to fire hazard or explosion
"Helideck" or "Helicopter Landing Area"	means a purpose-built helicopter landing area located on a ship including all structure, fire-fighting appliances and other equipment necessary for the safe operation of helicopters
"Helicopter Landing Area Certificate (HLAC)"	means a certificate issued by an AIB to confirm the helideck and associated facilities meet the minimum requirements of the Code

"Helicopter Landing Area Technical Certificate (HLATC)"	means a certificate issued by an AIB to confirm the helideck and associated facilities meet the minimum physical characteristics required in accordance with the Code
"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
"ICAO"	means the International Civil Aviation Organization
"ICLL"	means the International Convention on Load Lines, 1966, as amended, as applicable for vessels the keels of which are laid on or after 01 January 2020
"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
"Intact Stability Code, 2008"	means the International Code on Intact Stability, 2008 (2008 IS Code) As adopted by IMO Circular MSC.267(85). This revised Code includes a mandatory Part A and a recommendatory Part B. Also included in Part A are Severe Wind and Weather Rolling Criteria
"Instructions for onboard maintenance"	means the instructions complying with the requirements of SOLAS III/Part B – Life Saving Appliances and Arrangements, Regulation 36

"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
"L1"	a virtual line drawn at a height of 2.5% of the breadth (B), or 500 mm, whichever is the greatest distance, above the design waterline
"L2"	a virtual line drawn at a height of h_{std} + 0.02L above the design waterline where 0.02L need not exceed 3m
"L3"	a virtual line drawn at a height of 2 x h_{std} + 0.02L above the design waterline where 0.02L need not exceed 3m
"Level 1"	The area between 'L1' and 'L2'
"Level 2"	The area between 'L2' and 'L3'
"Landing area"	means the generic term referring to any area primarily intended for the landing or take-off of aircraft
"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"	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

"Lightest seagoing condition"	means the loading condition with the ship on even keel, with 10% stores and fuel remaining and with the full number of passengers and crew and their luggage
"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
"Line throwing appliance"	means an appliance complying with the requirements of the LSA Code
"LOS"	means Limited Obstacle Sector. This is the 150° sector within which obstacles may be permitted, provided the height of the obstacles is limited
"Low flashpoint fuel"	means gaseous or liquid fuel having a flashpoint lower than otherwise permitted under SOLAS II-2/4.2.1.1
"Low flame spread"	means that the surface thus described will adequately restrict the spread of flame, this being determined in accordance with the Fire Test Procedures Code
"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 rooms"	means spaces between the watertight boundaries of a room containing the main and auxiliary propulsion machinery, including boilers, generators and electric motors primarily intended for propulsion; provided that in

	the case of unusual arrangements, the BMA may define the limits of the machinery rooms
"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.
"Main source of electrical power"	means a source intended to supply electrical power to the main switchboard for distribution to all services necessary for maintaining the ship in normal operation and habitable condition
"Main switchboard"	means a switchboard which is directly supplied by the main source of electrical power and is intended to distribute electrical energy to the ship's services
"Main vertical zone"	means those sections into which the hull, superstructure and deckhouses are divided by "A" class divisions, the mean length of which on any deck does not normally exceed 40 metres
"Major conversion"	means a conversion of a vessel: .1 that substantially alters the dimensions of a vessel; .2 which changes the type of the vessel; .3 the intent of which in the opinion of the BMA is substantially to prolong its life; .4 which otherwise so alters the ship that, if it were a new vessel, it would become subject to relevant

	provisions of the present Code not applicable to it as an existing vessel
"Man-riding"	means the use of a crane, lifting appliance or launching appliance with persons within the tender, rescue boat or other vehicle or platform during launch or recovery
"Margin line"	is a line drawn at least 76 millimetres below the upper surface of the bulkhead deck at side
"Marine evacuation system"	means an appliance complying with the requirements of the LSA Code, for the rapid transfer of persons from the embarkation deck of a ship to a floating survival craft
"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
"Mid-length"	means the mid-point of the subdivision length of the ship
"Mile"	means a nautical mile of 1852 metres
"MLC"	means the International Labour Organisation's 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
"Muster station"	means an area where passengers and crew can be gathered in the event of an emergency, given instructions and prepared to abandon the craft, if necessary
"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 01 January 2021
"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
"OFS"	means the Obstacle-Free Sector. This is a 210° sector, extending outwards to a distance that will allow for an unobstructed departure path appropriate to the helicopter that the landing area is intended to serve, within which no obstacles above helideck level are permitted
"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
"Over-side working systems"	means the securing, anchoring or track and rail systems used to access external portions of the vessel for maintenance and wash down. This can include but not limited to track and car systems or static harness points
"Partial subdivision draft" or "(dp)"	means the light service draft plus 60% of the difference between the light service draft and the Design Waterline draft
"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

"Position 1"	means upon freeboard decks and raised quarterdecks, or other exposed decks[4] lower than one standard height of superstructure above the freeboard deck, and upon exposed decks situated forward of a point located a quarter of the ship's length from the forward perpendicular that are located lower than two standard heights of superstructure above the freeboard deck
"Position 2"	means upon exposed decks situated abaft a quarter of the ship's length from the forward perpendicular and located at least one standard height of superstructure above the freeboard deck and lower than two standard heights of superstructure above the freeboard deck. Upon exposed decks situated forward of a point located a quarter of the ship's length from the forward perpendicular and located at least two standard heights of superstructure above the freeboard deck and lower than three standard heights of superstructure above the freeboard deck
"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)
"Prescribed international voyage"	means an international voyage during the course of which a ship is not more than 200 nautical miles from a port or place in which the passengers and crew could be placed in safety and within a geographical area which limits the length of the voyage to a maximum of 1,000 nautical miles from the initial point of departure, as specified in any Certificate issued in accordance with the Code with respect to the ship
"Prescriptive requirements"	means the 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 hire, not engaged in trade or commerce or chartered, and being used solely for pleasure or recreational purposes of its

4 "Exposed decks" include top decks of superstructures, deckhouses, companionways and other similar deck structures

	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
"Radar transponder"	means a radar transponder for use in survival craft to facilitate location of survival craft in search and rescue operations
"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 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
"Recovery time for a rescue boat"	means the time required to raise the boat to a position where persons onboard can disembark to the deck of the ship and includes the time required to make preparations for recovery onboard the rescue boat such as passing and securing a painter, connecting the rescue boat to the launching appliance, and the time to raise the rescue boat provided that recovery time does not include the time needed to lower the launching appliance into position to recover the rescue boat

"Recreational diving system"	means any system or equipment using, creating or storing compressed gas of any type to aid or facilitate recreational underwater activities
"Recreational fire appliances"	means heating or cooking appliances with open flames such as fireplaces, charcoal galley ovens, barbecues, spit roasts and fire pits
"Rescue boat"	means a boat complying with the requirements of the LSA Code and designed to rescue persons in distress and for marshalling liferafts
"Restricted Charter Private Yacht"	means a Private Yacht restricted to charters for not more than 84 days per calendar year and: 1. has a minimum load line length of 18 metres; and 2. carries no more than 12 passengers or social guests; and 3. is restricted to operating in forecast or actual wind of a maximum Beaufort Force 4 for a motor yacht or Beaufort Force 6 for a sailing yacht; and 4. remains within 60 nautical miles of a safe haven* * the BMA may permit operation on specified routes up to 90 nautical miles
"Retro-reflective material"	means a material which reflects in the opposite direction a beam of light directed on it
"Rocket parachute flare"	means a pyrotechnic signal complying with the requirements of the LSA Code
"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 designed to carry sail, whether as a sole means of propulsion or as a supplementary means
"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

"Sauna"	means a hot room with temperatures normally varying between 80°C and 120°C where the heat is provided by a hot surface (e.g., by an electrically heated oven) and may include the space where the oven is located and adjacent bathrooms
"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
"Sea Area A2"	means an area, excluding sea area A1, within the radiotelephone coverage of at least one MF coast station in which continuous DSC alerting is available
"Sea Area A3"	means an area, excluding sea areas A1 and A2, within the coverage of an INMARSAT geostationary satellite in which continuous alerting is available
"Sea Area A4"	means an area outside sea area A1, A2 and A3
"Self-activating smoke signal"	means a signal complying with the requirements of the LSA Code
"Self-igniting light"	means a light complying with the requirements of the LSA Code
"Service spaces"	means those spaces used for galleys, pantries containing cooking appliances, lockers, store-rooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces
"Ships constructed"	means ships the keels of which are laid or which are at a similar stage of construction
"Short Range Yacht"	means an existing vessel under 500GT or a new vessel under 300GT restricted to operating in forecast or actual wind of a maximum Beaufort Force 4, and within 60 nautical miles of

a safe haven (the BMA may permit operation on specified routes up to 90 nautical miles from a safe haven as appropriate)

"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

"SLA" means Safe Landing Area for helicopter operations, which is the area bounded by the perimeter line and perimeter lighting. The construction of the OFS and LOS segments should ensure that the main rotor will not risk conflict with obstacles when the nose of the helicopter is butted-up to, but not projecting over, the perimeter line. Thus the pilot, when landing in unusual circumstances, has confidence that he can touch down provided that all wheels are within the SLA and the nose of the helicopter is not projecting over the nearest perimeter line ahead. However, only correct positioning over the aiming circle will ensure proper clearance with respect to physical obstacles, provision of ground effect, and provision of adequate passenger access/egress

"Smoke damper" means a device installed in a ventilation duct, which under normal conditions remains open allowing flow in the duct, and is closed during a fire, preventing the flow in the duct to restrict the passage of smoke and hot gases. A smoke damper is not expected to contribute to the integrity of a fire rated division penetrated by a ventilation duct. In using the above definition the following terms may be associated:
"*automatic smoke damper*" is a smoke damper that closes independently in response to exposure to smoke or hot gases;
"*manual smoke damper*" is a smoke damper intended to be opened or closed by the crew by hand at the damper itself; and

	"*remotely operated smoke damper*" is a smoke damper that is closed by the crew through a control located at a distance away from the controlled damper
"Sprinkler"	means a fixed pressure water-spraying fire-extinguishing system complying with the provisions of the Fire Safety Systems Code
"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
"Standard Superstructure Height 'h_{std}'"	means standard superstructure height which shall be taken as- .1 1.8 metres for vessels up to 75 metres in length; .2 2.3 metres for vessels of 125 metres or more in length; and .3 superstructure heights for vessels of intermediate lengths shall be obtained by interpolation
"Statement of Compliance"	means a certificate that is issued where compliance is to the associated standards is voluntary and the standards have been substantially met

"STCW"	means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended
"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)
"Storm covers"	means a portable protective closure fitted to a glazed opening and which is fitted to the outside (weatherside) of the vessel. Also known as a Storm Shutter
"Sub-division length or "(L_s)""	of a ship means the greatest projected moulded length of that part of the ship at or below deck or decks limiting the vertical extent of flooding with the ship at the Design Waterline draft
"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)
"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
"Tender poles"	means a rigging spar or specific pole used to aid in the launching of a tender, normally on sailing vessels to offset a halyard's lead to give a vertical lift of a rescue boat
"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
"Two-way VHF radiotelephone set"	means a portable or a fixed VHF installation for survival craft complying with the performance standards adopted by the IMO contained in A.762(18) or any Resolution amending or replacing it which is considered by the BMA to be relevant from time to time
"Voyage"	includes an excursion
"Watertight"	means having scantlings and arrangements 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
"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
"Wing station"	means a manoeuvring station at which the vessel can be manoeuvred with increased visibility of the vessel side, normally with restricted navigational capability used when berthing rather than to hold a navigational watch
"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 AND 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)[5] 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 Vessels shall comply with all of the requirements of MARPOL as prescribed by the BMA. For vessels under 400GT it is the owner's responsibility to comply with local Administration/port state requirements and for dealing with oily bilge water retention etc.

3.3.2 Every ship of 100GT and above, and every ship which is certified to carry 15 persons or more, shall carry a garbage management plan which shall include the written procedures agreed for collection, storage, processing and disposal of garbage; and a garbage record book recording disposal and incineration, as outlined in regulation 9 of Annex V of MARPOL.

3.3.3 Special local requirements may exist in national sea areas, ports and harbours. The attention of owners/operators is drawn to the need to comply with local requirements as appropriate.

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

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

3.4.1 This Convention applies to every ship of 400GT and above

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

3.5.1 Vessels that use water for ballasting purposes are required to comply with the BWM Convention[6].

3.6 Convention on Civil Liability for Bunker Oil Pollution Damage, 2001

3.6.1 Ships of 1,000GT and above are required to carry an appropriate level of insurance covering liability for costs arising from pollution damage following a bunker oil spill from the ship.

3.6.2 As evidence that adequate insurance cover is in place the owner or operator of the ship is required to carry a Certificate to this effect issued by the BMA[7].

3.6.3 The BMA shall issue such a Bunkers Certificate only where it is satisfied that the insurance cover provided is acceptable.

3.7 Nairobi International Convention on the Removal of Wrecks, 2007

3.7.1 Ships of 300 gross tonnage and above are required to carry an appropriate level of insurance covering liability for costs arising from the costs of wreck removal.

3.7.2 As evidence that adequate insurance cover is in place the owner or operator of the ship is required to carry a Certificate to this effect issued by the BMA[8].

3.7.3 The BMA will issue such a Wreck Removal Convention Certificate only where it is satisfied that the insurance cover provided is acceptable.

3.8 The Maritime Labour Convention, 2006 (MLC)

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

3.9 The Polar Code

3.9.1 The Polar Code applies to ships operating in polar waters as per SOLAS Chapter XIV and the Polar Code[9].

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[6] See BMA Information Bulletin No.165
[7] See BMA Information Bulletin No.112
[8] See BMA Information Bulletin No.157
[9] See BMA Information Bulletin No.167

3.9.2 Ships constructed before 1 January 2017 shall meet the relevant requirements of SOLAS Chapter XIV and the Polar Code by the first intermediate or renewal survey, whichever occurs first, after 1 January 2018.

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

3.10 Ships using low-flashpoint fuels

3.10.1 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.

3.10.2 Seafarers working in ships subject to the IGF Code shall receive appropriate training and certification[10].

3.11 Health and Safety

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

3.12 Bahamas Legislation

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

[10] See BMA Information Bulletin No.162

4 CONSTRUCTION AND STRENGTH

4.1 General Requirements

4.1.1 All vessels shall have a freeboard deck.

4.1.2 All vessels shall be fitted with a weather deck throughout the length of the vessel and be of adequate strength to withstand the sea and weather conditions likely to be encountered in the declared area(s) of operation.

4.1.3 The declared area(s) of operation and any other conditions which restrict the use of the vessel at sea shall be recorded on the load line certificate issued to the vessel.

4.1.4 The choice of hull construction material affects fire protection requirements, for which reference should be made to section 14.

4.1.5 Where a considerable risk of lightning strike is identified vessels shall have lightning strike protection.

4.1.6 Where there are no Recognised Organisation requirements for the fitting of double bottoms, SOLAS II-1/9 shall be applied to vessels of over 80m Length.

4.2 Structural Strength

4.2.1 All vessels over 500 GT must be Classed by a Recognised Organisation.

4.2.2 Un-Classed vessels of less than 500 GT may be considered for restricted operation within the Short Range Yacht category.

4.2.3 Attention shall be paid to local or global hull strength requirements for the provision of ballast.

4.3 Watertight Bulkheads

4.3.1 Section 11 of the Code deals with subdivision and damage stability requirements which will determine the number and positioning of watertight bulkheads defined below.

4.3.2 Watertight bulkheads shall be fitted in accordance with the following requirements:

.1 The strength of watertight bulkheads and their penetrations, and watertight integrity of the division shall be in accordance with the requirements of a Recognised Organisation;

.2 Generally, openings in watertight bulkheads shall comply with the standards required for passenger vessels, as defined in SOLAS regulation II-1. Hand operation from above the bulkhead deck and a hydraulic accumulator may be omitted if each door has its own individual power-pack electrically driven via the emergency switchboard, and control voltage from emergency battery, and each door can be operated manually at the door. Edge strips which stop the door closing on contact are not permitted.

.3 Approved hinged doors may be provided for infrequently used openings in watertight compartments, where a crew member will be in immediate attendance when the door is open at sea. Audible & visual alarms shall be provided in the wheelhouse.

.4 Unless otherwise required by section 4.4, watertight doors in yachts under 500 GT may be approved hinged doors provided that there is an audible and visual alarm on the Bridge indicating when the door is open. The doors are to be kept closed at sea and marked accordingly. A time delay for the alarm is acceptable.

.5 Procedures for the operation of watertight doors shall be agreed with the Recognised Organisation or the BMA and posted in suitable locations. Watertight doors shall be normally closed, with the exception of sliding watertight doors providing the normal access to frequently used living and working spaces. Additionally, when an access is unlikely to be used for lengthy periods, the door shall also be closed. All watertight doors shall be operationally tested before a ship sails and at least once a week

4.4 Enclosed Compartments within the Hull and below the Freeboard Deck provided with Access through Openings in the Hull

4.4.1 Compartment(s) below the freeboard deck, provided for recreational purposes, oil fuelling/fresh water reception or other purposes to do with the business of the vessel and having access openings in the hull, shall be bounded by watertight divisions without any opening (i.e. doors, manholes, ventilation ducts or any other opening) separating the compartment(s) from any other compartment below the freeboard deck, unless provided with sliding watertight doors complying with section 4.3.2, or for vessels under 500 GT, hinged doors complying with section 4.4.2.

4.4.2 For vessels less than 500 GT, openings from any other compartment below the freeboard deck may be fitted with hinged watertight doors provided:

.1 after flooding through the shell opening of the space containing the shell opening, the resultant waterline is below the sills of the internal openings in that space, or

.2 (a) bilge alarms are fitted in the compartment containing the shell opening, with a visual and audible warning on the bridge, and
(b) any hinged door opens into the compartment containing the shell opening, and
(c) "open" door alarms, both visual and audible fitted on the bridge, and
(d) the door is to be fitted with a single closing mechanism, and
(e) where the sill height of the internal door is not higher above the deepest loaded waterline than the sill height of the shell opening, then 4.4.4.2 and 4.4.4.3 shall also be considered to the satisfaction of the BMA.

4.4.3 Openings in the hull shall comply with SOLAS regulation II-1/15-1 - External openings in cargo ships. Provision shall be made to ensure that doors may be manually closed and locked in the event of power or hydraulic failure. Openings are generally to be fitted with a sill not less than 600 millimetres above the Design Waterline. Means shall be provided to prevent the unauthorised use of the doors locally through provision of secondary or remote control, through an interlock, dual control process or procedure.

4.4.4 Openings in the hull with a sill height less than 600 millimetres above the Design Waterline may be specially considered by the BMA. This consideration shall include but is not limited to:

.1 doors from the space providing internal access are to have a sill height at least 600 millimetres above the Design Waterline;

.2 the effect of flooding on stability is considered;

.3 operational controls and limitations on when and where opening may be used.

4.4.5 Protection of safety critical systems such as those for securing of the hull opening closed and any provided in accordance with Section 14, shall have a liquid ingress protection of level 5 (e.g. IP 65) in accordance with the International Protection (IP) Marking, IEC Standard 60529 or equivalent.

4.5 Rigging on Sailing Vessels

4.5.1 General

4.5.1.1 The condition of the rig shall be monitored in accordance with a Maintenance Manual and a planned maintenance schedule. The schedule shall include, in particular, regular monitoring of all the gear associated with safe work aloft and on the bowsprit (see section 22).

4.5.2 *Masts, spars and standing rigging*

4.5.2.1 Dimensions and construction materials of masts and spars and dimensions of standing rigging including connection to chain plates shall be in accordance with the requirements or recommendations of a Recognised Organisation or a recognised national or international standard.

4.5.2.2 The associated structure for masts and spars (including chainplates, fittings, decks and floors) shall be constructed to effectively carry and transmit the forces involved.

4.5.2.3 Compliance with 4.5.2.1 and 4.5.2.2 shall be confirmed by a design review and approval by a Recognised Organisation (e.g. Rig Design Certificate) which is assigned with the review of the rig.

4.5.2.4 The Maintenance Manual provided by the mast manufacturer shall be reviewed and approved by the Recognised Organisation which is assigned to review the rig design.

4.5.2.5 A physical survey on the rig stepping procedure and the rig behaviour during sea trials is to be carried out by or on behalf of the Recognised Organisation that is involved with the classification of the vessel's hull.

4.5.2.6 Annual surveys on the vessel shall include reviewing records and history of rig maintenance measures against the specifications provided by the Maintenance Manual.

4.5.3 *Rigging fittings*

4.5.3.1 The strength of all blocks, shackles, rigging screws, cleats and associated fittings and attachment points shall exceed the breaking strain of the associated running or standing rigging.

4.5.4 *Sails*

4.5.4.1 Adequate means of reefing or shortening sail shall be provided.

4.5.4.2 Sailing vessels operating as Short Range Yachts need not carry storm canvas.

4.5.4.3 All other vessels shall either be provided with separate storm sails or have specific sails designated and constructed to act as storm canvas.

4.6 Asbestos Containing Materials

4.6.1 As per SOLAS II-1/3-5, 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, in contravention of SOLAS regulation II-1/3-5, action should be taken by the Company 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 Recognised Organisations 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.

4.7 Additional Equivalence Considerations

4.7.1 None

5 WEATHERTIGHT INTEGRITY

5.1 Virtual Freeboard Deck

5.1.1 For the purposes of this section only, where actual freeboard to the weather deck exceeds that required by ICLL 66 by at least one standard superstructure height, openings on that deck, abaft of the forward quarter, may be assumed to be in position 2. This is to be taken, unless otherwise stated, as defined in ICLL 66.

5.1.2 For vessels up to 75m load line length, a standard superstructure height is to be taken as 1.8 m. For vessels over 125 m load line length, this is to be taken as 2.3 m. Superstructure heights for vessels of intermediate lengths should be obtained by interpolation.

5.2 Hatchways and Skylight Hatches

5.2.1 *General requirements*

5.2.1.1 All openings leading to spaces below the weather deck not capable of being closed weathertight must be enclosed within either an enclosed superstructure or a weathertight deckhouse of adequate strength meeting with the requirements of the Load Line assigning authority.

5.2.1.2 All exposed hatchways which give access from position 1 and position 2 shall be of substantial weathertight construction and provided with efficient means of closure. Weathertight hatch covers should be permanently attached to the vessel and provided with adequate arrangements for securing the hatch closed.

5.2.1.3 Hatches which are designated for escape purposes shall –

.1 be provided with covers which shall be openable from either side and in the direction of escape they are to be openable without a key. All handles on the inside shall be non-removable[11];

.2 be readily identified and easy and safe to use, having due regard to its position; and

.3 Not be required to have a coaming provided that:

a. The hatch cover is weathertight; and

b. The hatch shall be closed at sea and marked accordingly and shall be provided with open/close indication at the navigating position.

5.2.2 *Hatchways which are open at sea*

5.2.2.1 In general, hatches shall be kept closed at sea. However, hatchways which may be kept open for access at sea are to be as small as practicable (a maximum of 1

[11] See MSC/Circ.847 Interpretations of vague expressions and other vague wording in SOLAS Chapter II-2

square metre in clear area), and fitted with coamings of at least 300 mm in height in positions 1 and 2. Hatchways should be as near to the centreline as practicable, especially on sailing vessels. Covers of hatchways shall be permanently attached to the hatch coamings and, where hinged, the hinges are to be located on the forward side.

5.3 Doorways and Companionways

5.3.1 Doorways located above the weather deck

5.3.1.1 External doors in deckhouses and superstructures shall be weathertight[12]. Doors opening directly onto staircases which are located in the following positions shall have coaming heights of at least:

Location	Unrestricted Yachts	Short Range Yachts
A	600mm	300mm
B	300mm	150mm
C	150mm	75mm

Location A The door is in the forward quarter length of the vessel and is used when the vessel is at sea.

Location B The door is in an exposed forward-facing location aft of the forward quarter length.

Location C The door is in a protected location aft of the forward quarter length, or an unprotected door on the first tier deck above the weather deck.

5.3.1.2 Weathertight doors should be arranged to open outwards and when located in a superstructure side, be hinged at the forward edge. Alternative closing arrangements will be considered providing it can be demonstrated that the efficiency of the closing arrangements and their ability to prevent the ingress of water will not impair the safety of the vessel.

5.3.1.3 An access door leading directly to the engine room from the weather deck should be fitted with a coaming of height of at least:

Location	Unrestricted Yachts	Short Range Yachts
Position 1	600 mm	450 mm
Position 2	380 mm	200 mm

[12] See ISO 14884:2015 Large yachts -- Weathertight doors -- Strength and weathertightness requirements or IACS UR S14 - Testing Procedures of Watertight Compartments, Section 4.4.3.

5.3.1.4 Construction and securing standards for weathertight doors which are provided for use only when the vessel is in port or at anchor in calm sheltered waters and are locked closed when the vessel is at sea, may be considered individually. Coaming heights need not meet 5.3.1.1.

5.3.1.5 Proposals to reduce the coaming heights required by 5.3.1.1 and 5.3.1.3 shall be subject to special consideration and approval by the BMA, having regard for the protected location of the weathertight door, the space to which it serves, increased freeboard and increased water freeing arrangements.

5.3.2 *Companion hatch openings*

5.3.2.1 Companionway hatch openings which give access to spaces below the weather deck should be fitted with a coaming, the top of which is at least 300 millimetres above the deck, or 150 millimetres in the case of Short Range Yachts.

5.3.2.2 Washboards may be used to close the vertical opening. When washboards are used, they should be so arranged and fitted that they will not be dislodged readily. Whilst stowed, provisions shall be made to ensure that they are retained in a secure location.

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

5.4 Glazed Openings & Skylights

5.4.1 *General*

5.4.1.1 Glazed openings and skylights shall –

.1 be made from toughened safety glass. In case of chemically toughened glass, it shall be qualified by testing in accordance with a recognised standard, such as EN 1288-3, based on the requirements given in ISO 11336-1. Regular inspections of the glazed openings, with particular reference to the surface condition, shall form part of the operational procedures and annual surveys;

.2 not be fitted in such a position that their sills are below a line drawn parallel to the freeboard deck at side and having its lowest point 2.5% of the breadth (B), or 500 millimetres, whichever is the greatest distance, above the design waterline;

.3 be attached to the ship in such a manner, that they are capable of fulfilling their role in the application of ICLL requirements;

.4 follow the requirements of Section 17 where they are for glazed openings in the navigating position;

.5 not be fitted in the hull in the way of the machinery space; and

.6 be of the non-readily opening type which shall be securely closed when the vessel is in navigation and indication provided on the bridge that they are closed.

5.4.2 When glazed openings are fitted by bonding, the following provisions shall be observed –

1. proposals shall include measures to ensure the integrity of the bond line taking into account environmental and ageing effects; and
2. arrangements shall be such that glazed openings and doors cannot fall from their mounting should the bond line fail due to the effects of fire when required to be fire rated.

5.4.3 Where glazed openings protect buoyant volumes, they shall be designed using the pressure heads derived from a recognised International Standard such as ISO 5780 or ISO 11336-1.

5.4.4 Where glazed openings do not protect buoyant volumes, they shall be designed using the pressure heads rules of a Recognised Organisation or a recognised International Standard such as ISO 11336-1.

Deadlights

5.4.5 Glazed openings within the buoyant part of the hull shall be provided with deadlights so arranged that they can be easily and effectively closed and secured watertight.

5.4.6 Deadlights may be portable provided these are stored in an easily accessible location and are readily mountable in a seaway. Instructions to the Master as to when deadlights shall be applied to portlights shall be provided.

Storm Covers

5.4.7 Storm covers shall be required in the following locations, where deadlights are not already required by Section 5.4.5:

.1 glazed openings in the front and sides of Level 1;
.2 glazed openings in the front of Level 2; and
.3 where storm covers are interchangeable between port and starboard, a minimum of 50% of each size shall be provided.

5.4.8 Where required by Section 5.4.7, if the glazed openings meet an enhanced structural standard, in accordance with Recognised Organisation rules, a recognized International Standard, or a factor of 1.5 applied to the design pressure of the glazed opening, then storm covers are not required.

5.4.9 A- and B-Class cabin bulkheads and doors are accepted in place of deadlights or storm covers fitted to glazed openings, except in the following locations where deadlights or storm covers are to be provided:

.1 in Levels 1 and 2 when considered buoyant in the stability calculations;

.2 in Levels 1 and 2 when above the buoyant part of the hull and separating forward facing glazed openings from a direct access leading below;

.3 In Level 1 when above the buoyant part of the hull and separating side facing glazed openings from a direct access leading below.

Skylights

5.4.10 Fixed or opening skylights shall-

.1 have a glazing thickness appropriate to their size and position as required for glazed openings;

.2 be provided with protection from mechanical damage to the skylight load-bearing glazing in any position;

.3 except where the arrangements comply with 5.4.11, when fitted in Level 1 or 2, be provided with deadlights or storm covers that can be easily and safely mounted in a seaway; and

.4 if designated for escape purposes, be provided with a means of opening from either side of the skylight provided that in the direction of escape they are able to be opened without a key.

5.4.11 The BMA may permit the storm covers specified in Sections 5.4.10.3 to be omitted provided the glazing meets Section 5.4.8.

Strength

5.4.12 Glazed openings, together with their frames, deadlights and storm covers, if fitted, shall meet an appropriate national or international standard or the rules regarding side scuttles and windows of a Recognised Organisation[13].

5.4.13 Where the glazing material, glazing thickness, or fixing of the glazed opening do not meet the requirements of a recognised standard[14] they may be tested[15], to the satisfaction of the BMA, in accordance with the following provisions:

.1 the glazed opening shall be tested to a minimum test pressure of 4 times the required design pressure derived from an appropriate national or international standard, provided that as a minimum, the

[13] For illustration purposes see the requirements set out in Part 4, Chapter 2 Section 11.3 of Lloyd's Register Rules and Regulations for the Classification of Ships

[14] For example, ISO 11336-1 Large yachts – Strength, weathertightness and watertightness of glazed openings

[15] For example, hydrostatic testing of the windows and frames or ISO 11336-1 Large yachts – Strength, weathertightness and watertightness of glazed openings

calculated thicknesses shall meet the Recognised Organisation requirements; and

.2 the testing shall be witnessed by a Recognised Organisation.

5.5 Ventilators and Exhausts

5.5.1 Adequate ventilation shall be provided throughout the vessel. The accommodation shall be protected from the entry of gas and/or vapour fumes from machinery, exhaust and fuel systems. Where machinery exhaust systems pass though accommodation, they shall be fitted in a gas tight trunk or each space shall be fitted with a carbon monoxide detector, having an alarm provided locally and at a continuously manned station

5.5.2 Ventilators shall be of efficient construction. Generally, ventilators serving any space below the freeboard deck or an enclosed superstructure shall have a coaming of minimum height of:

Location	Unrestricted Yachts	Short Range Yachts
Forward quarter length	900 mm	450 mm
Elsewhere	760 mm	380 mm

5.5.3 Ventilators shall be kept as far inboard as practicable and the height above the deck of the ventilator opening should be sufficient to prevent the ingress of water when the vessel heels.

5.5.4 The ventilation of spaces such as the machinery space, which must remain open, requires special attention with regard to the location and height of the ventilation openings above the deck, taking into account the effect of downflooding angle on stability standard (see section 11) and alternative ventilation for use in bad weather.

5.5.4.1 The means of closure of ventilators serving the machinery space shall be selected with regard to the fire protection and extinguishing arrangements provided in the machinery space.

5.5.5 Engine exhaust outlets which penetrate the hull below the freeboard deck shall be provided with means to prevent backflooding into the hull through a damaged exhaust system. For vessels operating on unrestricted service a positive means of closure shall be provided. The system shall be of equivalent construction to the hull on the outboard side of the closure. For Short Range Yachts, where the fitting of a positive closure is not practicable, the exhaust shall be looped up above the waterline on the outboard side of the system, to a

minimum height of 1000 millimetres and be of equivalent construction to the hull.

5.5.6 Ventilators shall be provided with permanently attached mans of weathertight[16] closure. Where the full coaming heights specified in 5.5.2 are met, permanently attached means of closure may be omitted if it can be shown that the open end of a ventilator is afforded adequate protection by other structure(s) which shall prevent the ingress of water.

5.5.7 Proposals to reduce the coaming heights required by 5.5.2 may be subject to special consideration and approval by the BMA, having regard for their protected location, means to prevent the ingress of water, excess freeboard and impact on stability.

5.6 Air Pipes

5.6.1 Air pipes serving fuel and other tanks shall be of efficient construction, led above the bulkhead deck and provided with automatic closing devices. Where the full coaming heights of 5.6.2 are met, automatic closing devices may be omitted if it can be shown that the open end of an air pipe is afforded adequate protection by other structure(s) which will prevent the ingress of water.

5.6.2 Air pipes shall be kept as far inboard as practicable and be fitted with a coaming of sufficient height to prevent inadvertent flooding. Generally, air pipes to tanks shall have a minimum coaming height of:

Location	Unrestricted yachts	Short Range Yachts
On weather deck	760 mm	380 mm
Elsewhere	450 mm	225 mm

5.6.3 Air pipes to fuel tanks shall terminate at a height of not less than 760 millimetres above either the top of the filler pipe for a gravity filling tank or, the top of the overflow tank for a pressure filling tank.

5.6.4 Proposals to reduce the coaming heights required by 5.6.2 may be subject to special consideration and approval by the BMA, having regard for their protected location, means to prevent the ingress of water, excess freeboard and impact on stability

[16] Weathertightness tested in accordance with Section 8.1.1 of ISO 14884:2015 Large yachts -- Weathertight doors -- Strength and weathertightness requirements or IACS UR S14 - Testing Procedures of Watertight Compartments, Section 4.4.3

5.7 Scuppers, Sea Inlets and Discharges and other Hull Penetrations

5.7.1 The standards of ICLL 1966 shall be applied to every discharge led through the shell of the vessel as far as it is reasonable and practicable to do so, and in any case, all sea inlet and overboard discharges shall be provided with efficient shut-off valves arranged in positions where they are readily accessible at all times.

5.7.2 Underwater lights and associated penetrations fitted in the hull shall be approved by the Recognised Organisation.

5.8 Materials for Valves and Associated Piping

5.8.1 Valves which are fitted below the waterline shall be of steel, bronze or other material having a similar resistance to impact fire and corrosion. Non-metallic valves will not normally be considered equivalent.

5.8.2 The associated piping shall, in areas as indicated above, be of steel, bronze, copper or other equivalent material. Non-metallic pipework will not normally be considered equivalent.

5.8.3 Where the use of plastic piping is proposed, it shall be specially considered and full details of the type of piping, its intended location, and use, shall be submitted for approval; with regard to watertight integrity, any plastic piping shall be above the waterline. Due regard should be paid to the IMO Fire Test Procedures Code and 14.10.4.4 or 14.30.5.

5.8.4 The use of flexible piping in any location shall be kept to a minimum compatible with the essential reason for its use. Flexible piping and the means of joining it to its associated hard piping system shall be approved as fit for the purpose.

5.9 Additional Equivalence Considerations

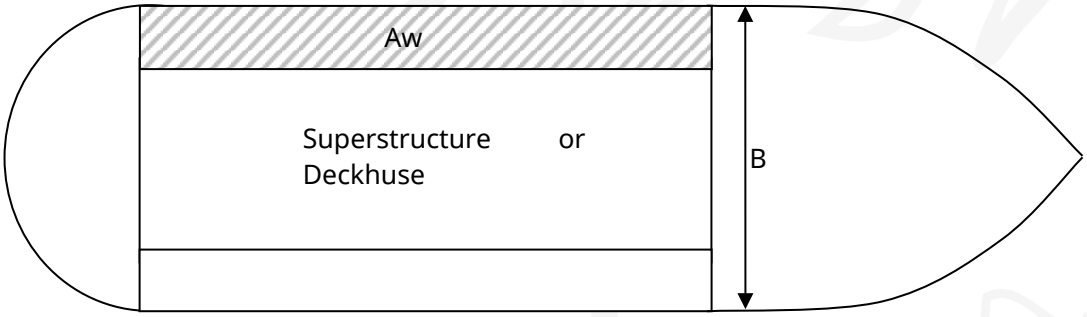
.1 Openings to be kept closed at sea;
.2 Enhanced Bilge Pumping capacity and additional bilge alarms;
.3 Compliance with damage stability if not already a requirement (see section 11);
.4 Provision of dorade boxes or baffle systems to prevent direct ingress of water;
.5 Alternative ventilation for use in bad weather;
.6 Consideration of downflooding angle and reduced risk of green sea loads, i.e. protected position;
.7 Enhanced survey inspection regime;
.8 Operational Limitations.

6 WATER FREEING ARRANGEMENTS

6.1 General Requirements

6.1.1 The standards for water freeing arrangements shall comply with ICLL on any weather decks in the forward quarter and up to Position 2 elsewhere. In any case the intention shall be to achieve a standard of safety which is at least equivalent to the standard of the ICLL to the satisfaction of the BMA given the design and use of the vessel.

6.1.2 Additionally, where a well is created on each side of the vessel between a superstructure or deckhouse, and the bulwark in way of that superstructure or deck house, the following formula may be used to determine the required freeing port areas on each side of the vessel for the well concerned:



$$FP_{REQ} = 0.28 \times \frac{A_w}{B}$$

Where;

FP_{REQ} = Freeing port area required
A_w = Area of well in way of superstructure or deckhouse
B = Full beam at deck,

6.1.3 On sailing vessels, where the solid bulwark height does not exceed 150 millimetres, specific freeing ports, as defined above, are not required.

6.1.4 For Short Range Yachts, it is considered that the requirement for freeing port area for a forward or aft well may be reduced by a form factor equal to the ratio of (actual area well) divided by (length of well x breadth of well). Dimensions shall be taken at half height of the bulwark. This may be reduced by 50% providing it can be shown that the intact stability of the yacht remains acceptable if the well is flooded to any level up to the bulwark height and that area provided shall allow the well to drain in less than 3 minutes.

6.2 Recesses

6.2.1 Any recess in the weather deck shall be of weathertight construction and shall be self-draining under all normal conditions of heel and trim of the vessel. A swimming pool or spa bath open to the elements should be treated as a recess.

6.2.2 The means of drainage provided should be capable of efficient operation when the vessel is heeled to an angle of 10^0 in the case of a motor vessel (see section 10.1.3), and 30° in the case of a sailing vessel.

6.2.3 The drainage arrangements should have the capability of draining the recess (when fully charged with water) within 3 minutes when the vessel is upright and at the load line draught. Means should be provided to prevent the backflow of sea water into the recess.

6.2.4 When it is not practical to provide drainage which meets the requirements of section 6.2.2, alternative safety measures may be proposed for approval by the BMA. Where the above requirements for quick drainage cannot be met, the effect on intact and damage stability should be considered taking into account the mass of water and its free surface effect.

6.3 Swimming Pools (Including Spa Baths and Jacuzzis)

6.3.1 All swimming pools shall have their effect on intact and damage stability considered taking into account the mass of water and its free surface effect.

6.3.2 If there are loading conditions where swimming pools shall be emptied in order to comply with stability requirements[17] of Section 11, these loading conditions shall be placed in a separate section of the approved stability booklet with the following note added:

In this loading condition the vessel may not have its [swimming pool] [spa bath] [jacuzzi] full, due to insufficient stability

6.3.3 All loading conditions included in the approved stability book shall be shown to meet the damage stability requirements of Section 11.

6.4 Additional Equivalence Considerations

6.4.1 Freeing arrangements may take account of a reduced permeability and volume of the well, when compared to a full size well.

[17] In evaluating intact stability compliance, the effects of spill out of swimming pool contents may be taken into account

6.4.2 For existing vessels, the BMA may take into account the vessel's past performance in service, the declared area(s) of operation and any other conditions which restrict the use of the vessel at sea which shall be recorded on the International Load Line Certificate issued to the vessel (see Section 4.1.3).

7 MACHINERY INSTALLATIONS

PART A- VESSELS OF LESS THAN 500 GT

7.1 General Requirements

7.1.1 The machinery and its installation shall meet with the requirements of a Recognised Organisation. The Class Survey or Notation shall include, as a minimum, propulsion and electrical generation machinery and shafting. For existing and new vessels which operate with periodically unattended machinery spaces, the machinery and its installation shall meet the standards of SOLAS II-1/Part E - *Additional requirements for periodically unattended machinery spaces*, so far as is reasonable and practicable to do so.

7.1.2 Plastic piping may be accepted where the piping and the arrangements for its use meet the requirements of the IMO Fire Test Procedures Code.

7.1.3 The requirements for main propulsion are based upon the installation of diesel-powered units. When other types of main propulsion are proposed, the arrangements and installation should be specially considered. Where gas turbines are to be fitted, attention should be paid to the guidance contained within the IMO High-speed Craft Code, and installation is to be to the satisfaction of the BMA.

7.1.4 Notwithstanding the requirements of section 7.1.1, in a fuel supply system to an engine unit, where a flexible section of piping is provided, connections should be of a screw type or equivalent approved type. Flexible pipes should be fire resistant/metal reinforced. Materials and fittings should be of a suitable recognised national or international standard.

7.2 Installation

7.2.1 Notwithstanding the requirements referred to in section 7.1, the machinery, fuel tanks and associated piping systems and fittings should be of a design and construction adequate for the service for which they are intended, and should be so installed and protected as to reduce to a minimum any danger to persons during normal movement about the vessel, with due regard being made to moving parts, hot surfaces, and other hazards.

72.2 Means should be provided to isolate any source of fuel which may feed a fire in an engine space fire situation. A fuel shut-off valve(s) should be provided which is capable of being closed from a position outside the engine space. The valve(s) should be fitted as close as possible to the fuel tank(s).

7.2.3 All external high pressure fuel delivery lines between the high pressure fuel pumps and fuel nozzles should be protected with a jacketed tubing system capable of containing fuel resulting from a high-pressure line failure. The jacketed tubing system should include means for collection of leakage and arrangements should be provided for an alarm to be given in the event of a fuel line failure.

7.2.4 When a glass fuel level gauge is fitted it should be of the "flat glass" type with self-closing valves between the gauge and the tank.

7.3 Additional Equivalence Considerations

7.3.1 None

7.4 Alternative Design and Arrangements

7.4.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

PART B – VESSELS OF 500 GT AND ABOVE

7.5 General Requirements

7.5.1 For existing and new vessels the machinery and its installation should meet the requirements of a Recognised Organisation and of SOLAS II-1/Part C *Machinery installations* and II-1/Part E - *Additional requirements for periodically unattended machinery spaces*, so far as is reasonable and practicable to do so.

7.5.2 In any case the intention should be to achieve a standard of safety which is at least equivalent to the standard of SOLAS. Equivalence may be achieved by incorporating increased requirements to balance deficiencies and thereby achieve the required overall standard.

7.5.3 Where gas turbines are to be fitted, attention should be paid to the guidance contained within the IMO High-speed Craft Code, and installation is to be to the satisfaction of the BMA.

7.5.4 For vessels installed with high powered engines designed for short sprint speeds, the BMA may, on a case by case basis, relax SOLAS II-1/26.11 requirements for fuel oil service tanks sized for maximum continuous rating, and use the vessel's cruising speed.

7.6 Additional Equivalence Considerations

7.6.1 None

7.7 Alternative Design and Arrangements

7.7.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

8 ELECTRICAL INSTALLATIONS

PART A – VESSELS OF LESS THAN 500 GT

8.1 Installation

8.1.1 Particular attention shall be paid to the provision of overload and short circuit protection of all circuits, except engine starting circuits supplied from batteries.

8.1.2 Electrical devices working in potentially hazardous areas, into which petroleum vapour or other hydrocarbon gas may leak, shall be of a type certified safe for the hazard.

8.2 Lighting

8.2.1 Lighting circuits, including those for emergency lighting, shall be distributed through the spaces so that a total blackout cannot occur due to failure of a single protective device.

8.2.2 An emergency source of lighting should be provided which shall be independent of the general lighting system. This source should be sufficient for up to 3 hours duration and shall include navigation light supplies. The lighting is to provide sufficient lighting for personnel to escape from the accommodation or working spaces to their muster station and launch and board survival craft. Additionally, this light, supplemented by torches, shall be sufficient to permit emergency repairs to machinery, etc. The emergency source of power shall be independent of the main power supply, external to the engine room, and with separate distribution.

8.3 Batteries

8.3.1 Batteries of a type suitable for marine use and not liable to leakage shall be used. Areas in which batteries are stowed shall be provided with adequate ventilation to prevent an accumulation of gas which is emitted from batteries of all types. Reference shall also be made to Section 34.

8.3.2 Where batteries are used for propulsion and/or electric power supply purposes during ship operations, the battery system design and operation shall consider the guidelines provided in Section 34

8.4 Emergency Power

8.4.1 Emergency power shall be readily available to supply the required emergency lighting, radio installation and navigation aids for a minimum of 3 hours. As a minimum, the navigation aids to be supplied by emergency power to include Global Navigation Satellite System (GNSS), echo sounder and AIS. The emergency power supply shall be adequate to also supply any electrical

emergency equipment fitted, such as fire pumps, bilge pumps, watertight doors, and rescue boat davit.

8.4.2 The emergency source of power shall be independent of the main power supply, external to the engine room, and with separate distribution.

8.5 Additional Equivalence Considerations

8.5.1 None

8.6 Alternative Design and Arrangements

8.6.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

PART B – VESSELS OF 500 GT AND ABOVE

8.7 General Requirements

8.7.1 The electrical equipment and its installation should meet the standards of SOLAS regulations II-1/Part D - Electrical installations and II-1/Part E - Additional requirements for periodically unattended machinery spaces, where appropriate, so far as it is reasonable and practicable to do so.

8.7.2 The emergency generator, if fitted, should be located above the uppermost continuous deck but may be located below this deck provided it is protected from the effects of fire and flooding. In all cases, the emergency generator should be separated from main generators and main switchboard by a division capable of ensuring its continued operation. The emergency generator should be self-contained (independent of a sea water suction) and readily accessible from the open deck.

8.7.3 Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall be routed clear of galleys, machinery places of Category A and their casings, spaces for storage of petrol, and other high-risk fire areas.

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

8.8 Additional Equivalence Considerations

8.8.1 None

8.9 Alternative Design and Arrangements

8.9.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

9 STEERING GEAR

PART A – VESSELS OF LESS THAN 500 GT

9.1 General Requirements

9.1.1 The steering gear and its installation shall, in general, meet with the requirements of a Recognised Organisation.

9.1.2 In the event that the above requirements cannot be met on an existing vessel, the BMA may be requested to consider and approve alternative arrangements to achieve adequate safety standards.

9.1.3 Vessels shall be provided with means for directional control of adequate strength and suitable design to enable the heading and direction of travel to be effectively controlled at all operating speeds. When appropriate to the safe steering of the vessel, the steering gear shall be power operated in accordance with the requirements of the BMA.

9.1.4 When the steering gear is fitted with remote control, arrangements shall be made for emergency steering in the event of a failure of such control.

9.1.5 The emergency steering position shall be fitted with:

.1 the angular position of the rudder; and
.2 heading indication

9.2 Additional Equivalence Considerations

9.2.1 None

9.3 Alternative Design and Arrangements

9.3.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

PART B – VESSELS OF 500 GT AND ABOVE

9.4 General Requirements

9.4.1 For existing and new vessels, the steering gear and its installation shall meet the standards of SOLAS II-1/Part C - Machinery installations for cargo vessels, so far as it is reasonable and practicable to do so.

9.4.2 In any case, the intention shall be to achieve a standard of safety which is at least equivalent to the standard of SOLAS. Equivalence may be achieved by incorporating increased requirements to balance deficiencies and thereby achieve the required overall standard.

9.4 Additional Equivalence Considerations

9.4.1 None

9.4 Alternative Design and Arrangements

9.4.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

10 BILGE PUMPING ARRANGEMENTS

PART A – VESSELS OF LESS THAN 500 GT

10.1 General Requirements

10.1.1 The bilge pumping equipment and its installation shall, in general, meet the requirements of a Recognised Organisation. Either the vessel shall be in Class or a statement of compliance issued by one of the Societies should be provided to the BMA.

10.1.2 In the event that 10.1.1 cannot be met on an existing vessel, The BMA may be requested to consider alternative arrangements to achieve adequate safety standards.

10.1.3 All vessels shall be provided with at least two fixed and independently powered pumps, with suction pipes so arranged that any compartment can be effectively drained when the vessel is heeled to an angle of 10°. For Short Range Yachts, the second pump and suction pipes may be portable.

10.1.4 The location of pumps required by 10.1.3, their individual power supplies and controls, including those for bilge valves, shall be such that in event of any one compartment being flooded at least one of those pumps is capable of removing water from the flooded space and adjacent compartments and discharging this via a dedicated discharge overboard.

10.1.5 Each bilge pump suction line shall be fitted with an efficient strum box.

10.1.6 In the case of a vessel where the propulsion machinery space may be unmanned at any time, a bilge level alarm shall be fitted. The alarm shall provide an audible and visual warning in the Master's cabin and in the wheelhouse. The audible and visual alarm may be accepted elsewhere if it is considered that such a location may be more appropriate.

10.1.7 Pumping and piping arrangements for bilges into which fuel or other oils of similar or higher fire risk could collect, under either normal or fault conditions, shall not contravene MARPOL requirements. Bilge level alarms meeting the requirements of 10.1.6 shall be fitted to all such bilges.

10.2 Additional Equivalence Considerations

10.2.1 None

10.3 Alternative Design and Arrangements

10.3.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

PART B – VESSELS OF 500 GT AND ABOVE

10.4 General Requirements

10.4.1 For all vessels, the bilge pumping and its installation shall as a minimum meet the cargo vessel standards of SOLAS II-1/Part B - Bilge pumping arrangements Regulation 35-1.

10.4.2 A minimum of two bilge pumps shall be provided. The capacity of the pumps and the size of the bilge main and branches shall meet the capacity requirements for passenger ships contained in SOLAS.

10.4.3 In addition, the minimum requirements for vessels of less than 500GT contained in Section 10 Part A, shall also be met.

10.5 Additional Equivalence Considerations

10.5.1 None

10.6 Alternative Design and Arrangements

10.6.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

11 STABILITY

11.1 General

11.1.1 This section deals with the standards for both intact and damaged stability.

11.1.2 An intact stability standard proposed for assessment of a vessel type not covered by the standards defined in the Code shall be submitted to a Recognised Organisation or the BMA for approval at the earliest opportunity.

11.1.3 If used, permanent ballast should be located in accordance with a plan approved by the BMA and in a manner that prevents shifting of position. Permanent ballast should not be removed from the yacht or relocated within the yacht without the approval of the BMA. Permanent ballast particulars should be noted in the yacht's stability booklet. Attention should be paid to local or global hull strength requirements from the fitting of additional ballast.

11.1.4 For the purpose of assessing whether the stability criteria are met, GZ curves shall be produced for the loading conditions applicable to the operation of the vessel.

11.2 Intact Stability Standards

11.2.1 *Motor Monohull Vessels:*

11.2.1.1 The curves of static stability for seagoing conditions shall meet the following criteria:

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

.4 the maximum GZ shall occur at an angle of heel of preferably exceeding 30° but not less than 25°;

.5 after correction for free surface effects, the initial metacentric height (GM) shall not be less than 0.15 metres; and

.6 in the event that the vessels intact stability standard fails to comply with the criteria defined in (i) to (v) the BMA may be consulted for the purpose of specifying alternative but equivalent criteria.

11.2.2 *Motor Monohull Vessels operating as Short Range Yachts:*

11.2.2.1 Where Short Range Yachts are unable to meet the criteria above, the following criteria may be used:

.1 the area under the righting lever curve (GZ curve) shall not be less than 0.07 metre-radians up to 15° angle of heel, when maximum GZ occurs at 15°, and 0.055 metre-radians up to 30° angle of heel, when maximum GZ occurs at 30° or above. Where the maximum GZ occurs at angles of between 15° and 30°, the corresponding area under the GZ curve, Areq shall be taken as follows:

$$A_{REQ} = 0.055 + 0.001\ (30° - \theta_{max})\ \text{metre-radians}$$

where

θ_{max} is the angle of heel, in degrees, where the GZ curve reaches its maximum;

.2 the area under the GZ curve between the angles of heel of 30° and 40° or between 30° and the angle of downflooding if this is less than 40°, shall not be 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°;

.4 the maximum GZ shall occur at an angle of heel not less than 15°;

.5 after correction for free surface effects, the initial metacentric height (GM) shall not be less than 0.15 metres.

11.2.3 *Motor Multi-hull Vessels*

11.2.3.1 The curves of static stability for seagoing conditions shall meet the following criteria:

.1 the area under the righting lever curve (GZ curve) shall not be less than 0.075 metre-radians up to an angle of 20° when the maximum righting lever (GZ) occurs at 20° and, not less than 0.055 metre-radians up to an angle of 30° when the maximum righting lever (GZ) occurs at 30° or above. When the maximum GZ occurs at angles between 20° and 30° the corresponding area under the GZ curve, Areq shall be taken as follows:-

$$A_{req} = 0.055 + 0.002\ (300 - \theta_{max})\ \text{metre-radians}$$

where

θ_{max} is the angle of heel, in degrees, where the GZ curve reaches its maximum;

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

.3 the righting lever (GZ) shall be at least 0.20 metres at an angle of heel where it reaches its maximum;

.4 the maximum GZ shall occur at an angle of heel not less than 20°;

.5 after correction for free surface effects, the initial metacentric height (GM) shall not be less than 0.15 metres; and

.6 if the maximum righting lever (GZ) occurs at an angle of less than 20° approval of the stability shall be considered by the BMA as a special case.

11.2.4 For the purpose of assessing whether the stability criteria are met, GZ curves should be produced for the loading conditions applicable to the operation of the vessel.

11.2.5 *Superstructures:*

11.2.5.1 The buoyancy of enclosed superstructures complying with regulation 3(10)(b) of the ICLL may be taken into account when producing GZ curves.

11.2.5.2 Superstructures, the doors of which do not comply with the requirements of regulation 12 of ICLL, are considered exposed superstructures and shall not be taken into account.

11.2.6 *Motor High Speed Vessels:*

11.2.6.1 In addition to the criteria above designers and builders shall address the following hazards which are known to affect vessels operating in planing modes or those achieving relatively high speeds:

.1 directional instability, often coupled to roll and pitch instabilities;

.2 bow diving of planing vessels due to dynamic loss of longitudinal stability in calm seas;

.3 reduction in transverse stability with increasing speed in monohulls;

.4 porpoising of planing monohulls being coupled with pitch and heave oscillations;

.5 generation of capsizing moments due to immersion of chines in planing monohulls (chine tripping).

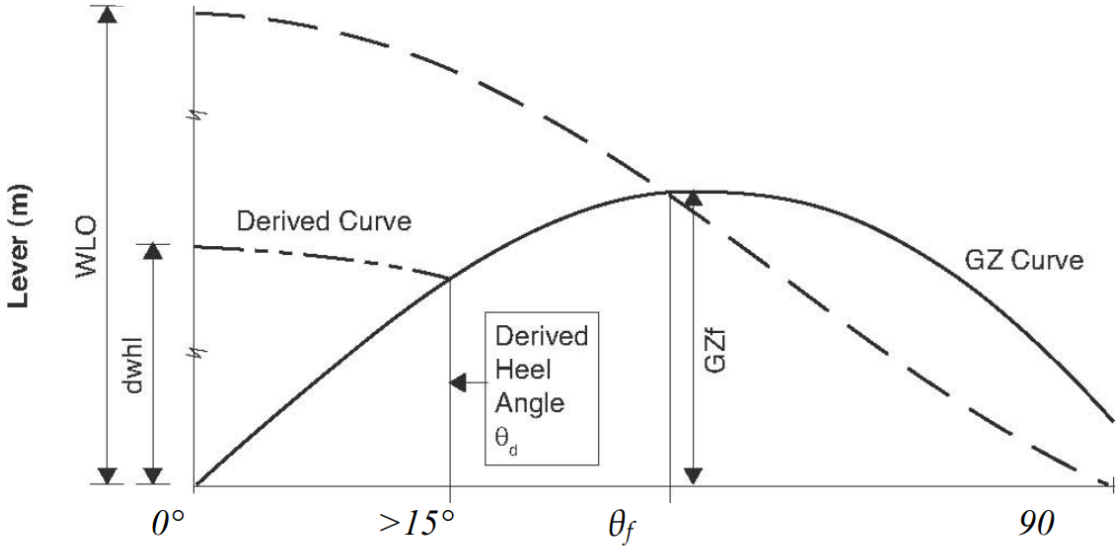
11.2.7 *Sailing Monohull Vessels*

11.2.7.1 Curves of static stability (GZ curves) for at least the Loaded Departure with 100% consumables and the Loaded Arrival with 10% consumables shall be produced.

11.2.7.2 The GZ curves required by 11.2.7.1 shall have a positive range of not less than 90°. For vessels of more than 45m, a range of less than 90° may be considered but may be subject to agreed operational criteria.

11.2.7.3 In addition to the requirements of 11.2.7.2, the angle of steady heel should be greater than 15° (see figure). The angle of steady heel is obtained from the

intersection of a "derived wind heeling lever" curve with the GZ curve required by 11.2.7.1.



Where

dwhl = the derived wind heeling lever at any angle θ^o = 0.5 x WLO x $Cos^{1.3}\theta$

and

$$WLO = \frac{GZ_f}{Cos^{1.3}\theta_f}$$

Noting that:

$WLO =$ *is the magnitude of the actual wind heeling lever at 0º which would cause the vessel to heel to the downflooding angle* θ_f *or 60º, whichever is least.*

$GZ_f =$ *is the lever of the vessel's GZ at the downflooding angle* θ_f *or 60º, whichever is least.*

$\theta_d =$ *is the angle at which derived wind heeling curve intersects the GZ curve. (If* θ_d *is less than 15º the vessel shall be considered as having insufficient stability for the purpose of the Code)*

$\theta_f =$ *the downflooding angle is the angle of heel causing immersion of the lower edge of openings having an aggregate area, in square metres, greater than:*

$\frac{\Delta}{1500} =$ *where* Δ *= vessel displacement in tonnes*

11.2.7.4 All regularly used openings for 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°. Air pipes to tanks can, however, be disregarded.

11.2.7.5 If, as a result of immersion of openings in a superstructure, a vessel cannot meet the required standard, those superstructure 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 superstructure.

11.2.7.6 It might be noted that provided the vessel complies with the requirements of 11.2.7.1 to 11.2.7.3 and 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°.

11.2.8 *Sailing Multi-hull Vessels*

11.2.8.1 Curves of static stability in both roll and pitch shall be prepared for at least the Loaded Arrival with 10% consumables. The VCG shall be obtained by one of the three methods listed below:

.1 inclining of complete craft in air on load cells, the VCG being calculated from the moments generated by the measured forces; or

.2 separate determination of weights of hull and rig (comprising masts and all running and standing rigging), and subsequent calculation assuming that the hull VCG is 75% of the hull depth above the bottom of the canoe body, and that the VCG of the rig is at half the length of the mast (or a weighted mean of the lengths of more than one mast); or

.3 a detailed calculation of the weight and CG position of all components of the vessel, plus a 15% margin of the resulting VCG height above the underside of canoe body.

11.2.8.2 If naval architecture software is used to obtain a curve of pitch restoring moments, then the trim angle shall be found for a series of longitudinal centre of gravity (LCG) positions forward of that necessary for the Design Waterline. The curve can then be derived as follows:

$$\text{GZ in pitch} = \text{CG' x cos (trim angle)}$$

$$\text{trim angle} = tan^{-1}\left(\frac{T_{FP} - T_{AP}}{L_{BP}}\right)$$

where: CG'= shift of LCG forward of that required for design trim, measured parallel to baseline

T_{FP}= draught at forward perpendicular

T_{AP}= draught at aft perpendicular

L_{BP}= length between perpendiculars

(Approximations to maximum roll or pitch moments are not acceptable)

11.2.8.3 Data shall be provided to the user showing the maximum advised mean apparent wind speed appropriate to each combination of sails, such wind speeds being calculated as the lesser of the following:

$$v_w = \sqrt[1.5]{\frac{LM_R}{A'_s \mathrm{h} \cos \varphi_R + A_D b}}$$

or

$$v_w = \sqrt[1.5]{\frac{LM_P}{A'_s \mathrm{h} \cos \varphi_P + A_D b}}$$

where

$v_w =$ maximum advised apparent wind speed (knots)
$LM_R =$ maximum restoring moment in roll (N.m)
$LM_P =$ limiting restoring moment in pitch (N.m), defined as the pitch restoring moment at the least angle of the following:

i. angle of maximum pitch restoring moment;
ii. angle at which foredeck is immersed; or
iii. 10° from design trim

$A'_s =$ area of sails set including mast and boom (square metres)
$\mathrm{h} =$ height of combined centre of effort of sails and spars above the waterline
$\varphi_R =$ heel angle at maximum roll righting moment (in conjunction with LM_R)
$\varphi_P =$ heel angle at maximum roll righting moment (in conjunction with LM_P)
$A_D =$ plan area of the hulls and deck (square metres)
$\mathrm{b} =$ distance from centroid of A_D to the centreline of the leeward hull

This data shall be accompanied by the note:

In following winds, the tabulated safe wind speed for each sail combination shall be reduced by the boat speed

11.2.8.4 If the maximum safe wind speed under full fore-and-aft sail is less than 27 knots, it shall be demonstrated by calculation using annex D of ISO 12217-2 (2002) that, when inverted and/or fully flooded, the volume of buoyancy, expressed in cubic metres (m^3), in the hull, fittings and equipment is greater than:

1.2 x (fully loaded mass in tonnes)

thus ensuring that it is sufficient to support the mass of the fully loaded vessel by a margin. Allowance for trapped bubbles of air (apart from dedicated air tanks and watertight compartments) shall not be included.

11.2.8.5 The maximum safe wind speed with no sails set calculated in accordance with 11.2.8.3 shall exceed 36 knots. For Short Range Yachts this wind speed shall exceed 32 knots.

11.2.8.6 Trimarans used for unrestricted operations shall have sidehulls each having a total buoyant volume of at least 150% of the displacement volume in the fully loaded condition.

11.2.8.7 The stability information booklet shall include information and guidance on:

.1 the stability hazards to which these craft are vulnerable, including the risk of capsize in roll and/or pitch;

.2 the importance of complying with the maximum advised apparent wind speed information supplied;

.3 the need to reduce the tabulated safe wind speeds by the vessel speed in following winds;

.4 the choice of sails shall be set with respect to the prevailing wind strength, relative wind direction, and sea state;

.5 the precautions shall be taken when altering course from a following to a beam wind.

11.2.8.8 In vessels required to demonstrate the ability to float after inversion (according to 11.2.8.4 above), an emergency escape hatch shall be fitted to each main inhabited watertight compartment such that it is above both upright and inverted waterlines.

11.3 Damage Stability

11.3.1 The following requirements are applicable to all vessels, other than those operating as Short Range Yachts. Whilst Short Range Yachts are not required to meet the damage stability criteria defined below, it is recommended that they meet the requirements where practicable.

11.3.2 It should be noted that compliance with the damage stability criteria is not required for vessels that obtain full compliance with the ICLL conditions of assignment.

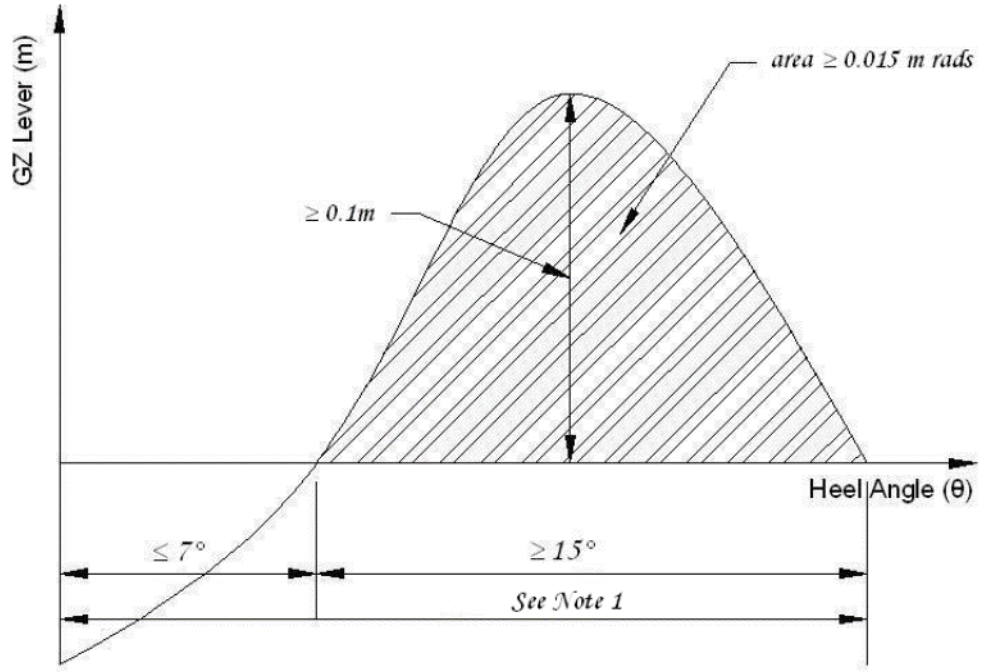
11.3.3 The watertight bulkheads of the vessel shall be so arranged that minor hull damage that results in the free flooding of any one compartment will cause the vessel to float at a waterline which, at any point, is not less than 75 millimetres below the weather deck, freeboard deck, or bulkhead deck if not concurrent.

11.3.4 Minor damage shall be assumed to occur anywhere in the length of the vessel, but not on a watertight bulkhead.

11.3.5 Standard permeabilities shall be used in this assessment, as follows:

Space	Percentage Permeability
Stores	60
Stores but not a substantial quantity thereof	95
Accommodation	95
Machinery	85

11.3.6 In the damaged condition considered in section 11.3.3, the residual stability shall be such that any angle of equilibrium does not exceed 7° from the upright, the resulting righting lever curve has a range to the downflooding angle of at least 15° beyond any angle of equilibrium, the maximum righting lever within that range is not less than 100 millimetres and the area under the curve is not less than 0.015 metre-radians.



Notes:

.1 Range of stability in "damaged" condition shall have regard, where appropriate, to truncation due to downflooding.

.2 The required properties of the "damaged" GZ curve, namely max.GZ≥ 0.1m and the area under the curve of ≥0.015metre radians. shall be

achieved within the positive range of the curve taking into account any restrictions imposed by Note 1.

11.3.7 A vessel of 85 metres and above shall meet a SOLAS 90 passenger ship one-compartment standard of subdivision, calculated using the deterministic damage stability methodology.

11.4 Elements of Stability

11.4.1 Unless otherwise specified, the lightship weight, vertical centre of gravity (KG) and longitudinal centre of gravity (LCG) of a vessel should be determined from the results of an inclining experiment.

11.4.2 An inclining experiment should be conducted in accordance with a detailed standard which is approved by the BMA and, in the presence of an authorised surveyor.

11.4.3 The report of the inclining experiment and the lightship particulars derived should be approved by The BMA prior to its use in stability calculations.

11.4.3.1 At the discretion of the Company and prior to approval of the lightship particulars by the BMA, a margin for safety may be applied to the lightship weight and KG calculated after the inclining experiment. Such a margin shall be clearly identified and recorded in the stability booklet.

11.4.3.2 A formal record shall be kept in the stability booklet of alterations or modifications to the vessel for which the effects on lightship weight and vertical centres of gravity are offset against of the margin.

11.4.4 When sister vessels are built at the same shipyard, the BMA may accept a lightweight check on subsequent vessels to corroborate the results of the inclining experiment conducted on the lead vessel of the class.

11.5 Stability Documents

11.5.1 A vessel shall be provided with a Stability Information Booklet (and Damage Control Plan and Booklet if applicable) for the Master, that shall be approved by the BMA or a Recognised Organisation.

11.5.2 The content, form and presentation of information contained in the stability information booklet shall be based on the model booklet for the vessel type (motor or sailing) published by/for the BMA.

11.5.3 A vessel with previously approved stability information which undergoes a major refit or alterations shall be subjected to a complete reassessment of stability and

provided with newly approved stability information. A major refit or major alteration is one which results in either a change in the lightship weight of 2% and above and/or the longitudinal centre of gravity of 1% and above (measured from the aft perpendicular) and/or the calculated vertical centre of gravity rises by 0.25% and above (measured from the keel).

11.5.4 Unless it can be clearly demonstrated that no major change has occurred, a lightweight check shall be carried out at the renewal survey.

11.5.5 Sailing vessels shall have, readily available, a copy of the "Curves of Maximum Steady Heel Angle to Prevent Downflooding in Squalls", or in the case of a multihull, the values of maximum advised mean apparent windspeed, for the reference of the watchkeeper. This shall be a direct copy taken from that contained in the approved stability booklet.

11.5.6 The overall sail area and spar weights and dimensions shall be as documented in the vessel's stability information booklet. Any rigging modifications that increase the overall sail area, or the weight/dimensions of the rig aloft, shall be accompanied by an approved updating of the stability information booklet.

11.5.7 For Short Range Yachts, where the damage stability has not been assessed, the following note should be added to the approved stability booklet;

This vessel has not been assessed for damage stability and therefore might not remain afloat in the event of damage or flooding.

11.6 Additional Equivalence Considerations

11.6.1 None

12 FREEBOARD

12.1 General

12.1.1 The freeboard for the vessel and its marking shall be approved by the Assigning Authority for the assignment of freeboard and issue of the International Load Line Certificate (1966)[18].

12.1.2 Vessels shall comply with ICLL for the assignment of a freeboard mark which corresponds to the deepest loading condition included in the stability information booklet for the vessel.

12.1.3 The freeboard assigned shall be compatible with the strength of hull structure, intact and damage stability requirements for the vessel, and is to ensure minimum bow height requirements of the International Convention on Load Lines (1966) are met.

12.1.4 The Assigning Authority shall provide the Company with a copy of the particulars of the freeboard assigned and a copy of the record of particulars relating to the conditions of assignment.

12.2 Freeboard Mark and Loading

12.2.1 The freeboard mark applied shall be positioned port and starboard at amidships on the load line length and may be an all-seasons mark. The mark shall be a permanent disc and be of contrasting colour to the hull of the vessel in way of the mark.

12.2.2 The fresh water freeboard allowance shall be obtained by deducting from the all-seasons freeboard assigned, the quantity

$$\frac{\Delta}{4T} \text{ millimetres}$$

Where:

Δ is the displacement in salt water in tonnes at the all-seasons draught
T represents tonnes per centimetres immersion at the all seasons load waterline

Alternatively, the deduction may be taken as 1/48th of the all-seasons draught of the ship at amidships.

[18] For the purpose of Section 12, the 1966 version of the International Convention on Load Lines shall be applied and not as amended

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

12.3 Datum Draught Marks

12.3.1 Datum draught marks shall be provided at the bow and stern, port and starboard, and be adequate for assessing the condition and trim of the vessel. Such draught marks may be single datum lines.

12.3.2 The marks shall be permanent and easily read but need not be of contrasting colour to the hull. The marks need not indicate more than one draught at each position and shall be above, but within 1000 mm, of the deepest load waterline.

12.3.3 The draught to which marks relate shall be indicated either above the mark on the hull and/or in the stability information booklet for the vessel. The position of the marks shall be verified at initial placement by the BMA or the vessel's Assigning Authority.

12.4 Additional Equivalence Consideration

12.4.1 None

13 LIFE-SAVING APPLIANCES

13.1 General Requirements

13.1.1 Life-Saving Appliances shall be provided in accordance with Table 13.1 - Life-Saving Appliances.

13.1.2 All equipment fitted shall be of a type which has been accepted by the BMA as complying with LSA Code and IMO Resolution MSC.81(70)[19].

13.1.3 Additional life-saving equipment which is provided shall meet the requirements of 13.1.2.

13.1.4 When personal safety equipment is provided for use in water sports activities, arrangements for its stowage shall ensure that it shall not be used mistakenly as lifesaving equipment in an emergency situation.

13.1.5 All life-saving equipment carried shall be fitted with retro-reflective material in accordance with the recommendations of IMO Resolution A.658(16), as amended.

13.1.6 Liferaft embarkation arrangements shall comply with the following:

.1 Where the distance between the embarkation deck and the top of the liferaft buoyancy tube exceeds 1 metre with the vessel in its lightest condition, an embarkation ladder shall be provided. A means for fastening shall be provided and ladders shall be readily available for use at all times.

.2 Where the distance between the embarkation deck and the top of the liferaft buoyancy tube exceeds 4.5 metres with the vessel in its lightest condition, davit launched liferafts and at least one launching appliance for launching shall be provided on each side of the vessel.

13.1.7 Falls for launching devices are to comply with the LSA Code. When falls are of stainless steel, they shall be renewed at intervals not exceeding the service life recommended by the manufacturer, or where no service life is stated be treated as galvanised steel falls. Falls of alternative materials may be considered by the BMA on a case by case basis.

13.1.8 Every inflatable lifejacket, inflatable liferaft, marine evacuation system and hydrostatic release unit other than a disposable hydrostatic release unit shall be

[19] See also BMA Information Bulletin No.71

serviced, at intervals not exceeding 12 months unless extended service intervals have been approved by the BMA, at a manufacturer's approved service station.

13.1.9 All repairs and maintenance of permanently inflated rescue boats shall be carried out in accordance with the manufacturers' instructions; emergency repairs may be carried out onboard; however, permanent repairs shall be effected at an approved servicing station.

13.1.10 Maintenance of equipment shall be carried out in accordance with the instructions for onboard maintenance.

13.1.11 The stowage and installation of all life-saving appliances shall be to the satisfaction of the BMA.

13.1.12 All life-saving appliances shall be in working order and be ready for immediate use at the commencement of, and at all times during, the voyage.

13.1.13 For a vessel equipped with stabiliser fins or having other projections at the sides of the hull, special consideration shall be given, and provisions made, as necessary to avoid possible interference with the safe evacuation of the vessel in an emergency.

13.1.14 Means shall be provided to prevent overboard discharge of water into survival craft.

13.1.15 In addition to or in conjunction with the servicing intervals of marine evacuation systems required by Section 13.1.8, each marine evacuation system shall be deployed[20] from the ship on a rotational basis at intervals to be agreed by the BMA, provided that each system shall be deployed at least once every six years.

13.1.16 All survival craft required to provide for abandonment by the total number of persons onboard shall be capable of being launched with their full complement of persons and equipment within a period of 30 minutes from the time the abandon ship signal is given and after all persons have been assembled, with lifejackets donned. Life-Saving Appliances should be provided in accordance with table 1 - Life-Saving Appliances.

[20] Results of MES rotational deployments shall be reported to the BMA in accordance with BMA Information Bulletin No.174

VESSEL SIZE	Short Range Yacht	≥24m	≥500GT	≥85m
LIFEBOATS (see 13.2)	-	-	-	YES
LIFERAFTS (see 13.3)	YES	YES	YES	YES
MAN OVERBOARD RECOVERY SYSTEM (see 13.2.3.3)	YES	-	-	-
RESCUE BOAT (see 13.2.3)	-	YES	YES	YES
LIFEJACKETS (see 13.2.4)	YES	YES	YES	YES
IMMERSION SUITS (see 13.2.5)	YES	YES	YES	YES
LIFEBUOYS (TOTAL)	4	4	8	8
LIFEBUOYS WITH LIGHT AND SMOKE (see 13.2.6.1)	2	2	2	2
LIFEBUOYS WITH LIGHT	-	-	2	2
LIFEBUOYS WITH BUOYANT LIFELINE (see 13.2.6.2)	2	2	2	2
SET OF LINE THROWING APPLIANCES (4 lines plus 4 charges)	1	1	1	1
ROCKET PARACHUTE FLARES	6	6	12	12
TWO-WAY RADIOTELEPHONE SETS	2	2	2	3
EPIRB (see 13.2.7)	1	1	1	1
SART (see 13.2.8)	1	1	2	2
GENERAL ALARM (see 13.2.9)	YES	YES	YES	YES
LIGHTING (see13.2.10)	YES	YES	YES	YES
POSTERS AND SIGNS SHOWING SURVIVAL CRAFT AND EQUIPMENT OPERATING INSTRUCTIONS	YES	YES	YES	YES
TRAINING MANUAL	YES	YES	YES	YES
INSTRUCTIONS FOR ONBOARD MAINTENANCE	YES	YES	YES	YES
LIFESAVING SIGNALS AND RESCUE POSTER - SOLAS No 1 IN WHEELHOUSE (see 13.2.11)	YES	YES	YES	YES

Table 13.1 - LIFE-SAVING APPLIANCES

13.2 Lifeboats (Required for Vessels over 85 metres in length)

13.2.1 When lifeboats are required to be carried their acceptance is conditional upon the provision of suitable stowage and launching arrangements.

13.2.2 When lifeboats are provided on each side of the vessel, the lifeboat(s) on each side shall be of capacity to accommodate the total number of persons onboard.

13.2.3 Alternative arrangements to the carriage of lifeboats may be considered as indicated below:

.1 substitution of lifeboats by liferafts where the vessel complies with a SOLAS two compartment subdivision standard; or

.2 substitution of lifeboats by a sufficient number of davit launched liferafts such that in the event of any one liferaft being lost or rendered unserviceable, sufficient aggregate capacity remains on either side of the vessel for all persons on board. Additionally, one approved rescue boat should be provided on each side of the vessel.

.3 substitution of lifeboats by a sufficient number of marine evacuation systems (MES) in accordance with 13.15, such that in the event of any one MES being lost or rendered unserviceable:

i. Sufficient aggregate capacity of liferafts remains on either side of the vessel for all persons onboard;

ii. An alternative means of evacuating passengers and crew into survival craft on the same side of the craft in conditions up to and including those in 13.15(3)(a) shall be provided, such as an embarkation ladder; and

iii. Additionally, one approved rescue boat shall be provided on each side of the vessel capable of marshalling liferafts and towing the largest liferaft carried onboard.

13.2.4 A lifeboat will be acceptable as a rescue boat provided it also meets the requirements of IMO Lifesaving Appliances Code as a rescue boat.

13.3 Liferafts

13.3.1 The liferafts carried shall be stowed in GRP containers and shall contain the necessary "emergency pack":

.1 For Short Range Yachts, or vessels operating within 90 miles from a safe haven, liferafts provided may be equipped with a "SOLAS B Pack".

.2 For all other vessels, liferafts shall be equipped with a "SOLAS A Pack".

13.3.2 Liferaft approval includes approval of their stowage, launching and float-free arrangements.

13.3.3 Every liferaft shall be stowed with its painter permanently attached to the ship, following the original equipment manufacturer's instructions.

13.3.4 For vessels of less than 85 m in length, or those complying with section 13.2.3, a sufficient number of liferafts shall be provided so that in the event of any one liferaft being lost or rendered unserviceable, sufficient aggregate capacity remains on either side of the vessel for all persons on board. This may be achieved by transferring liferafts from one side to the other. Where liferafts are transferable, this requirement may be met by the ability of the rafts to be transferred within 5 minutes, as below:

.1 Liferafts of 6 - 15 persons capacity to be carried by 2 persons

.2 Liferafts of more than 15 persons capacity to be carried by 4 persons

13.3.5 When lifeboats are provided in accordance with section 13.2.2, sufficient liferafts are to be provided such that in the event of any one lifeboat being lost or rendered unserviceable, sufficient aggregate liferaft capacity remains on either side of the vessel for all persons onboard. Where liferafts are transferable, this requirement may be met by the ability of the rafts to be transferred within 5 minutes, as detailed in section 13.3.4.

13.3.6 GRP containers containing liferafts should be stowed on the weather deck or in an open space and fitted with hydrostatic release units so that the liferafts will float free of the vessel and automatically inflate. Where rafts are stowed under covers or hatches, such arrangements shall:

.1 not impair the liferafts floating free;

.2 provide access for inspection and launching;

.3 allow for the crew to undertake safety drills; and

.4 ensure the free flooding of all liferaft storage compartments.

13.3.7 For vessels operating with reduced personnel aboard, attention is drawn to the dangers associated with the use of large capacity liferafts with small numbers of persons embarked.

13.3.8 For vessels of 500GT and above, the muster station(s) shall be accessible via the open deck or a continuous fire shelter.

13.4 Rescue Boats

13.4.1 General Requirements

.1 Means shall be provided for the recovery of a person from the sea to the vessel and it shall be assumed that the person is unconscious or unable to assist in the rescue. This requirement is satisfied by the following sections as appropriate to the size of the vessel. If an overside

boarding ladder or scrambling net is provided the ladder or net shall extend from the weather deck to at least 600 millimetres below the lowest operational waterline.

.2 All rescue boats covered within this section shall be equipped to the requirements of the LSA Code Chapter V/5.1.2. Additionally, rescue boats need not be capable of being launched on both sides of the vessel but shall be capable of being launched under unfavourable conditions of trim of up to 10° and list of up to 20° either way and means to lower the boat from within the boat is not required.

.3 Launching stations shall be in such positions as to ensure safe launching having particular regard to clearance from the propeller and steeply overhanging portions of the hull and so that, as far as possible, the rescue boat can be launched down the straight side of the ship whilst maintaining minimum speed to keep a course.

.4 If stowed forward the launching appliance and rescue boat shall be entirely located in a sheltered position abaft the vertical extension of the aft most portion of the collision bulkhead.

.5 Rescue boats shall be stowed in a state of continuous readiness for launching in not more than 5 minutes, and if the inflated type, in a fully inflated condition at all times.

.6 Rescue boats shall have sufficient mobility and manoeuvrability in a seaway to enable persons to be retrieved from the water, marshal liferafts and tow the largest liferaft carried on the ship when loaded with its full complement of persons and equipment or its equivalent at a speed of at least 2 knots.

13.4.2 Vessels of 500GT and above

.1 All vessels of 500GT and above shall be provided with a rescue boat approved in accordance with the LSA Code in all respects, except for the colour. If the rescue boat or boats are not a highly visible colour, covers or patches of a highly visible colour equalling at least 1m^2 in area, divided up into no more than 2 parts, shall be able to be displayed on the rescue boat. If a patch(es) is used, it shall be capable of being attached to the top of the rescue boat (e.g. on the tubes).

.2 The launching appliances shall comply and be approved in accordance with the LSA Code except that when a power operated crane is fitted, it shall be capable of operation either by hand or by an emergency source of power in the event of a main power failure. The routing of the emergency source of power shall be considered in respect of damaged waterlines and fire.

.3 The launching appliances shall be sized for the maximum approved launching weight of the rescue boat loaded with its full complement of persons and equipment.

13.4.3 Vessels under 500GT

.1 Vessels under 500GT shall be provided with a rescue boat either:

i. meeting the requirements of 13.4.2; or

ii. a boat which is not approved in accordance with the LSA Code but which is suitable for rescue purposes. The boat may be rigid, rigid inflated, or inflated, and shall have a capacity for not less than 4 persons, one of which shall be assumed to be lying down. Tubes of rigid inflatable or inflatable boats shall have a minimum of 3 buoyancy compartments. The boat shall be capable of displaying a highly visible colour. If the equipment as required is stowed in a grab bag, it may be stowed in the boat or in an easily accessible location close to the rescue boat.

.2 Launching appliances shall be approved in accordance with LSA Code, approved to a recognised national or international standard acceptable to the BMA, or comply with the following requirements:

i. When a power operated device is fitted, it shall be capable of operation either by hand or by an emergency source of power in the event of a main power failure. The routing of the emergency source of power shall be considered in respect of damaged waterlines and fire;

ii. The launching appliance and its attachments shall be constructed to withstand a static proof load on test of not less than 2.2 times the maximum working load. Acceptable factors of safety are 6 for wires, hooks and sheaves, and 4.5 for the remainder of the launching appliance. The appliance and its attachments shall also be tested dynamically to 1.1 times the working load. It shall be noted that there is no requirement to recover the rescue boat provided that the casualty and the boat's crew can be recovered onboard from the boat in the water;

iii. The design of the falls and winch system shall take account of the principles of LSA Code Ch VI/6.1.2.

.3 Launching appliances shall be marked as "**NOT SUITABLE FOR MAN-RIDING**", unless they comply with the following:

i. Have an automatic brake such that it shall not lower without continuous positive intervention from the crew;

ii. Be provided with original approved manufacturers certification or that from a Recognised Organisation stating that it is suitable for man-riding with a fully loaded rescue boat of persons and equipment;

iii. The use be risk assessed in accordance with Section 23 Part A.

.4 Where it is proposed to use the running rigging on sailing vessels as a launching appliance, the above requirements shall also be met.

.5 With the exception of tender poles and davits of similarly simple design (such as slot-in portable davits), man-riding launching appliances shall be serviced in accordance with IMO MSC.1/Circ.1206/Rev.1, except that the Service Providers carrying out the thorough examination and operational testing shall be one of the following;

i. a manufacturer (or their approved agents) of similar SOLAS approved equipment;
ii. a manufacturer (or their approved agents) of approved marine lifting appliances; or
iii. a recognised lifting appliance testing company. Such companies shall be approved by a Recognised Organisation or a National Government acceptable to the BMA
iv. tests conducted by i. to iii. need not be witnessed by a third party.

.6 Tender poles and davits of similarly simple design (such as slot-in portable davits) used for man-riding, shall be inspected annually by a competent person. Five-yearly load testing (dynamic at 1.1 x MWL) shall be completed by a competent shore-based organisation as far as is reasonable and practical.

.7 Launching appliances not used for man-riding shall be serviced in accordance with the manufacturer's instructions and BMA requirements. Short Range Yachts.

13.4.4 Vessels operating as Short Range Yachts shall either comply with requirements of 13.4.2 or 13.4.3 or the following:

.1 The vessel shall have sufficient mobility and manoeuvrability in a seaway to enable persons to be retrieved from the water. For assessing this ability, it is not considered acceptable to retrieve persons over the stern of the vessel or adjacent to the propeller(s). The recovery location shall be visible from the conning position at all times during the recovery, although this may be achieved by the use of remote controls where necessary; and

.2 The vessel shall be provided with suitable equipment and/or arrangements to enable the person(s) to be recovered without further persons entering the water.

13.5 Lifejackets

13.5.1 One adult lifejacket shall be provided for each person onboard plus spare adult lifejackets sufficient for at least 10% of the total number of persons onboard or two, whichever is the greater. Each lifejacket shall be fitted with a light and whistle.

13.5.2 If the adult lifejackets provided are not designed to fit persons weighing up to 140kg and with a chest girth of up to 1,750 millimetres, a sufficient number of suitable accessories as may be required to provide a lifejacket for each such person shall be available onboard to allow them to be secured to such persons.

13.5.3 Included in the above number of lifejackets, there shall be at least two inflatable lifejackets for use of the crew of any rescue boat or inflatable boat carried onboard.

13.5.4 One child lifejacket or infant lifejacket shall be provided for each child or infant onboard.

13.6 Immersion Suits

13.6.1 One approved immersion suit of an appropriate size shall be provided for each person onboard, these may be of the non-insulated type. These immersion suits need not be required if the ship is constantly engaged on voyages in warm climates where, in the opinion of the BMA, immersion suits are unnecessary[21].

13.6.2 Due consideration shall be given to the provision of appropriate immersion/thermal protection for children and infants carried onboard.

13.6.3 For cold water areas of operation, the insulated type shall be carried. Reference to Resolution IMO MSC/Circ.1046 shall be made for assessment of thermal protection[22].

13.7 Lifebuoys

13.7.1 Lifebuoys port and starboard provided with combined self-igniting light and self-activating smoke signals shall be capable of quick deployment from the navigating bridge.

13.7.2 The attached buoyant lifeline required on each of two of the lifebuoys is to have a minimum length of 30 metres.

13.7.3 Each lifebuoy shall be marked with the vessel's name and Port of Registry.

13.8 EPIRB

13.8.1 An approved EPIRB shall be installed in an easily accessible position ready to be manually released, capable of being placed in a survival craft and floating free if the vessel sinks.

[21] Refer to BMA Information Bulletin No.76
[22] Refer to the Guidelines for Assessment of Thermal Protection (MSC/Circ.1046).

13.8.2 EPIRBs shall be tested annually and serviced at not more than five yearly intervals by an approved shore based maintainer.

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

13.9 Radar Transponders (SART)

13.9.1 The SART shall be stowed in an easily accessible position so that it can rapidly be placed in any survival craft. Means shall be provided in order that it can be mounted in the survival craft at a height of at least 1 metre above sea level.

13.10 General Alarm

13.10.1 For a vessel of less than 500GT this alarm may consist of the ship's whistle or siren providing it can be heard in all parts of the vessel.

13.10.2 For a vessel of 500GT and above the requirement of 13.10(1) shall be supplemented by an electrically operated bell or Klaxon system, which shall be powered from the vessel's main supply and also the emergency source of power (see Section 8, Part B).

13.10.3 For a vessel of 85 metres in length and above, in addition to the requirements of 13.10.2 a public address system or other suitable means of communication shall be provided.

13.11 Lighting

13.11.1 Alleyways, internal and external stairways, and exits giving access to, and including, the muster and embarkation stations shall be adequately lit. (See also Section 8).

13.11.2 Adequate lighting shall be provided in the vicinity of survival craft, launching appliance(s) (when provided) and the overside area of sea in way of the launching position(s). The lighting shall be supplied from the emergency source of power.

13.12 Life-saving Signals and Rescue Poster

13.12.1 When display space in the wheelhouse is restricted, the 2 sides of a SOLAS No.2 poster (as contained in liferaft equipment packs) may be displayed in lieu of a SOLAS No. 1 poster.

13.13 Launching Appliances for Vessels Complying with 13.2.3.2

13.13.1 Davit launched liferafts shall be capable of being launched under unfavourable conditions of trim of up to 10° and list of up to 20° either way.

13.13.2 The launching appliances shall comply and be approved in accordance with the LSA Code except, it shall be capable of operation either by hand or by an emergency source of power in the event of a main power failure. The routing of the emergency source of power shall be considered in respect of damaged waterlines and fire.

13.14 Recovery of Persons from the Water

13.14.1 All ships shall have ship-specific plans and procedures for recovery of persons from the water, taking into account the guidelines developed by the IMO[23]. The plans and procedures shall identify the equipment intended to be used for recovery purposes and measures to be taken to minimise the risk to shipboard personnel involved in recovery operations.

13.15 Marine Evacuation Systems (MES)

13.15.1 Where Marine Evacuation Systems (MES) are intended to be utilised as either the sole or supplementary means of abandonment in accordance with 13.2.3.3, all such systems shall be of an approved type in compliance with the LSA Code and comply with the following requirements:

.1 Due consideration shall be given to the location and protection of MES stowage arrangements with respect to protection against fire. Such locations shall be treated as Category (5) Spaces for the purpose of Structural Fire Protection, Detection and Extinction.

.2 The MES embarkation station shall not be higher than the bulkhead deck.

.3 Powered hatches and doors that are required to be opened prior to MES deployment shall:

i. be provided with both main and a local source of emergency power and capable of manual operation; and

ii. have the time to operate included in the timed evacuation analysis as described under IMO Resolution MSC.81(70) Part 1 Section 12.6.1 and in accordance with 13.1.16.

.4 At least one suitably sized inflatable slide or chute as applicable shall be provided on either side of the vessel. Where the installation results in the slide or chute coming into direct contact with the hull shell under any of the conditions listed section 13.15.3.2 below, the side shell shall be locally insulated to A-60. The extent of insulation to be provided shall be sufficient to cover at least +/- 10 degrees of longitudinal trim in way of the applicable areas.

[23] Refer to the Guidelines for the development of plans and procedures for recovery of persons from the water (MSC.1/Circ.1447).

13.15.2 Stowage of Marine Evacuation Systems

.1 The ship's side shall not have any openings (including scuppers and overboard discharges) between the Embarkation Station of the Marine Evacuation System and the waterline in the lightest seagoing condition. Means shall be provided to protect the system from any projections including but not limited to fin stabilisers.

.2 Where glazed openings are located in the ship's side between the Embarkation Station of the Marine Evacuation System and the waterline in the lightest seagoing condition, they shall be A-0, unless the side shell in which they are located is required to be of a higher fire rating in accordance with 13.15.1.4.

.3 Marine Evacuation Systems shall be in such positions as to ensure safe launching having particular regard to clearance from the propeller and steeply overhanging portions of the hull and so that, as far as practicable, the system can be launched down the straight side of the Yacht.

.4 Each Marine Evacuation System shall be stowed so that neither the passage nor platform nor its stowage or operational arrangements shall interfere with the operation of any other life-saving appliance at any other launching station.

.5 Where appropriate, the Yacht shall be so arranged that the Marine Evacuation Systems in their stowed positions are protected from damage by heavy seas.

13.15.3 Functional Requirements for Marine Evacuation Systems

.1 MES shall be arranged such that liferafts shall be securely attached to the platform and released from the platform by a person either in the liferaft or on the platform;

.2 MES shall be capable of being deployed from the ship under unfavourable conditions of trim of up to 10° and list of up to 20° either way;

.3 in the case of being fitted with an inclined slide, operate such that the angle of the slide to the horizontal is:

i. within a range of 30° to 35° when the ship is upright and in the lightest sea-going condition; and

ii. a maximum of 55° in the final stage of flooding set by the applicable requirements in Section 11.3.

.4 Any part requiring maintenance by the ship's crews shall be readily accessible and easily maintained.

.5 So constructed and installed that where one or more Marine Evacuation Systems are provided, at least 50% of such systems shall be subjected to a trial deployment after installation. Subject to these deployments

being satisfactory, the untried systems shall be deployed within 12 months of installation.

.6 Any inflatable liferaft used in conjunction with the marine evacuation system shall:

i. be sited close to the system container but be capable of dropping clear of the deployed system and boarding platform.

ii. be capable of release one at a time from its stowage rack with arrangements which shall enable it to be moored alongside the platform.

iii. be stowed with its painter permanently attached to the ship.

iv. stowed with a float-free arrangement complying with the requirements of paragraph 4.1.6 of the LSA Code so that each floats free and, if inflatable, inflates automatically when the ship sinks.

v. be so stowed as to permit manual release of one raft or container at a time from their securing arrangements.

vi. be provided with pre-connected or easily connected retrieving lines to the platform.

vii. Shall be self-righting or canopied reversible type where the rafts are too large to be righted by the crew.

13.16 Emergency Training and Drills

13.16.1 See section 29 for requirements

13.17 Additional Equivalence Considerations

13.17.1 None

13.18 Alternative Design and Arrangements

13.18.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

14 FIRE SAFETY & STRUCTURAL FIRE PROTECTION

PART A – GENERAL REQUIREMENTS

14.1 Protection of Spaces Containing Vehicles or Craft with Fuel in their Tanks or Lockers Storing such Fuels and Spaces Containing Recreational Dive Systems.

14.1.1 Special consideration shall be given to safe conditions of carriage of petrol and other highly flammable liquids either in hand portable containers/tanks or in the tanks of vehicles (such as personal watercraft, motor cars and helicopters) which may be transported. This section is not considered applicable to diesel stowage.

14.1.2 The quantity of spare petrol and/or other highly flammable liquids carried shall be kept to a minimum, generally up to 150 litres maximum. Greater quantities may be specially considered by the BMA when the storage location, ventilation, containers, fire suppression and space fire protection and detection are considered adequate for the given increase.

14.1.3 Containers used for the carriage of flammable liquids shall be constructed to a recognised standard appropriate to the contents and each container clearly marked to indicate its contents.

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 Enclosed spaces, and larger lockers on open deck, designated for the safe carriage of petrol or similar fuel, refuelling units or vehicles with fuel in their tanks shall be fitted with:

.1 A manual water spray system giving a coverage of 3.5 litre/m^2/minute over the total area of deck, which may be taken from the fire main with the isolating valve located outside the garage. An equivalent arrangement may be considered. Adequate provision shall be made for drainage of water introduced to the space. This shall not lead to machinery or other spaces where a source of ignition may exist.

.2 A fixed fire detection and fire alarm system complying with the requirements of SOLAS II-2/Part A / Fire Safety Systems Code Chapter IX. The system within the space shall also comply with 14.1.5.5.

.3 Ducted mechanical exhaust ventilation, which is isolated from other ventilated spaces, shall provide the following:

i. at least 6 air changes per hour (based on the gross empty space between structures). Ventilation systems may be operated at lower air changes per hour when controlled by a detection system that monitors the flammable and harmful gases in the space[24];

ii. reduction of the airflow shall be signalled by an audible and visual alarm on the navigating bridge and at the "in port" control station(s);

iii. exhaust ducting shall be arranged to extract from the lower bilge area;

iv. if the fan motors are located in the space or in the ventilation duct they shall be certified safe to the correct designation for the flammable vapour/liquid; and

v. the ventilation fans shall be of a non-sparking type and the ventilation system shall be capable of rapid shut down and effective closure in event of fire.

.4 A suitable gas detection system shall be provided, appropriate to the type of vehicle fuel or recreational dive system, with audible and visual alarm in the wheelhouse and where it may always be observed by the crew.

.5 All electrical equipment located up to 450 millimetres above the deck shall be certified safe for petrol vapours.

.6 Electrical equipment located higher than 450 millimetres above the deck shall either:

i. be to IP55 standard of construction (IEC Publication 529 - Classification of Degree of protection Provided by Enclosures); or

ii. provided with automatic isolation (on all poles) located outside the space on activation of the gas detection system. This option shall not be used for safety systems such as steering motors, rudder indicators, etc.

.7 Regardless of the height of installation, it is considered that the following equipment located within the space shall be certified safe for the flammable vapours:

i. gas detection system

ii. bilge alarm

iii. fire detection system

[24] Refer to the revised design guidelines and operational recommendations for ventilation systems in ro-ro cargo spaces (MSC.1/Circ.1515)

iv. at least one light fitting (on a dedicated circuit, possibly emergency)

It shall be noted that electrical equipment includes starters, distribution boxes, etc.

.8 The drainage or bilge system shall be sized to remove no less than 125% of the combined capacity of both the water-spraying system pumps and the required number of fire hose nozzles, taking into account the guidelines developed by the IMO[25]. The drainage system valves shall be operable from outside the protected space at a position in the vicinity of the extinguishing system controls. If this is not possible, the adverse effect upon stability of the added weight and free surface of water shall be taken into account to the extent deemed necessary by the BMA. Such information shall be included in the stability book.

.9 Provision shall be made to ensure that vehicles, craft, recreational diving systems and ancillary equipment are securely fastened with due consideration being given to the relative motion of the Yacht and possible movement between components. The design of diving equipment mounting and securing arrangements shall also consider mitigating the effects of heat transmission in the event of a fire in an adjacent space.

14.2 Construction and Arrangement of Saunas

14.2.1 All boundaries of the sauna shall be of "A" class divisions, and may include changing rooms, showers and toilets. The sauna shall be insulated to A-60 for vessels of 500GT and above, A-30 for vessels under 500GT, and B-15 for Short Range Yachts, against other spaces except those inside the perimeter of the sauna.

14.2.2 Bathrooms with direct access to saunas may be considered as part of them. In such cases, the door between sauna and the bathroom need not comply with fire safety requirements.

14.2.3 Wooden linings on bulkheads and ceilings are permitted. The ceiling above the oven shall be lined with a non-combustible plate with an air gap of at least 30 millimetres. The distance from the hot surfaces to combustible materials shall be at least 500 millimetres or the combustible materials shall be protected (e.g. non-combustible plate with an air gap of at least 30 millimetres).

[25] Refer to the Guidelines for drainage systems in closed vehicle and ro-ro spaces and special category spaces, to be developed by the IMO.

14.2.4 Wooden benches are permitted.

14.2.5 The sauna door shall open outwards by pushing.

14.2.6 Electrically heated ovens shall be provided with a timer.

14.2.7 All spaces within the perimeter of the sauna shall be protected by a fire detection and alarm system and an automatic sprinkler system.

14.3 Construction and Arrangement of Steam Room

14.3.1 The perimeter of the steam room may include changing rooms, showers and toilets.

14.3.2 Bathrooms with direct access to suite may be considered as part of it. In such cases, the door between suite and the bathroom need not comply with fire safety requirements.

14.3.3 If a steam generator of more than 5 kW is contained within the perimeter, the suite boundary shall be constructed to an A-0 standard, or B-0 for Short Range Yachts. If a steam generator of more than 5 kW is not contained within the perimeter the steam generator shall be protected by A-0 standard divisions, or B-0 for Short Range Yachts and pipes leading to the discharge nozzles shall be lagged.

14.3.4 If a suite arrangement contains a sauna then the requirements contained in 14.2 are applicable, regardless of the steam generator location.

14.3.5 All spaces within the perimeter shall be protected by a fire detection and alarm system.

14.4 Deep Fat Frying Equipment

14.4.1 Attention is drawn to the requirements in SOLAS II-2/10.6.4 for fire extinguishing systems for deep fat cooking equipment.

14.4.2 For fryers of up to 15 litres cooking oil capacity, the provision of a suitably sized Class F extinguisher together with manual isolation of the electrical power supply is acceptable.

14.5 Fire Control Plan(s)

14.5.1 A fire control (general arrangement) plan(s) shall be permanently exhibited for the guidance of the Master and crew of the vessel. The content of the plan(s) shall adequately show and describe the principal fire prevention and protection equipment and materials. As far as practical, symbols used on the plans shall

comply with a recognised international standard. The fire control plan may be a combined Fire and Safety Plan, which shall show the positions of stowage of the life-saving and fire appliances.

14.5.2 For each deck, the plan(s) shall show the position of control stations; sections of the vessel which are enclosed respectively by "A" class divisions and "B" class divisions; location of flammable liquid storage (see section 14.1.); particulars of and locations of fire alarms, fire detection systems, sprinkler installations, fixed and portable fire extinguishing appliances; fireman's outfit(s); means of access and emergency escapes for compartments and decks; locations and means of control of systems and openings which shall be closed down in a fire emergency.

14.5.3 The plan(s) required by 14.5.1 shall be kept up to date. Updating alterations shall be applied to all copies of the plan(s) without delay. Each plan shall include a list of alterations and the date on which each alteration was applied.

14.5.4 A duplicate set of the plan(s) shall be permanently stored in a prominently marked weathertight enclosure readily accessible to assist non-vessel fire-fighting personnel who may board the vessel in a fire emergency.

14.5.5 Instructions valid to the maintenance and operation of all the equipment and installations onboard for the fighting and containment of fire shall be kept in one document holder, readily available in an accessible location. For yachts over 500GT, a Fire Training Manual, as required by SOLAS II-2/15 shall be provided

14.6 Storage of Large Quantities of Petrol in Fixed Tanks

14.6.1 This section shall be applied to dedicated petrol (gasoline) tanks used for refilling the yacht’s tenders and jet skis, etc. located in a specially dedicated space. If such a petrol storage system is proposed, the safety considerations outlined in this section shall be met to the satisfaction of the BMA.

14.6.2 Storage tank design, construction and material shall be in accordance with the rules of a Recognised Organisation. Independent tanks shall be constructed of steel with no penetrations in bottom and sides.

14.6.3 Storage tanks shall be located in a dedicated gas tight compartment for that purpose only, except associated equipment for fuel transfer is allowed in this space.

14.6.4 Tanks may not be stored:

.1 within category A machinery spaces;

.2 under sleeping accommodation;

.3 forward of the collision bulkhead;

.4 less than B/5 from ship side;
.5 less than 760 millimetres from bottom plating; and
.6 adjacent to the aft end.

14.6.5 Tanks shall be explosion protected, meeting Recognised Organisation rules, to ventilate the storage tanks to a safe location to the satisfaction of the BMA and to prevent the risk of overpressure and fire/explosion. A vapour recovery system is recommended.

14.6.6 Remote means of tank level monitoring shall be provided outside the tank space, with a high-level alarm to prevent overfilling of the tank. Gauge glasses are not permitted.

14.6.7 The space in which the tank is situated shall have gastight boundaries to adjacent spaces and be insulated to class “A-60”.

14.6.8 The tank space fire detection shall be part of the vessel’s addressable fire detection system.

14.6.9 The tank space fire suppression shall be in accordance with 14.1.5.1.

14.6.10 The tank space ventilation shall be in accordance with 14.1.5.3.

14.6.11 The tank space ventilation outlet shall be located in a safe position and shall be fitted with a flame arrester in accordance with IMO MSC/Circ.677.

14.6.12 Tank space water drainage system shall be provided, sized to remove no less than 125% of the water capacity from the required fire-suppression systems, and shall not be connected to any other system. Alternatively, if stability requirements are still met in the event of the tank space being completely filled with water, the drainage system can be less than the capacity of the required fire suppression systems.

14.6.13 A suitable gas detection system shall be provided, with audible and visual alarm in the wheelhouse in each space through which petrol lines pass, including the tank space, in accordance with the Rules of a Recognised Organization.

14.6.14 Electrical equipment, including fixed and portable lighting, for use in the tank space and within the hazardous zone areas shall be kept to a minimum and shall be certified safe for petrol vapours.

14.6.15 Petrol system pipework shall:

.1 be steel and enclosed within a gas tight steel box or pipe fitted with a leak detection system;

.2 if within a steel box/cofferdam, then the space shall have a petrol vapour gas detection system;

.3 not be led directly through accommodation or machinery spaces; and

.4 between storage tank, dispenser and bunker station be kept as short as possible.

14.6.16 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.

14.6.17 Shore to vessel petrol bunker connections shall be of closed type and suitably grounded during bunkering operations.

14.6.18 At least two portable foam fire extinguishers or equivalent for petrol fires, of at least 9 litres capacity, shall be provided near the petrol dispenser.

14.6.19 At least two portable foam fire extinguishers or equivalent for petrol fires, of at least 9 litres capacity, shall be provided near the filling (bunker) station

14.6.20 Means shall be provided for leakage protection to contain and remove any leakages from the storage tanks, dispenser and bunker station equipment to a safe location, e.g. save-alls. The drainage system shall not be connected to any other onboard system.

14.6.21 Hazardous zone areas shall be provided in accordance with a Recognised Organisation's Rules, e.g. distance from the storage tank vent, dispenser and bunkering station to any sources of ignition.

14.6.22 Safety signage ("No Smoking" signs, etc.) shall be fixed or temporary safety signs shall be provided in accordance with recognised standards in all appropriate areas including, but not limited to:

.1 bunkering

.2 dispensing

.3 tank storage

.4 vent outlets

14.6.23 Operational procedures shall be documented in the safety management system and enforced including, but not limited to:

.1 Risk assessment carried out.

.2 Emergency procedures for various scenarios shall be developed and drilled, e.g. Shipboard Oil Pollution Emergency Plan (SOPEP) and bunkering and dispensing procedures.

.3 No storage within tank space.

.4 Regular tank space inspections for integrity/cleanliness.

.5 Tank space access hatch shall be kept closed except for entry.

.6 No unauthorised access to tank space.

.7 Entry into enclosed tank space procedures shall be enforced.

.8 No naked flames.

.9 No smoking.

14.7 Additional Equivalence Considerations

14.7.1 None

14.8 Alternative Design and Arrangements

14.8.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

PART B – VESSELS OF LESS THAN 500 GT

14.9 General

14.9.1 Terms used in this section shall have the same meaning as defined in SOLAS.

14.9.2 Table 14.9 is a guide to the major requirements of this section. The table is intended as a quick reference to the requirements and is not to be used in isolation when designing the fire safety arrangements.

Passive fire protection (see 14.10)	Category A machinery spaces: 'A-30' ('B-15' for short range yachts) Galleys: 'B-15' (for yachts not being short range yachts)
Means of escape (see 14.11): Category A machinery spaces. Accommodation and other spaces.	 Two (2) Two (2)
Fixed fire detection system (see 14.15)	Fitted in machinery spaces. Fitted in service spaces, control stations and accommodation spaces.
Automatic sprinkler system or equivalent	Fitted in yachts that do not meet restrictions on combustible materials (see 14.10.4.6 & 14.10.4.8

Table 14.9

14.10 Structure

14.10.1 Purpose

14.10.1.1 The purpose of this section is to provide for containment of a fire in the space of origin. For this purpose, the following functional requirements shall be met:

.1 the engine room and galley shall be contained within boundaries required by this section;

.2 the fire integrity of the divisions shall be maintained at openings and penetrations.

14.10.2 Forms of construction - Fire divisions

14.10.2.1 Fire divisions required by section 14.10.3 shall be constructed in accordance with the remaining paragraphs of this section.

14.10.2.2 Fire divisions using steel equivalent, or alternative forms of construction may be accepted if it can be demonstrated that the material by itself, or due to non-

combustible insulation provided, has the fire resistance properties equivalent to those divisions required by section 14.10.3.1 and 14.10.3.2.

14.10.2.3 Insulation required by section 14.10.2.2 shall be such that the temperature of the structural core does not rise above the point at which the structure would begin to lose its strength at any time during the applicable exposure to the standard fire test as referenced in the Fire Test Procedures Code. For 'A' class divisions, the applicable exposure is 60 minutes, and for 'B' class divisions, the applicable exposure is 30 minutes.

14.10.2.4 For aluminium alloy structures, the insulation shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure.

14.10.2.5 For composite structures, the insulation shall be such that the temperature of the laminate does not rise more than the minimum temperature of deflection under load of the resin at any time during the applicable fire exposure. The temperature of deflection under load shall be determined in accordance with a recognised international standard.

14.10.2.6 Insulation need only be applied on the side that is exposed to the greatest fire risk (for example, inside the engine room). A division between two such spaces shall however be insulated on both sides unless it is a steel division.

14.10.2.7 Special attention shall be given to the fixing of fire door frames in bulkheads constructed of materials other than steel. Measures shall be taken to ensure that the temperature of the fixings when exposed to fire does not exceed the temperature at which the bulkhead itself loses strength.

14.10.3 Structural fire protection

14.10.3.1 Machinery spaces of category 'A', shall be totally enclosed by 'A-30' Class boundaries (bulkheads, side shell and deck heads). For Short Range Yachts, such machinery spaces shall be totally enclosed by "B-15" Class boundaries (bulkheads, side shell and deck heads).

14.10.3.2 Yachts which are not Short Range Yachts are to have galleys totally enclosed by "B-15" Boundaries (bulkheads, side shell and deck heads). Windows within the exterior hull or superstructure within this boundary are not expected to meet "B-15" standards.

14.10.3.3 Openings in 'A' and 'B' Class divisions shall be provided with permanently attached means of closing that shall be at least as effective for resisting fires as

the divisions in which they are fitted. Generally, windows shall not be fitted in machinery space boundaries.

14.10.3.4 Where 'A' Class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for girders, beams or other structural members, arrangements shall be made to ensure that the fire resistance is not impaired.

14.10.3.5 Where 'B' Class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired.

14.10.3.6 Where 'A' Class divisions are required to be insulated, it shall be ensured that the heat from a fire is not transmitted through the intersections and terminal points of the divisions or penetrations to uninsulated boundaries. Where the insulation installed does not achieve this, arrangements shall be made to prevent this heat transmission by insulating the horizontal and vertical boundaries or penetrations for a distance of 450 millimetres.

14.10.4 Materials

14.10.4.1 Except in refrigerated compartments of service spaces, all insulation (e.g. thermal and acoustic) shall be of not readily-ignitable materials.

14.10.4.2 Pipes penetrating 'A' or 'B' Class divisions shall be of approved materials having regard to the temperature such divisions are required to withstand.

14.10.4.3 Pipes conveying oil or other combustible liquids through accommodation and service spaces shall be of approved materials having regard to the fire risk.

14.10.4.4 Materials readily rendered ineffective by heat are not to be used for overboard scuppers, sanitary discharges, and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to danger of flooding. Due regard shall be paid to the Fire Test Procedures Code.

14.10.4.5 Vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings for cold service system need not be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces are to have low flame spread characteristics.

14.10.4.6 Upholstery composites (fabric in association with any backing or padding material) used throughout the vessel excluding open decks shall be approved in accordance with the Fire Test Procedures Code, Annex 1, Part 8, or equivalent in accordance with 14.10.4.9. This does not apply to spaces fitted with sprinklers or equivalent fixed fire extinguishing systems.

14.10.4.7 Organic foams used in upholstered furniture and mattresses shall be of the combustion modified type.

14.10.4.8 Suspended textile materials such as curtains or drapes shall be approved in accordance with the Fire Test Procedures Code, Annex 1, Part 7, or equivalent in accordance with 14.10.4.9. This does not apply to spaces fitted with sprinklers or equivalent fixed fire extinguishing systems.

14.10.4.9 Where upholstery composites and suspended textile materials do not meet Fire Test Procedures Code standards in accordance with 14.10.4.6 and 7, they may meet equivalent standards as follows:

.1 Materials shall be subject to fire protection treatment process;

.2 Vessel shall have installed a sprinkler or equivalent fixed fire extinguishing system, that is compliant with the Fire Safety Systems Code in all aspects except they may be exempt from Fire Safety Systems Code Chapter 8 section 2.2.2 requirement for 2 sources of power. Or for sprinkler systems equivalent to that referred to in SOLAS II-2/12, Section 3.8 of the Annex to Resolution A.800(19). The system shall be designed to enable simultaneous operation of all sprinklers fitted in the most hydraulically demanding area. The minimum area for simultaneous operation may be taken as the largest enclosed accommodation space protected; or

.3 An equivalent standard acceptable to the BMA.

14.10.5 Surface of Insulation:

14.10.5.1 In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours. Insulation boundaries shall be arranged to avoid immersion in oil spillages.

14.10.6 Fuel Arrangements:

14.10.6.1 Arrangements for the storage, distribution and utilisation of oil fuel shall be such as to minimise the risk of fire or explosion.

14.10.6.2 Oil fuel tanks situated within, or adjacent to, the boundaries of Category 'A' machinery spaces are not to contain oil fuel having a flashpoint of less than 60°C.

14.10.6.3 Oil fuel, lubricating oil and other flammable oils are not to be carried in fore-peak tanks.

14.10.6.4 Every oil fuel pipe, which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom, shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position

outside the space concerned in the event of a fire occurring in the space in which such tanks are situated.

14.10.6.5 Means shall be provided to stop fuel transfer pumps, oil fired boilers and separators from outside the machinery space.

14.10.6.6 Fuel filter bowls shall be of metal construction.

14.11 Means of Escape

14.11.1 Purpose

14.11.1.1 The purpose of this section is to provide means of escape so that persons onboard can safely and swiftly escape to the liferaft embarkation deck. For this purpose, the following functional requirements shall be met:

.1 safe escape routes shall be provided;

.2 escape routes shall be maintained in a safe condition, clear of obstacles; and

.3 additional aids for escape shall be provided as necessary to ensure accessibility, clear marking, and adequate design for emergency situations.

14.11.2 Requirements

14.11.2.1 Stairways, ladders and corridors serving all spaces normally accessible shall be arranged so as to provide ready means of escape to a deck from which embarkation into survival craft may be effected.

14.11.2.2 The arrangement of the vessel shall be such that all compartments are provided with a satisfactory means of escape. In the case of the accommodation, two means of escape from every restricted space or group of spaces shall be provided. Concealed escapes and escape routes shall be clearly marked to ensure ready exit.

14.11.2.3 Category 'A' machinery spaces on motor vessels shall also be provided with a minimum of two means of escape. Other machinery spaces shall also have at least two means of escape as widely separated as possible, except where the small size of the machinery space makes it impracticable.

14.11.2.4 The normal means of access to the accommodation and service spaces below the open deck shall be arranged so that it is possible to reach the open deck without passing through a galley, engine room or other space with a high fire risk, wherever practicable.

14.11.2.5 Where accommodation arrangements are such that access to compartments is through another compartment, the second escape route shall be as remote as

possible from the main escape route. This may be through hatches of adequate size, leading to the open deck or separate space to the main escape route.

14.11.2.6 In exceptional circumstances, a single means of escape may be accepted for spaces, other than accommodation spaces, that are entered only occasionally, if the escape route does not pass through a galley, machinery space or watertight door.

14.11.2.7 No escape route shall be obstructed by furniture or fittings. Additionally, furniture along escape routes shall be secured in place to prevent shifting if the yacht rolls or lists.

14.11.2.8 All doors in escape routes shall be openable from either side. In the direction of escape they are all to be openable without a key. All handles on the inside of weathertight doors and hatches shall be non-removable. Where doors are lockable measures to ensure access from outside the space shall be provided for rescue purposes.

14.11.3 Lifts are not considered as forming a means of escape.

14.11.4 Adequate deck area shall be provided at muster stations and embarkation areas having due regard to the expected number of persons. Generally, muster stations shall be provided close to the embarkation stations. Each muster station shall have sufficient clear deck space to accommodate all persons assigned to muster at that station, but at least 0.35m^2 per person.

14.12 Ventilation systems

14.12.1 Ventilation fans for machinery spaces and enclosed galleys shall be capable of being stopped, and main inlets and outlets of ventilation systems closed, from outside the spaces being served. This position shall not be readily cut off in the event of a fire in the spaces served.

14.12.2 Ventilation ducts for Category 'A' machinery spaces, galleys, spaces containing vehicles or craft with fuel in their tanks, or lockers storing such fuels, are generally not to pass through accommodation spaces, service spaces or control stations. Where this is unavoidable, the trunking shall be constructed of steel at least 3 millimetres thick or equivalent to the satisfaction of the BMA. The ducting within the accommodation shall be fitted with:

.1 fire insulation to A-30 (“B-15” on Short Range Yachts) standard to a point at least 5 metres from the boundary of the machinery space or galley; and

.2 automatic fire dampers located in the deck or bulkhead within the accommodation where the trunking passes from the machinery space or

galley into the accommodation. These automatic fire dampers are also to be manually closable from outside the galley or machinery space; and

.3 fixed means for extinguishing a fire within the galley exhaust duct.

14.12.3 Ventilation ducts for accommodation spaces, service spaces or control stations are not to pass through Category 'A' machinery spaces, galleys, spaces containing vehicles or craft with fuel in their tanks, or lockers storing such fuels, unless the ducts are constructed of steel and arranged to preserve the integrity of the division.

14.12.4 Store-rooms containing highly flammable products shall be provided with ventilation arrangements that are separate from other ventilation systems. Ventilation shall be arranged to prevent the build-up of flammable vapours at high and low levels. The inlets and outlets of ventilators shall be positioned so that they do not draw from or vent into an area which would cause undue hazard and shall be fitted with spark arresters.

14.12.5 Ventilation systems serving Category 'A' machinery spaces shall be independent of systems serving other spaces.

14.12.6 All enclosed spaces containing free standing fuel tanks shall be ventilated independently of systems serving other spaces.

14.12.7 Ventilation shall be provided to prevent the accumulation of dangerous concentrations of flammable gas which may be emitted from batteries.

14.12.8 Ducts provided for tumble driers shall be fitted with filters readily removable for cleaning purposes and suitably located cleaning and inspection openings.

14.12.9 All fire dampers shall be capable of manual operation. The dampers shall have a direct mechanical means of release or, alternatively, be closed by electrical, hydraulic, or pneumatic operation. All dampers shall be manually operable from both sides of the division. Automatic fire dampers, including those capable of remote operation, shall have a failsafe mechanism that shall close the damper in a fire even upon loss of electrical power or hydraulic or pneumatic pressure loss. Remotely operated fire dampers shall be capable of being reopened manually at the damper.

14.12.10 Fire dampers shall be easily accessible. Where they are placed behind ceilings or linings, these ceilings or linings shall be provided with an inspection hatch on which the identification number of the fire damper is marked. The fire damper identification number shall also be marked on any remote controls provided.

14.12.11 Ventilation ducts shall be of non-combustible material except flexible bellows of short length not exceeding 600 millimetres used for connecting fans to the ducting in air-conditioning rooms. Short ducts, however, not generally exceeding 2 metres in length and with a cross-section not exceeding 0.02m^2 need not be non-combustible, subject to the following conditions:

.1 they shall be of a suitable material having regard to the risk of fire;

.2 they shall be used only at the end of the ventilation device; and

.3 they shall not be situated less than 600 millimetres, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceilings.

14.12.12 Ventilation ducts shall be provided with hatches for inspection and cleaning. The hatches shall be located near the fire dampers.

14.13 Arrangements for 'Recreational Fire Appliances'

14.13.1 'Recreational Fire Appliances' as defined in Section 2, shall meet the requirements of Section 36.

14.14 Space Heaters

14.14.1 Space heaters, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. The design and location of these units shall be such that clothing, curtains or other similar materials cannot be scorched or set on fire by heat from the unit.

14.15 Fixed Fire Detection and Fire-Alarm Systems

14.15.1 The purpose of this section is to detect a fire in the space of origin and to provide for an alarm for safe escape and fire-fighting activity.

14.15.2 A fixed fire detection and fire alarm system shall be fitted in all enclosed spaces except those containing no significant fire risk (toilets, bathrooms, void spaces, etc). Manually operated call points shall be placed effectively to ensure a readily accessible means of notification. The fixed fire detection and fire-alarm system shall be installed in accordance with the requirements of SOLAS II-2/7 and the Fire Safety Systems Code, Chapter 9, and shall be audible externally.

14.16 Fixed Fire-Extinguishing Systems Not Required by this Section

14.16.1 Where a fixed fire-extinguishing system not required by this Section, is installed, the arrangement shall be to the satisfaction of the BMA.

14.17 Emergency Training and Drills

14.17.1 See Section 29 for requirements

14.18 Additional Equivalence Considerations

14.18.1 None

14.19 Alternative Design and Arrangements

14.19.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

PART C – VESSELS OF 500 GT AND ABOVE

14.20 General Requirements

14.20.1 Table 14.20 is a guide to the major requirements of this section. The table is intended as a quick reference to the requirements and is not to be used in isolation when designing the fire safety arrangements

Form of construction (see 14B.2)	Steel or equivalent, or alternative forms of construction may be accepted subject to requirements.
Passive fire protection (see 14.21 to 14.27)	See tables 14.21-14.22
Means of escape (see 14.31) Category A machinery spaces Accommodation, etc.	 2 (two) 2 (two)
Fixed fire detection system (see 14.35)	Fitted in machinery spaces Fitted in service spaces, control stations and accommodation spaces
Fire extinguishing arrangements in Category A machinery spaces (see 15B)	In accordance with SOLAS II-2/10.5
Automatic sprinkler system or equivalent (see 14.35)	Fitted in all vessels

Table 14.20

14.21 Structure

14.21.1 The purpose of this Section is to contain a fire in the space of origin. For this purpose, the following functional requirements shall be met:

.1 the ship shall be subdivided by thermal and structural boundaries;

.2 thermal insulation of boundaries shall have due regard to the fire risk of the space and adjacent spaces;

.3 the fire integrity of the divisions shall be maintained at openings and penetrations.

14.21.2 The hull, superstructures, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material.

14.21.3 However, in cases where any part of the structure is of aluminium alloy, the following shall apply:

.1 Insulation of aluminium alloy components of "A" or "B" class divisions, except structure which, in the opinion of the BMA, is non-load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the

applicable fire exposure to the standard fire test. This insulation shall be applied on all sides except for the upper sides of decks and the outside of the vessel.

.2 Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions to ensure that for members:

i. supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in (a) above shall apply at the end of one hour; and

ii. supporting "B" class divisions, the temperature rise limitation specified in (a) above shall apply at the end of half an hour.

.3 Aluminium alloy components of divisions that are required to be equivalent to steel (identified by an * in tables 1 and 2) shall be insulated with 25 millimetres of 100kg/m^3 of mineral wool or equivalent for other insulation types, approved for use in “A” class divisions or with an equivalent insulation acceptable to the BMA.

14.21.4 Composite structures:

14.21.4.1 The insulation shall be such that the temperature of the laminate does not rise more than the minimum temperature of deflection under load of the resin at any time during the specified fire exposure. The temperature of deflection under load shall be determined in accordance with the requirements of a recognised international standard. This insulation shall be applied on all sides except for the upper sides of decks and the outside of the vessel.

14.21.4.2 Special attention shall be given to the insulation of composite components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" class divisions to ensure that for members:

.1 supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in .1 above shall apply at the end of one hour; and

.2 supporting "B" class divisions, the temperature rise limitation specified in .1 above shall apply at the end of half an hour.

14.21.4.3 Special attention shall be given to the fixing of fire door frames in bulkheads constructed of materials other than steel. Measures shall be taken to ensure that the temperature of the fixings when exposed to fire does not exceed the temperature at which the bulkhead itself loses strength.

14.21.5 Crowns and casings of a machinery space of category A shall be A60 divisions and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

14.21.6 For structures in contact with sea-water, the required insulation shall extend to at least 300 millimetres below the lightest waterline.

14.21.7 Fire divisions using steel equivalent, or alternative forms of construction may be accepted if it can be demonstrated that the material by itself, or due to non-combustible insulation provided, has the fire resistance properties equivalent to the “A” or “B” class standard required.

14.21.8 Insulation required by 14.21.7 shall be such that the temperature of the structural core does not rise above the point at which the structure would begin to lose its strength at any time during the applicable exposure to the standard fire test. For 'A' Class divisions, the applicable exposure is 60 minutes, and for 'B' Class divisions, the applicable exposure is 30 minutes.

14.22 Main Vertical Zones and Horizontal Zones

14.22.1 Hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main vertical zones by "A" class divisions. These divisions shall have insulation values in accordance with tables 14.20 and 14.21.

14.22.2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck. The length and width of main vertical zones may be extended to a maximum of 48 metres in order to bring the ends of main vertical zones to coincide with watertight subdivision bulkheads or in order to accommodate a large public space extending for the whole length of the main vertical zone provided that the total area of the main vertical zone is not greater than 800 m^2 on any deck. The length or width of a main vertical zone is the maximum distance between the furthermost points of the bulkheads bounding it.

14.22.3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

14.22.4 When a main vertical zone is subdivided by "A" class divisions for the purpose of providing an appropriate barrier between spaces protected and not protected by a sprinkler system, the divisions shall be insulated in accordance with the fire insulation and integrity values given in tables 14.20 and 14.21.

14.23 Bulkheads Within a Main Vertical Zone

14.23.1 All bulkheads within accommodation and service spaces which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in tables 14.20 and 14.21.

14.23.2 All such divisions may be faced with combustible materials.

14.23.3 All corridor bulkheads, where not required to be "A" class shall be "B" class divisions which shall extend from deck to deck except:

.1 when continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceilings or lining shall be of material which, in thickness and composition, is acceptable in the construction of "B" class divisions but which shall be required to meet "B" class integrity standards only in so far as is reasonable and practical in the opinion of the BMA;

.2 the corridor bulkheads of "B" class materials may terminate at a ceiling in the corridor provided such a ceiling is of material which, in thickness and composition, is acceptable in the construction of "B" class divisions. All doors and frames in such bulkheads shall be so constructed and erected to provide a "B" class standard.

14.23.4 All bulkheads required to be "B" class divisions, except corridor bulkheads, shall extend from deck to deck and to the shell or other boundaries unless continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, in which case the bulkhead may terminate at the continuous ceiling or lining.

14.24 Fire Integrity of Bulkheads and Decks

14.24.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in this section, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 14.20 and 14.21.

14.24.2 The following requirements shall govern application of the tables:

.1 Tables 14.20 and 14.21 shall apply respectively to the bulkheads and decks separating adjacent spaces.

.2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (9) below. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

14.24.2.1 Control stations

.1 Spaces containing emergency sources of power and lighting.

.2 Wheelhouse and chartroom.
.3 Spaces containing the vessel's radio equipment.
.4 Fire-extinguishing rooms.
.5 Fire control rooms and fire-recording stations.
.6 Control room for propulsion machinery when located outside the machinery space.
.7 Spaces containing centralized fire alarm equipment.

14.24.2.2 Corridors and lobbies

.1 Passenger and crew corridors and lobbies.

14.24.2.3 Accommodation spaces

.1 Cabins, dining rooms, lounges, offices, pantries containing no cooking appliances , and similar spaces.

14.24.2.4 Stairways

.1 Interior stairways, lifts and escalators (other than those wholly contained within the machinery space(s)) and enclosures thereto.
.2 In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

14.24.2.5 Service spaces (low risk)

.1 Lockers and store-rooms (including refrigerator and cold rooms) not having provisions for the storage of flammable liquids and having areas less than 4m^2, drying rooms and laundries, and spaces containing marine Evacuation Systems

14.24.2.6 Machinery spaces of category A

.1 Spaces so defined.

14.24.2.7 Other machinery spaces

.1 Spaces so defined, excluding machinery spaces of category A.
.2 Sprinkler, drencher or fire pump spaces.

14.24.2.8 Service spaces (high risk)

.1 Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms (including refrigerator and cold rooms) having areas of 4m^2 or more, spaces for the storage of flammable liquids, workshops other than those forming part of the machinery spaces, and spaces containing vehicles or craft with fuel in their tanks (garages), or lockers storing such fuels storage lockers for gaseous fuels for domestic purposes

14.24.2.9 *Open decks*

.1 Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deckhouses).

14.24.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

14.24.4 External boundaries which are required to be of steel or other equivalent material may be pierced for the fitting of windows and portlights provided that there is no requirement for such boundaries to have "A" class integrity elsewhere in this section. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be of combustible materials, substantially constructed.

Spaces		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Control stations	(1)	A-0_c	A-0	A-60	A-0	A-15	A-60	A-15	A-60	*
Corridors and lobbies	(2)		C_d	B-0_d	A-0_a B-0_d	B-0_d	A-60	A-0	A-0	*
Accommodation spaces	(3)			C_d	A-0_{af} B-0_d	B-0_d	A-60	A-0	A-0	*
Stairways	(4)				A-0_a B-0_d	A-0_a B-0_d	A-60	A-0	A-0	* *
Service spaces (low risk)	(5)					C_d	A-60	A-0	A-0	*
Machinery spaces of category A (6)	(6)						*	A-0	A-60	*
Other machinery spaces	(7)							A-0_b	A-0	*
Service spaces (high risk)	(8)								A-0_b	*
Open decks	(9)									

Table 14.21 – Fire integrity of bulkheads separating adjacent spaces

Spaces below \ Spaces above		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	*
Corridors and lobbies	(2)	A-0	*	*	A-0	*	A-60	A-0	A-0	*
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	*
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	*
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	*
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	$A\text{-}60_e$	A-60	*
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	*
Service spaces (high risk)	(8)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	A-0	*
Open decks	(9)	*	*	*	*	*	*	*	*	-

Table 14.22 – Fire integrity of decks separating adjacent spaces

Notes: To be applied to both tables 14.21 and 14.22, as appropriate:

a. For clarification on which applies, see sections 14.23 and 14.25.
b. Where spaces are of the same numerical category and subscript $_b$ appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
c. Bulkheads separating the wheelhouse and chartroom from each other may be "B-0" rating.
d. For the application of section 14.22.1, "B-0" and "C", where appearing in table 14.21, shall be read as "A-0".
e. Fire insulation need not be fitted if the machinery space in category (7), in the opinion of the BMA, has little or no fire risk.
f. For spaces located entirely within the 'A' class boundaries of a stairway enclosure, see 14.29.7
* Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of 'A' class standard.

For the application of section 14.22.1 an asterisk, where appearing in table 14.22, except for category (9), should be read as "A-0".

14.25 Protection of stairways and lifts in accommodation and service spaces

14.25.1 A stairway shall be of steel frame construction except where the BMA sanctions the use of other equivalent material, and shall be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:

.1 an isolated stairway which penetrates a single deck only may be protected at one level only, by at least "B" class divisions and self-closing door(s);

and

.2 stairways may be fitted in the open in a public space, provided they lie wholly within such public space.

14.25.2 A stairway enclosure shall have direct communication with the corridors and be of sufficient area to prevent congestion, having in view the number of persons likely to use them in an emergency. In so far as is practical, stairway enclosures shall not give direct access to galleys, machinery spaces, service lockers, or other enclosed spaces containing combustibles in which a fire is likely to originate.

14.25.3 A lift trunk shall be so fitted to prevent the passage of flame from one 'tween-deck to another and shall be provided with means of closing to permit the control of draught and smoke.

14.26 Openings in "A" class divisions

14.26.1 Except for hatches between store and baggage spaces, and between such spaces and the weather decks, all openings shall be provided with permanently attached means of closing which shall be at least as effective for resisting fires as the divisions in which they are fitted.

14.26.2 The construction of all doors and door frames in "A" class divisions, with the means of securing them when closed, shall provide resistance to fire as well as the passage of smoke and flame, as follows:

.1 Doors in 'A' class divisions shall comply with the Fire Test Procedures Code, Annex 1, Part 3;

.2 Doors approved without the sill being part of the frame, which, shall be installed such that the gap under the door does not exceed 12 millimetres. A non-combustible sill shall be installed under the door such that floor coverings do not extend beneath the closed door, except where it can be demonstrated that the flooring is not readily ignitable;

.3 Sliding steel watertight doors need not be insulated.

14.26.3 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

14.26.4 Fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures other than power-operated watertight doors and those which are normally locked, shall satisfy the following requirements:

.1 the doors shall be self-closing and be capable of closing with an angle of inclination of up to 3.5° opposing closure;

.2 the approximate time of closure for hinged fire doors shall be no more than 40 seconds and no less than 10 seconds from the beginning of their movement with the ship in the upright position. The approximate

uniform rate of closure for sliding doors shall be of no more than 0.2 m/s and no less than 0.1 m/s with the ship in the upright position;

.3 the doors, except those for emergency escape trunks, shall be capable of remote release from the continuously manned central control station, either simultaneously or in groups and shall also be capable of release, individually, from a position at the door. Release switches shall have an on-off function to prevent automatic resetting of the system;

.4 hold-back hooks not subject to central control station release are prohibited;

.5 a door closed remotely from the central control station shall be capable of being re-opened from both sides of the door by local control. After such local opening, the door shall automatically close again;

.6 indication shall be provided at the fire door indicator panel in the continuously manned central control station whether each door is closed;

.7 the release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or central power supply;

.8 local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated after disruption of the control system or central power supply at least ten times (fully opened and closed) using the local controls;

.9 disruption of the control system or central power supply at one door shall not impair the safe functioning of the other doors;

.10 remote-released sliding or power-operated doors shall be equipped with an alarm that sounds at least 5 seconds but no more than 10 seconds after the door being released from the central control station and before the door begins to move and continues sounding until the door is completely closed;

.11 a door designed to re-open upon contacting an object in its path shall re-open not more than 1 metre from the point of contact;

.12 double-leaf doors equipped with a latch necessary for their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the system;

.13 the components of the local control system shall be accessible for maintenance and adjusting;

.14 power-operated doors shall be provided with a control system of an approved type which shall be able to operate in case of fire and be in accordance with the Fire Test Procedures Code. This system shall satisfy the following requirements:

i. the control system shall be able to operate the door at the temperature of at least 200°C for at least 60 minutes, served by the power supply;

ii. the power supply for all other doors not subject to fire shall not be impaired; and

iii. at temperatures exceeding 200°C the control system shall be automatically isolated from the power supply and shall be capable of keeping the door closed up to at least 945°C.

14.26.5 Where “A” class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for girders, beams or other structural members, arrangements shall be made to ensure that the fire resistance is not impaired.

14.27 Openings in "B" class divisions

14.27.1 Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire as follows:

.1 Doors in ‘B’ class divisions shall comply with the Fire Test Procedures Code, Annex 1, Part 3;

.2 Ventilation openings may be permitted in the lower portion of such doors. When such an opening is in or under a door the total net area of the opening(s) shall not exceed 0.05 m^2. When such an opening is cut in a door it should be fitted with a grill made of non-combustible material.

.3 Doors approved as ‘B’ class without the sill being part of the frame shall be installed such that the gap under the door does not exceed 25 millimetres.

14.27.2 Where ‘B’ class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired.

14.28 Windows and Portlights (see also 5.4 and 5.5)

14.28.1 All windows and portlights in bulkheads within accommodation spaces, service spaces and control stations shall be so constructed to preserve the integrity requirements of the type of bulkheads in which they are fitted.

14.28.2 Windows shall not be fitted in machinery space boundaries. However, this does not preclude the use of glass in control rooms within the machinery spaces.

14.29 Details of Construction

14.29.1 In accommodation and service spaces, control stations, corridors and stairways:

.1 air spaces enclosed behind ceilings, panelling or linings shall be suitably divided by close-fitting draught stops not more than 14 metres apart; and

.2 in the vertical direction, enclosed air spaces, including those behind linings of stairways, trunks, etc. shall be closed at each deck.

14.29.2 The draught stops shall be non-combustible and are to form a continuation above the ceiling of the bulkhead below or the other side of the panelling or lining to the bulkhead, as far as possible.

14.29.3 Where the structure or "A" class divisions are required to be insulated, it shall be ensured that the heat from a fire is not transmitted through the intersections and terminal points of the divisions or penetrations to uninsulated boundaries. Where the insulation installed does not achieve this, arrangements shall be made to prevent this heat transmission by insulating the horizontal and vertical boundaries or penetrations for a distance of 450 millimetres.

14.29.4 Without impairing the efficiency of the fire protection, the construction of ceilings and bulkheads shall allow a fire patrol to detect any smoke originating in concealed and inaccessible places, except where there is no risk of fire originating in such places.

14.29.5 When gaseous fuel is used for domestic purposes, the arrangements for the storage, distribution and utilisation of the fuel shall be such that, having regard to the hazards of fire and explosion which the use of such fuel may entail, the safety of the vessel and the persons onboard are preserved.

14.29.6 Open flame gas appliances provided for cooking, heating or any other purposes, shall comply with standards acceptable to the BMA (e.g. EC directive 90/396/EEC) and the installation of open flame gas appliances shall comply with the appropriate provisions of Section 36.

14.29.7 Where toilets providing little or no fire risk and lockers providing storage for safety equipment only, are located entirely within the 'A' Class boundaries of a stairway enclosure, these spaces are not required to be treated as separate Category Spaces and in in such cases, the provision of 'C' Class bulkheads between these spaces and the stairway enclosure are considered acceptable.

14.29.8 When located within the same fire zone, multiple staircases or lifts may be contained within a single "A" Class trunk, with the provision of "C" Class bulkheads between the staircases or lifts.

14.30 Restricted use of Combustible Materials

14.30.1 Except in spaces protected by an automatic sprinkler system and fully addressable fire detection system in accordance with section 14.35, all linings, grounds, and ceilings shall be of non-combustible materials.

14.30.2 Insulation materials shall be non-combustible; however core insulation of refrigerator and cold rooms need not be. Vapour barriers and adhesives used in conjunction with insulation, as well as insulation of pipe fittings for cold service systems and domestic water need not be non-combustible, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have low flame spread characteristics.

14.30.3 Pipes penetrating "A" or "B" class divisions shall be of approved materials having regard to the temperature such divisions are required to withstand.

14.30.4 Pipes conveying oil or combustible liquids through accommodation and service spaces shall be of approved materials having regard to the fire risk.

14.30.5 Materials readily rendered ineffective by heat are not to be used for overboard scuppers, sanitary discharges, and other outlets which are close to the waterline and where the failure of the material in the event of fire would give rise to the danger of flooding.

14.30.6 Furniture in the corridors and escape routes shall be of a type and quantity not likely to obstruct access. Additionally, furniture along escape routes shall be secured in place to prevent shifting if the vessel rolls or lists.

14.30.7 Primary deck coverings within accommodation spaces, service spaces and control stations shall be of a type which will not readily ignite or give rise to toxic or explosive hazards at elevated temperatures. Reference is also to be made to the Fire Test Procedures Code, Annex 1, Parts 2 and 5.

14.30.8 Upholstery, bedding components and suspended textiles required to comply with the Fire Test Procedures Code or an equivalent standard shall be clearly labelled by the manufacturer stating the standard that they meet and any washing or cleaning instructions needed to ensure they remain fire retardant. These labels are not to be removed.

14.30.9 In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours. Insulation boundaries shall be arranged to avoid immersion in oil spillages so far as is practicable.

14.31 Means of Escape

14.31.1 The purpose of this section is to provide means of escape so that persons onboard can safely and swiftly escape to the lifeboat and liferaft embarkation deck. For this purpose, the following functional requirements should be met:

.1 Safe escape routes shall be provided;

.2 escape routes shall be maintained in a safe condition, clear of obstacles; and

.3 additional aids for escape shall be provided as necessary to ensure accessibility, clear marking, and adequate design for emergency situations.

14.31.2 Stairways and ladders shall be arranged to provide ready means of escape to the lifeboat and liferaft embarkation deck from all guest and crew accommodation spaces and service spaces in which the crew are normally employed, other than machinery spaces. In particular, the following provisions shall be complied with:

.1 Below the bulkhead deck, two means of escape, at least one of which shall be independent of watertight doors, shall be provided from each watertight compartment, main vertical zone or similarly restricted group of spaces. Exceptionally one of the means of escape may be dispensed with, due regard being paid to the nature and location of spaces and to the number of persons who might normally be accommodated or employed there.

.2 Above the bulkhead deck, there shall be at least two means of escape from each vertical fire zone or similarly restricted spaces or group of spaces, at least one of which is to give access to a readily accessible escape which shall provide continuous fire shelter from the level of its origin to the appropriate survival craft embarkation deck.

.3 Within each main vertical zone there shall be at least one readily accessible enclosed stairway providing continuous fire shelter, where practical, at all levels up to the appropriate lifeboat and liferaft embarkation decks or the highest level served by the stairway, whichever level is the highest. The width, number and continuity of the stairways shall be satisfactory for the number of persons likely to use them.

.4 Access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall avoid high fire risk areas.

.5 Stairways serving only a space and a balcony in that space shall not be considered as forming one of the required means of escape.

.6 If a radio room or wheelhouse has no direct access to the open deck, two means of escape shall be provided, one of which may be a window of sufficient size or another means.

.7 Stairways shall not exceed 3.5 metres vertical rise without the provision of a landing.

.8 In the case where direct access to the appropriate survival craft embarkation deck as required by .1 and .2 is not practical, a readily accessible escape which shall provide continuous fire shelter from the level of its origin to the appropriate open deck with subsequent direct passage to the embarkation deck can be accepted provided that these

escape routes including external staircases, have emergency lighting and slip free surfaces under foot.

.9 Protection of access from the stairway enclosures to the lifeboat and liferaft embarkation areas shall be provided either directly or through protected internal routes which have fire integrity and insulation values for stairway enclosures as determined by tables 14.21 and 14.22, as appropriate.

.10 Where public spaces span three or more open decks and contain combustibles such as furniture and give access to other enclosed spaces, each level within the space shall have two means of escape, one of which is to give access to a readily accessible escape which shall provide continuous fire shelter from the level of its origin to the appropriate survival craft embarkation deck.

14.31.3 Two means of escape shall be provided from each machinery space. In particular, the following provisions shall be complied with:

.1 The two means of escape shall consist of either:

i. two sets of steel ladders as widely separated as possible, leading to doors in the upper part of the space similarly separated and from which access is provided to the appropriate survival craft embarkation decks. One of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. This shelter shall be of steel or equivalent material, insulated where necessary, and provided with a self-closing door at the lower end. If access is provided at other levels each level shall be provided with a steel or equivalent material self-closing door; or

ii. one steel ladder leading to a door in the upper part of the space from which access is provided to the embarkation deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the embarkation deck.

.2 One of the means of escape from any such space required by section 14.31.3.1 may be dispensed with on sailing vessels with small machinery spaces, so long as either a door or a steel ladder and walkways provide a safe escape route to the embarkation deck with due regard being paid to the nature and location of the space and whether persons are normally employed in that space.

.3 Two means of escape shall be provided from a machinery control room located within a machinery space, at least one of which should provide continuous fire shelter to a safe position outside the machinery space.

.4 Two means of escape shall be provided from the main workshop within a machinery space. At least one of these escape routes shall provide a continuous fire shelter to a safe position outside the machinery space.

14.31.4 Lifts shall not be considered as forming one of the required means of escape.

14.31.5 In exceptional circumstances a single means of escape may be accepted for spaces other than accommodation spaces that are entered only occasionally, if the escape route does not pass through a galley, machinery space or watertight door.

14.31.6 Adequate deck area shall be provided at assembly stations and embarkation areas having due regard to the expected number of persons. Generally, assembly stations shall be provided close to the embarkation stations. Each assembly station shall have sufficient clear deck space to accommodate all persons assigned to assemble at that station, but at least 0.35m^2 per person.

14.32 Arrangements of Escape Routes

14.32.1 Stairways and corridors used as means of escape shall be not less than 700 millimetres in clear width and shall have a handrail on one side. Stairways and corridors with a clear width of 1,800 millimetres and above shall have handrails on both sides. "Clear width" is considered the distance between the handrail and the bulkhead on the other side or between the handrails.

14.32.2 The angle of inclination of stairways shall be, in general, 45°, but not greater than 50°, and in machinery spaces and small spaces not more than 60°.

14.32.3 Doorways which give access to a stairway shall be at least the minimal required width for the stairway being served.

14.32.4 Hatches in both bulkheads and decks shall be not less than 600 x 600 millimetres in clear width[26].

14.32.5 Where 14.32.1 to 14.32.4 cannot be reasonably achieved, alternatives may be agreed by the BMA.

[26] See MSC.1/Circ.1511 Unified Interpretations of SOLAS II-2/9 and II-2/13 for interpretation of clear width for escape trunks

14.33 Emergency Escape Breathing Devices

14.33.1 Emergency escape breathing devices (EEBDs) shall comply with the Fire Safety Systems Code. At least one spare emergency escape breathing device shall be kept onboard.

14.33.2 All vessels shall carry at least two EEBDs within accommodation spaces, and at least two EEBDs shall be carried in each main vertical zone.

14.33.3 On all vessels, within the machinery spaces, EEBDs shall be situated ready for use at easily visible locations, which can be reached quickly and easily at any time in the event of fire. The number and location shall take into account the layout of the machinery space and the number of persons normally working in the space. The number and location of these devices shall be indicated in the fire control plan.

14.34 Ventilation systems

14.34.1 Ventilation ducts shall be of non-combustible material, except flexible bellows of short length not exceeding 600 millimetres used for connecting fans to the ducting in air conditioning rooms. Short ducts, however, not generally exceeding 2 metres in length and with a cross-section not exceeding 0.02m² need not be non-combustible, subject to the following conditions:

.1 they shall be of a suitable material having regard to the risk of fire;

.2 they shall be used only at the end of the ventilation device; and

.3 they shall not be situated less than 600 millimetres, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceilings.

14.34.2 Ducts passing through “A” class divisions shall meet the following requirements:

.1 where a thin plated duct with a free cross sectional area equal to, or less than, 0.02m² passes through "A" class divisions, the opening shall be fitted with a steel sheet sleeve having a thickness of at least 3 millimetres and a length of at least 200 millimetres, divided preferably into 100 millimetres on each side of a bulkhead or, in the case of a deck, wholly laid on the lower side of the decks penetrated;

.2 where ventilation ducts with a free cross-sectional area exceeding 0.02m², but not more than 0.075m², pass through "A" class divisions, the openings shall be lined with steel sheet sleeves. The ducts and sleeves shall have a thickness of at least 3 millimetres and a length of at least 900 millimetres. When passing through bulkheads, this length shall be divided preferably into 450 millimetres on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the division through which the duct passes; and

.3 automatic fire dampers shall be fitted in all ducts with a free cross-sectional area exceeding 0.075m^2 that pass through "A" class divisions. Each damper shall be fitted close to the division penetrated and the duct between the damper and the division penetrated shall be constructed of steel in accordance with Sections 14.34.5.1 and 14.34.5.2. The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the division. The damper shall be fitted with a visible indicator which shows the operating position of the damper. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they penetrate. A duct of cross-sectional area exceeding 0.075m^2 shall not be divided into smaller ducts at the penetration of an "A" class division and then recombined into the original duct once through the division to avoid installing the damper required by this provision.

14.34.3 Ducts provided for the ventilation of machinery spaces of category A, galleys or spaces containing vehicles or craft with fuel in their tanks shall not pass through accommodation spaces, service spaces or control stations unless they comply with section 14.34.5

14.34.4 Ducts provided for the ventilation of accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys or spaces containing vehicles or craft with fuel in their tanks unless they comply with Section 14.34.5.

14.34.5 As permitted by sections 14.34.3 and 14.34.4, ducts shall be either:

.1 constructed of steel having a thickness of at least 3 millimetres for ducts with a free cross-sectional area of less than 0.075m^2, at least 4 millimetres for ducts with a free cross-sectional area of between 0.075m^2 and 0.45m^2 and at least 5 millimetres for ducts with a free cross-sectional area of over 0.45m^2;

.2 suitably supported and stiffened;

.3 fitted with automatic fire dampers close to the boundaries penetrated; and

.4 insulated to "A-60" standard from the boundaries of the spaces they serve to a point at least 5 metres beyond each fire damper; or

.5 constructed of steel in accordance with 14.34.5.1 and 14.34.5.2; and

.6 insulated to "A-60" class standard throughout the spaces they pass through, except for ducts that pass through spaces of category (9) or (10) as defined in SOLAS II-2/9.2.2.3.2.2.

14.34.6 For the purposes of Sections 14.34.5.4 and 14.34.5.6, ducts shall be insulated over their entire cross-sectional external surface. Ducts that are outside but adjacent to the specified space, and share one or more surfaces with it, shall be considered to pass through the specified space and shall be insulated over the surface they share with the space for a distance of 450 millimetres past the duct[27].

14.34.7 Ventilation ducts with a free cross-sectional area exceeding 0.02m^2 passing through "B" class bulkheads shall be lined with steel sheet sleeves of 900 millimetres in length divided preferably into 450 millimetres on each side of the bulkheads, unless the duct is of steel for this length.

14.34.8 For a control station outside machinery spaces and other normally manned control stations, practical measures shall be taken to ensure that ventilation, visibility and freedom from smoke are maintained so that, in the event of fire, the machinery and equipment contained in the control station may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. These requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.

14.34.9 Exhaust duct(s) from a galley range shall be constructed of "A" class divisions where passing through accommodation spaces and/or spaces containing combustible materials. In addition to the requirements of 14.34.3 an exhaust duct shall be fitted with:

.1 a grease trap readily removable for cleaning;

.2 a fire damper located in the lower end of the duct and in addition, a fire damper in the upper end of the duct (if required for the extinguishing medium);

.3 arrangements for shutting off the exhaust fans;

.4 fixed means for extinguishing a fire within the duct;

.5 local controls to activate extinguishing system; stop the fans and close the fire dampers shall be grouped in one position immediately outside the main entrance to the galley.

14.34.10 Where it is necessary that a ventilation duct passes through a main vertical zone division, an automatic fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The control location shall be readily accessible and be clearly and prominently marked. The duct between the division and the damper shall be

[27] Sketches of such arrangements are contained in the Unified Interpretations of SOLAS chapter II-2 (MSC.1/Circ.1276).

constructed of steel in accordance with 14.34.5.1 and 14.34.5.2 and insulated to at least the same fire integrity as the division penetrated. The damper shall be fitted on at least one side of the division with a visible indicator showing the operating position of the damper.

14.34.11 Inlets and outlets of ventilation systems shall be capable of being closed from outside the space being ventilated. The means of closing shall be easily accessible as well as prominently and permanently marked and shall indicate the operating position of the closing device.

14.34.12 Power ventilation of accommodation spaces, service spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position shall not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the power ventilation of a machinery space shall be entirely separate from the means provided for stopping ventilation of other spaces.

14.34.13 Where public spaces span three or more open decks and contain combustibles such as furniture, and other enclosed spaces, the space shall be equipped with a smoke extraction system. The smoke extraction system shall be activated by the smoke detection system required by 14.35 and shall be capable of manual control. The fans shall be capable of exhausting the entire volume within the space in not more than 10 min.

14.34.14 Store-rooms containing highly flammable products shall be provided with ventilation arrangements that are separate from other ventilation systems. Ventilation shall be arranged to prevent the build up of flammable vapours at high and low levels. The inlets and outlets of ventilators shall be positioned so that they do not draw from or vent into an area which would cause undue hazard, and shall be fitted with spark arresters.

14.34.15 Ventilation systems serving Category 'A' machinery spaces shall be independent of systems serving other spaces.

14.34.16 All enclosed spaces containing free standing fuel tanks shall be ventilated independently of systems serving other spaces.

14.34.17 Ventilation shall be provided to prevent the accumulation of dangerous concentrations of flammable gas which may be emitted from batteries.

14.34.18 Ventilation openings may be fitted in and under the lower parts of cabin and public space doors in corridor bulkheads. The total net area of any such openings is not to exceed 0.05m^2.

14.34.19 For spaces containing vehicles or craft with fuel in their tanks or lockers storing such fuels, see 14.1. For additional requirements for the ventilation of domestic gaseous fuel, see Section 36.

14.34.20 Exhaust ducts from laundries shall be fitted with filters readily removable for cleaning purposes.

14.34.21 The following arrangements shall be tested in accordance with the Fire Test Procedures Code:

.1 fire dampers, including their relevant means of operation, however, the testing is not required for dampers located at the lower end of the duct in exhaust ducts for galley ranges, which shall be of steel and capable of stopping the draught in the duct; and

.2 duct penetrations through "A" class divisions. However, the test is not required where steel sleeves are directly joined to ventilation ducts by means of riveted or screwed connections or by welding.

14.34.22 Fire dampers shall be easily accessible. Where they are placed behind ceilings or linings, these ceilings or linings shall be provided with an inspection hatch on which the identification number of the fire damper is marked. The fire damper identification number shall also be marked on any remote controls provided.

14.34.23 Ventilation ducts shall be provided with hatches for inspection and cleaning where practicable. The hatches shall be located near the fire dampers.

14.34.24 Combustible gaskets in flanged ventilation duct connections shall not be permitted within 600 millimetres of openings in "A" or "B" class divisions and in ducts required to be of "A" class construction.

14.34.25 Ventilation openings or air balance ducts between two enclosed spaces shall not be provided except as permitted by Sections 14.27.1.2.

14.34.26 All fire dampers shall be capable of manual operation. The dampers shall have a direct mechanical means of release or, alternatively, be closed by electrical, hydraulic, or pneumatic operation. All dampers shall be manually operable from both sides of the division. Automatic fire dampers, including those capable of remote operation, shall have a failsafe mechanism that shall close the damper in a fire even upon loss of electrical power or hydraulic or pneumatic pressure loss. Remotely operated fire dampers shall be capable of being reopened manually at the damper.

14.34.27 Where a ventilation room serves only such an adjacent machinery space and there is no fire division between the ventilation room and the machinery space, the means for closing the ventilation duct or ducts serving the machinery space shall be located outside of the ventilation room and machinery space.

14.34.28 Where a ventilation room serves such a machinery space as well as other spaces and is separated from the machinery space by a "A-0" class division, including penetrations, the means for closing the ventilation duct or ducts for the machinery space can be located in the ventilation room.

14.35 Fixed Fire Detection and Fire Alarm Systems and Automatic Sprinkler, Fire Detection and Fire Alarm Systems

14.35.1 The purpose of this section is to provide for detection of a fire in the space of origin and to provide for alarm for safe escape and fire-fighting activity. For this purpose, the following functional requirements shall be met:

.1 fixed fire detection and fire alarm system installations shall be suitable for the nature of the space, fire growth potential and potential generation of smoke and gases; and

.2 manually operated call points shall be placed effectively to ensure a readily accessible means of notification.

14.35.2 All control stations, accommodation and service spaces, including corridors and stairways, except spaces which afford no substantial fire risk such as void spaces and sanitary spaces, shall be provided throughout with:

.1 an automatic sprinkler where the pumps and alternative supply components shall be capable of supplying the required flow rate and pressure for the space with the greatest hydraulic demand[28]. For the purposes of this calculation, the design area used to calculate the required flow and pressure shall be the deck area of the most hydraulically demanding space, separated from adjacent spaces by “A” class divisions. The design area need not exceed 280 m^2. For application to a small ship with a total protected area of less than 280 m^2, the BMA may specify the appropriate area for sizing of pumps and alternate supply components.

.2 a fully addressable fire detection and fire alarm system of an approved type complying with the requirements of the Fire Safety Systems Code, Chapter 8 and 9, or an equivalent standard acceptable to the BMA.

14.35.3 A fixed fire detection and fire alarm system shall be fitted in all enclosed spaces except those containing no significant fire risk (toilets, bathrooms, void spaces,

[28] Refer to IMO MSC.1/Circ.1556

etc). Ceiling void spaces containing equipment that could present a fire risk shall be fitted with a fixed fire detection and fire alarm system. Manually operated call points shall be placed to ensure a readily accessible means of notification. The fixed fire detection and fire-alarm system shall be installed in accordance with the requirements of SOLAS II-2/7 and the Fire Safety Systems Code, Chapter 9, and shall be audible externally.

14.36 Public Address System

14.36.1 For vessels having a length of 85 metres or more, a public address system complying with the requirements of SOLAS III/6.5 shall be available throughout the accommodation and service spaces and control stations and open decks.

14.37 Oil Fuel Arrangements

14.37.1 Arrangements for the storage, distribution and utilisation of oil fuel shall be such as to minimise the risk of fire or explosion.

14.37.2 As far as practicable, oil fuel tanks shall be part of the vessel's structure and shall be located outside category A machinery spaces.

14.37.3 Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within category A machinery spaces, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and is preferably to have a common boundary with the double bottom tanks, and the area of the tank boundary common with the machinery spaces shall be kept to a minimum. Where the vertical boundary of a tank directly exposed to a machinery space meets the vessel's side plating at an acute angle, a small horizontal surface at the base of the tank, necessary to accommodate practical constructional considerations may be permitted. If the arrangement of the machinery is such that a tank with a large horizontal surface at the base is necessary then a cofferdam with suitable ventilation arrangements, to protect the base of the tank from the effect of a machinery space fire, will be specially considered. Oil fuel tanks situated within the boundaries of category A machinery spaces shall not contain oil fuel having a flashpoint of less than 60°C. Except for vessels constructed of materials other than steel, where steel tanks shall be provided, the use of free-standing oil fuel tanks is prohibited.

14.38 Lubricating Oil Arrangements

14.38.1 Arrangements for the storage, distribution and utilisation of oil used in pressure lubrication systems shall be such as to minimise the risk of fire or explosion.

14.39 Arrangements for Other Flammable Oils

14.39.1 Arrangements for the storage, distribution and utilisation of other flammable oils employed under pressure in power transmission systems, control and activating

systems and heating systems shall be such as to minimise the risk of fire or explosion.

14.40 Prohibition of Carriage of Flammable Oils in Forepeak Tanks

14.40.1 Oil fuel, lubricating oil and other flammable oils shall not be carried in forepeak tanks.

14.41 Space Heaters

14.41.1 Space heaters, if used, shall be fixed in position and constructed so as to reduce fire risks to a minimum. The design and location of these units shall be such that clothing, curtains or other similar materials cannot be scorched or set on fire by heat from the unit.

14.42 Covered Category (9) (Open Deck) Spaces

14.42.1 Covered open decks that have less than 30% communicating openings shall be treated as a Category (9) space with the following additional provisions:

.1 a fixed fire detection and alarm system according to Section 14.35 shall be provided;

.2 The space shall be protected by a suitable sprinkler system as defined in section 2; and

.3 ventilators and exhausts in accordance with Section 5.5 shall not terminate in these spaces when serving Accommodation, Control Stations, garages or Machinery Spaces.

14.43 Arrangements for 'Recreational Fire Appliances'

14.43.1 'Recreational Fire Appliances' as defined in section 2, shall meet the requirements of Section 36.

14.44 Emergency Training and Drills

14.44.1 See Section 29 for requirements

14.45 Additional Equivalence Considerations

14.45.1 None

14.46 Alternative Design and Arrangements

14.46.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

15 FIRE APPLIANCES

PART A – VESSELS OF LESS THAN 500 GT

15.1 General Requirements

15.1.1 Fire appliances shall be of an approved type and shall be provided to meet the minimum requirements listed in table 15.1 and the specific requirements of section 15.2.

15.1.2 Fire appliances provided in addition to those required by section 15.1.1 shall be of a type acceptable to the BMA.

15.1.3 The location of concealed fire appliances shall be clearly marked.

1	PROVISION OF WATER JET	One (sufficient to reach any part of the vessel)
2	POWER DRIVEN FIRE PUMP	One (engine or independent drive)
3	ADDITIONAL INDEPENDENT POWER DRIVEN FIRE PUMP, POWER SOURCE AND SEA CONNECTION	One (not located in the same space as item 2)
4	FIREMAIN & HYDRANTS	Sufficient to achieve item 1 with a single length of hose
5	HOSES	Three (with jet/spray nozzles each fitted with a shut-off facility)
6	PORTABLE FIRE EXTINGUISHERS[29] (accommodation and service spaces)	For each deck, one within 10 metres of any position within an accommodation or service space
7	FIRE EXTINGUISHERS (for a machinery space of Category A)	A fixed fire extinguishing system approved in accordance with the Fire Safety Systems Code; and One portable extinguisher for oil fires for each 74.6 kW power; or Two portable extinguishers for oil fires together with either one foam extinguisher of 45 litre capacity; or one CO_2 extinguisher of 16kg capacity
8	FIREMANS OUTFIT[30] (to include an approved breathing apparatus for each outfit[31])	Two
9	FIRE BLANKET in galley	One

Table 15.1 – Fire Appliances: Vessels of less than 500GT

[29] Each powder or carbon dioxide extinguisher shall have a capacity of at least 5 kg and each foam extinguisher shall have a capacity of at least 9 litres. The mass of portable fire extinguishers shall not exceed 23 kg and they shall have a fire-extinguishing capability at least equivalent to that of a 9-litre fluid extinguisher

[30] Fireman's outfits provided for helideck crew shall be of a standard acceptable to the BMA, such as EN 469

[31] An onboard means of recharging breathing apparatus cylinders used during drills shall be provided or 2 spare cylinders for each SCBA set shall be carried onboard to replace those used.

15.2 Provision of water jet

15.2.1 At least one jet of water, from a single length of hose, shall be able to reach any part of the vessel normally accessible to passengers or crew while the vessel is being navigated and any store room and any part of a storage compartment when empty.

15.3 Fire pumps

15.3.1 The power-driven fire pump shall have a capacity of

$2.5x\{1+0.066x(L(B+D))^{0.5}\}^2$ m^3/hour

where:

L is the length
B is the greatest moulded breadth
D is the moulded depth measured to the bulkhead deck at amidships.

When discharging at full capacity through 2 adjacent fire hydrants, the pump shall be capable of maintaining a water pressure of 0.2N/mm^2 at any hydrant, provided the fire hose can be effectively controlled at this pressure.

15.3.2 The second fire pump, which may be portable, shall have a capacity of at least 80% of that required by section 15.3.1 and be capable of input to the fire main. A permanent sea connection, external to the machinery space, shall be provided. "Throw-over" sea suctions are not acceptable.

15.3.3 Each centrifugal fire pump shall be provided with a non-return valve in the connection to the fire main.

15.4 Fire Main and Hydrants

15.4.1 A fire main, water service pipes and fire hydrants shall be fitted.

15.4.2 The fire main and water service pipe connections to the hydrants shall be sized for the maximum discharge rate of the pump(s) connected to the main.

15.4.3 The fire main, water service pipes and fire hydrants shall be constructed such that they will:

.1 not be rendered ineffective by heat;
.2 not readily corrode; and
.3 be protected against freezing.

15.4.4 When a fire main is supplied by 2 pumps, 1 in the machinery space and 1 elsewhere, provision shall be made for isolation of the fire main within the

machinery space and for the second pump to supply the fire main and hydrants external to the machinery space. Isolation valve(s) shall be manually operated valves fitted outside the machinery space in a position easily accessible in the event of a fire.

15.4.5 The fire main shall have no connections other than those necessary for fire-fighting or washing down.

15.4.6 Fire hydrants shall be located for easy attachment of fire hoses, protected from damage and distributed so that a single length of the fire hoses provided can reach any part of the vessel.

15.4.7 Fire hydrants shall be fitted with valves that allow a fire hose to be isolated and removed when a fire pump is operating.

15.5 Fire Hoses

15.5.1 Fire hoses shall not exceed 20 metres in length and, generally, the diameter of a lined hose for use with a powered pump shall not be less than 38 millimetres.

15.5.2 Fire hoses and associated tools and fittings shall be kept in readily accessible and known locations close to the hydrants or connections on which they will be used. Hoses supplied from a powered pump shall have jet/spray nozzles (incorporating a shut-off facility) of diameter 19 millimetres, 16 millimetres or 12 millimetres, depending on fire-fighting purposes. For accommodation and service spaces, the diameter of nozzles need not exceed 12 mm. For machinery spaces and exterior locations, the nozzle size shall be as to obtain the maximum discharge possible from two jets at the pressure referred to in section 15.2.1, from the smallest pump.

15.5.3 Hydrants or connections in interior locations on the vessel shall have hoses connected at all times. For use within accommodation and service spaces, proposals to provide a smaller diameter of hoses and jet/spray nozzles will be considered.

15.5.4 The number of fire hoses and nozzles provided shall correspond to the functional fire safety requirements but, be at least 3.

15.6 Portable Fire Extinguishers for use in Accommodation and Service Spaces

15.6.1 The number, location, fire extinguishing medium type and capacity shall be selected according to the perceived fire risk, but for each deck, one portable extinguisher shall be available for use within a distance of 10 metres from any location. A minimum of at least 3 portable fire extinguishers shall be provided. As far as practical, the fire extinguishers provided shall have a uniform method of operation and shall be of an approved type and capacity.

15.6.2 Portable fire extinguishers of the carbon dioxide type shall not be located or provided for use in accommodation spaces.

15.6.3 Except for portable extinguishers provided in connection with a specific hazard within a space when it is manned (such as a galley), portable extinguishers generally shall be located external to, but adjacent, to the entrance of the space(s) in which they will be used. Extinguishers shall be stowed in readily accessible and marked locations.

15.6.4 Spare charges shall be provided onboard for at least 50% of each type and capacity of portable fire extinguisher onboard. When an extinguisher is not of a type which is rechargeable when the vessel is at sea, an additional portable fire extinguisher of the same type (or its equivalent) shall be provided.

15.7 Fire Extinguishing in Machinery Spaces

15.7.1 In a machinery space containing internal combustion type machinery, fire appliances shall be provided at least to the extent listed in item 7 of table 15.1 - Fire Appliances.

15.7.2 In a machinery space containing an oil-fired boiler, oil fuel settling tank or oil fuel unit, a fixed fire extinguishing system complying with the Fire Safety Systems Code shall be installed.

15.7.3 Portable fire extinguishers shall be installed and the number, location, fire extinguishing medium type and capacity shall be selected according to the perceived fire risk in the space. (Spare charges or spare extinguishers shall be provided per section 15.6.4). In any case, portable fire extinguishers for extinguishing oil fires should be fitted:

.1 in a boiler room - at least 2;

.2 in a space containing any part of an oil fuel installation - at least 2; and

.3 in a firing space - at least 1.

15.7.4 Where fixed carbon dioxide fire-extinguishing systems for the protection of machinery spaces are fitted on ships constructed before 01 July 2002, they shall comply with the provisions of paragraph 2.2.2 of chapter 5 of the Fire Safety Systems Code.

15.8 Fire-fighter's Communication

15.8.1 On existing vessels and new vessels, a minimum of two two-way portable radiotelephone apparatus for each fire party for fire-fighter's communication shall be carried onboard. Those two-way portable radiotelephone apparatuses shall be of an explosion-proof type or intrinsically safe.

15.9 Additional Equivalence Considerations

15.9.1 None

15.10 Alternative Design and Arrangements

15.10.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

PART B - VESSELS OF 500GT AND ABOVE

15.11 General Requirements

15.11.1 All vessels shall comply with the requirements of SOLAS II-2/10. as may be amended, and as appropriate to the vessel and its equipment. For the purpose of the SOLAS regulations, the standards for a cargo ship apply.

15.11.2 In no case shall the standards applied be less than those applied to a vessel of less than 500GT.

15.11.3 The location of concealed fire appliances shall be clearly marked.

15.11.4 An onboard means of recharging breathing apparatus cylinders used during drills shall be provided, or 2 spare cylinders shall be carried onboard to replace those used for each self-contained breathing apparatus set carried.

15.11.5 Fireman's outfits provided for helideck crew shall be of a standard acceptable to the BMA[32].

15.12 Additional Equivalence Considerations

15.12.1 None

15.13 Alternative Design and Arrangements

15.13.1 Vessels may follow Section 1.9 on Alternative Design and Arrangements for this Section as allowed by SOLAS II-1/55.

[32] Such as EN 469 or similar recognised national or international standard

16 RADIO

16.1 The Global Marine Distress and Safety System (GMDSS)

16.1.1 Each vessel shall carry sufficient radio equipment to perform the following distress and safety communications functions throughout its intended voyage:

.1 transmitting ship to shore distress alerts by at least two separate and independent means, each using a different radiocommunication service;

.2 receiving shore-to-ship distress alerts;

.3 transmitting and receiving ship-to-ship distress alerts;

.4 transmitting and receiving search and rescue co-ordinating communications;

.5 transmitting and receiving on-scene communications;

.6 transmitting and receiving signals for locating by radar;

.7 transmitting and receiving maritime safety information;

.8 transmitting and receiving bridge-to-bridge communications;

.9 transmitting and receiving appropriate security communications.

16.1.2 Vessels shall carry sufficient radio equipment for distress and safety communications to the satisfaction of the BMA. The radio equipment carried shall not be less than that specified in Table 16.1 of this section.

16.2 Radio equipment requirements

A1	A1+A2	A1+A2+A3		A1+A2+A3+A4
		either	***or***	
NAVTEX[1]	NAVTEX[1]	NAVTEX[1]	NAVTEX[1]	NAVTEX[1]
VHF (DSC) Radiotelephone	VHF (DSC) Radiotelephone	VHF (DSC) Radiotelephone	VHF (DSC) Radiotelephone	VHF (DSC) Radiotelephone
-	MF (DSC) Radiotelephone [2]	MF (DSC) Radiotelephone [2]	MF/HF (DSC) Radiotelephone [2]	MF/HF (DSC) Radiotelephone [2]
-	-	INMARSAT C Ship Earth Station		

Table 16.1

Notes:

1. *If the vessel is sailing in an area where an international NAVTEX service is not provided, the NAVTEX receiver shall be supplemented by an additional means of receiving MSI transmissions such as the Inmarsat enhanced group calling system.*
2. *Incorporating direct-printing telegraphy or an alternative means of receiving MSI transmissions in the Sea Areas in which the vessel is operating.*

16.2.2 The requirements for the carriage of two-way radiotelephone sets, EPIRBs and SARTs are given in Section 13, Table 13.1. EPIRBs for vessels operating in Sea Area A4 shall be capable of operating through the polar orbiting satellite service in the 406 MHz band.

16.3 Operational Performance

16.3.1 All radio communication equipment required by this section shall be of a type which is approved by the relevant authority.

16.4 Installation

16.4.1 All radio installations shall:

.1 be so located to ensure the greatest possible degree of safety and operational availability;

.2 be protected against harmful effect of water, extremes of temperature and other adverse environmental conditions;

.3 be clearly marked with the call sign, the vessel station identity and any other codes applicable to the use of the radio installation.

16.5 Sources of energy

16.5.1 Vessels less than 300GT shall have sufficient reserve energy supply to operate the radio installations for a minimum of 3 hours in addition to the emergency supply.

16.5.2 Vessels of 300GT and above but less than 500GT NOT meeting the emergency source of electrical energy requirements of SOLAS II-1/43, shall have sufficient reserve energy supply to operate the radio installations for a minimum of 6 hours in addition to the emergency supply.

16.5.3 All vessels of 300GT and above meeting the emergency requirements of SOLAS II-1/43 shall have a one hour reserve supply.

16.5.4 When a reserve source of energy consists of a rechargeable accumulator battery, a means of automatically charging such batteries shall be provided, which is capable of recharging them to minimum capacity requirements within 10 hours which shall include a visual and audible charger failure device.

16.5.5 The siting and installation of accumulator batteries shall ensure the highest degree of service and safety.

16.6 Watches

16.6.1 A vessel, while at sea, shall maintain a continuous watch:

.1 where practicable, on VHF Channel 16;

.2 where practicable, on VHF Channel 13;

.3 on VHF Digital Selective Calling (DSC), on Channel 70;

.4 if fitted with a MF/HF radiotelephone, on distress and safety DSC frequency 2187.5kHz;

.5 for satellite shore-to-ship distress alerts, if fitted, with a radio facility for reception of marine safety information by the INMARSAT enhanced group calling system; and

.6 for broadcasts of marine safety information on the appropriate frequency or frequencies, on which such information is broadcast for the area in which the vessel is navigating; normally using the international NAVTEX service or INMARSAT's enhanced group calling facility. (Further information may be obtained from the Admiralty List of Radio Signals volume 5.)

16.7 Radio Personnel

16.7.1 A vessel shall carry at least one person qualified for distress and safety radiocommunication purposes, who shall hold a certificate of competence acceptable to the relevant authority.

16.8 Availability of Equipment

16.8.1 On vessels of 300GT and above the availability of radio installations shall be ensured by:

.1 Duplication of equipment;

.2 Shore-based maintenance; or

.3 At sea electronic maintenance capability.

16.9 Radio records

16.9.1 A record shall be kept, to the satisfaction of the BMA and as required by the Radio Regulations, of all incidents connected with the radio communication service which appear to be of importance to safety of life at sea.

16.10 Additional Equivalence Considerations

16.10.1 None

17 NAVIGATION EQUIPMENT

17.1 General Requirements

17.1.1 A vessel shall be fitted with the following:

.1 A properly adjusted standard magnetic compass or other means, independent of any power supply, to determine the ship's heading.

.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 repeater shall be so positioned as to be clearly readable by the helmsman at the main steering position. It shall also be provided with an electric light, the electric power supply of which shall be on the main and emergency source of power.

17.1.2 A vessel shall be fitted with, the following additional equipment:

.1 an echo sounder;

.2 a receiver for a global navigation satellite system or a terrestrial radio-navigation system, or other means suitable for use at all times throughout the intended voyage to establish and update the ship's position by automatic means;

.3 a speed and distance measuring device, or other means to indicate speed and distance through the water;

.4 a gyro compass or spare magnetic compass bowl;

.5 a rudder angle indicator; and

.6 a 9 GHz radar.

17.1.3 For vessels of less than 300GT the equipment specified in sections 17.1.1 and 17.1.2 need not be of an approved type.

17.1.4 For vessels of more than 500GT, an automatic tracking aid, or other means, to plot automatically the range and bearing of other targets to determine collision risk shall be carried.

17.1.5 Means shall be provided for taking bearings as near as practicable over an arc of the horizon of 360°. This requirement may be met by the fitting of a pelorus compass, or, on a vessel other than a steel vessel, with a hand bearing compass.

17.1.6 For vessels under 300GT the requirements of 17.1.2.4 may be met by the use of a fluxgate compass, provided that a suitable back up power supply is available to power the compass in the event of failure of the main electrical supply. Where such a compass incorporates a capability to measure magnetic deviation by undertaking a calibration routine, and where the deviation figures are recorded within the device, a deviation card is not required.

17.1.7 Attention shall be paid to magnetic effects on magnetic compasses, including fluxgate compasses, when operating in Polar Regions (i.e. north of 70° N, or south of 70° S).

17.2 Automatic Identification System (AIS)

17.2.1 All vessels of 300GT and above shall be fitted with an approved Automatic Identification System (AIS) in accordance with SOLAS Chapter V. The AIS shall:

.1 provide automatically, to appropriately equipped shore stations, other ships and aircraft, information including the ships identity, type, position, course, speed, navigational status and other safety related information;

.2 receive automatically, such information from similarly fitted ships;

.3 monitor and track ships; and

.4 exchange data with shore-based facilities.

17.3 Long Range Identification and Tracking of Ships (LRIT)

17.3.1 All vessels of 300GT and above, unless operating solely within sea area A1 (see 17.3.3), shall be fitted with a Long-Range Identification and Tracking (LRIT) system to automatically transmit the identity of the ship; the position of the ship, (latitude and longitude); and the date and time of position provided. The required shipborne equipment shall as a minimum as follows:

.1 be capable of automatically, and without human intervention onboard the ship, transmitting the ship's LRIT information at 6-hour intervals to an LRIT Data Centre;

.2 be capable of being configured remotely to transmit LRIT information at variable intervals;

.3 be capable of transmitting LRIT information following receipt of polling commands;

.4 interface directly to the shipborne global navigation satellite system equipment, or have internal positioning capability;

.5 be supplied with energy from the main and emergency source of electrical power; and

.6 be tested for electromagnetic compatibility taking into account the recommendations developed by the IMO.

17.3.2 Vessels of 300GT and above that operate exclusively in a GMDSS A1 sea area[33] and are fitted with AIS are not required to install LRIT.

17.3.3 The LRIT requirements are described in BMA Information Bulletin No. 111.

[33] Provision for exemption or equivalent arrangement is made for vessels engaged in an international voyage outside the GMDSS A1 sea area – see BMA Information Bulletin No.111.

17.3.4 The current Bahamas Authorised Testing Application Service Providers (Testing ASPs) are listed in BMA Information Notice 10, as may be amended.

17.4 Bridge Navigational Watch Alarm System (BNWAS)

17.4.1 All vessels of 150GT and above shall be fitted with a bridge navigational watch alarm system (BNWAS), in accordance with SOLAS V/19 as follows:

.1 A bridge navigational watch alarm system (BNWAS) installed prior to 1 July 2011 may subsequently be exempted from full compliance with the standards adopted by the IMO, at the discretion of the BMA.

.2 The bridge navigational watch alarm system shall be in operation whenever the ship is underway at sea.

.3 Vessels of 3000GT and above shall comply with the requirements of SOLAS V/19.

17.5 Additional Requirements for Vessels of 3,000GT and above

17.5.1 To assist in casualty investigations, vessels shall be fitted with a voyage data recorder (VDR).

17.5.2 Vessels shall be fitted with an Electronic Chart Display and Information System (ECDIS) (see also Section 18.1 on Nautical Publications).

17.5.3 Vessels shall be fitted with a 3 GHz radar or, where considered appropriate by the BMA, a second 9 GHz radar, or other means to determine and display the range and bearing of other surface craft, obstructions, buoys, shorelines and navigational marks to assist in navigation and in collision avoidance, which are functionally independent of those referred to in Section 17.1.2; and

17.5.4 Vessels shall be fitted with a second automatic tracking aid, or other means, to plot automatically the range and bearing of other targets to determine collision risk which are functionally independent of those referred to in Section 17.1.4.

17.6 Bridge Visibility

17.6.1 Navigation bridge visibility shall comply with SOLAS V/22. Vessels under 55 metres in length shall comply as far as reasonable and practicable.

17.6.2 Windows may be inclined from the vertical plane provided that, where necessary, appropriate measures are taken to avoid adverse reflections from within.

17.6.3 Windows to the navigating position shall not be of either polarised or tinted glass Portable tinted screens may be provided for selected windows.

17.6.4 Where the ship's side cannot be fully visible from the bridge wing, wing station or manoeuvring station, the use of cameras may be specially considered by the BMA

giving consideration to image quality, night vision, display screen size and location.

17.7 Navigation Lights

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

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

17.7.3 With due regard to accessibility the requirement for duplication for navigation lights required to be shown whilst underway (masthead lights and sidelights) may be satisfied by having spare bulbs that can be easily fitted within three minutes. However, vessels 500GT and above shall be fitted with duplicate lights.

17.7.4 Navigation lights shall comply with IMO Resolution MSC.253(83) 'Adoption of the performance standards for navigation lights, navigation light controllers and associated equipment'. The general requirements of MSC.253(83) are as follows:

.1 unless expressly required otherwise, navigation lights shall appear steady and non-flashing;

.2 lenses of navigation lights shall be produced in a robust, non-corroding material, which shall ensure a long-term durability for the optical qualities of the lens;

.3 masthead light, sidelights and a sternlight installed onboard vessels greater than 50 metres in length shall be duplicated or be fitted with duplicate lamps; and

.4 only lamps specified by the manufacturer shall be used in each particular navigation lights to avoid reduction of performance due to unsuitable lamps.

17.8 Special requirements for lights using LEDs[34]

17.8.1 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 shall 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

[34] See IMO Resolution MSC.235(83)

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.

17.9 Additional Equivalence Considerations

17.9.1 None

18 MISCELLANEOUS EQUIPMENT

18.1 Nautical Publications

18.1.1 Every vessel shall carry nautical charts and nautical publications to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage.

18.1.2 Where this function is partly or fully filled by Electronic Chart Display and Information System (ECDIS), back-up arrangements to meet these functional requirements shall be provided as follows:

.1 Vessels of 3,000 gross tonnage and upwards shall be fitted with an ECDIS in accordance with 17.5.2 as follows:

i. 1 x ECDIS unit and 1 x paper chart folio; or

ii. 2 x ECDIS units which shall both work independently. The second ECDIS unit shall be connected to an independent power supply and a separate Global Navigation Satellite System (GNSS) position input.

.2 Vessels under 3,000 gross tonnage shall use one of the following options to meet the chart carriage requirements as follows:

i. 1 x paper chart folio;

ii. 1 x ECDIS unit and 1 x paper chart folio; or

iii. 2 x ECDIS units which shall both work independently. The second ECDIS unit shall be connected to an independent power supply and a separate Global Navigation Satellite System (GNSS) position input.

NOTE – if ECDIS is fitted onboard it shall be type approved.

18.1.3 Where paper charts are used in accordance with 18.1.2.1 and 18.1.2.2, there shall be provided, a chart table or area to lay out a chart with minimum dimensions 1070 millimetres by 720 millimetres to permit a standard British Admiralty paper chart to be laid out flat for the recording of appropriate position fixes and associated navigation workings. This area shall be located either on or in the vicinity of the bridge to the satisfaction of the BMA having regard for the type of vessel and suitable lighting shall be over the table with red lights for night work.

18.2 Measuring Instruments

18.2.1 Every vessel shall carry a barometer. Every sailing vessel shall carry an anemometer and an inclinometer.

18.3 Signalling Lamp

18.3.1 Every vessel shall carry a daylight signalling lamp, or other means to communicate by light during day and night using an energy source of electrical power not solely

dependent upon the ship's power supply. The signalling lamp may be the searchlight required by section 18.4. A spare bulb shall be carried for the signalling lamp.

18.4 Searchlight

18.4.1 Every vessel shall carry an efficient fixed or portable searchlight suitable for man-overboard search and rescue operations.

18.5 Radar reflectors

18.5.1 Vessels of less than 150 GT shall have a radar reflector.

18.6 Vessel IMO Number

18.6.1 Vessels of 300GT and above shall be permanently marked externally with the vessel's IMO number. This number shall be visible on either side of the hull or on the stern or on a horizontal surface visible from the air.

18.7 Portable Atmosphere Testing Instrument or Instruments

18.7.1 Every vessel 500GT and above shall carry an appropriate portable atmosphere testing instrument or instruments[35]. As a minimum, these shall be capable of measuring concentrations of oxygen, flammable gases or vapours, hydrogen sulphide and carbon monoxide prior to entry into enclosed spaces[36].

18.7.2 Suitable means shall be provided for the calibration of all such instruments which may be achieved by portable atmosphere testing instruments being calibrated onboard or ashore in accordance with the manufacturer's instructions.

18.7.3 Vessels under 500GT where enclosed spaces are accessible to the crew, shall comply with Section 18.7.1.

18.8 Additional Equivalence Considerations

18.8.1 None

[35] Refer to the Guidelines to facilitate the selection of portable atmosphere testing instruments for enclosed spaces as required by SOLAS XI-1/7 (MSC.1/Circ.1477).

[36] Refer to the Revised recommendations for entering enclosed spaces aboard ships (resolution A.1050(27))

19 ANCHORS AND CABLES

19.1 Equipment

19.1.1 Vessels will be considered to have adequate equipment if fitted out in accordance with standards for such equipment, set by a Recognised Organisation and holding relevant Class notation.

19.1.2 Vessels not equipped in accordance with section 19.1.1 may be specially considered by the BMA, provided full information is submitted for approval.

19.1.3 All vessels shall have at least 2 anchors. The anchors may be secured for sea but shall be available for use at short notice and anchors shall be available for immediate use during coastal and port transits. Any powered deployment system shall be connected to an emergency power supply or be capable of being manually operated.

19.2 Additional Equivalence Considerations

19.2.1 None.

20 ACCOMMODATION AND RECREATIONAL FACILITIES

PART A – VESSELS OF LESS THAN 200GT THAT DO NOT TRADE INTERNATIONALLY

20.1 General

20.1.1 An adequate standard of accommodation shall be provided to ensure the comfort, recreation, health and safety of all persons on board. Due consideration shall be given to the number of hotel and other support staff required.

20.1.2 Attention is drawn to the achievement of appropriate standards for means of access and escape, lighting, heating, food preparation and storage, messing, safety of movement about the vessel, ventilation and water services.

20.1.3 Generally, accommodation standards for the crew should be at least equivalent to the standards set by the Maritime Labour Convention, 2006. The provisions shall be practicable with regard to vessels greater than 500GT. For smaller vessels, particularly sailing vessels, the standards shall be applied where possible. When it is neither reasonable nor practicable to site crew sleeping accommodation amidships or aft and above the deepest waterline as required, measures taken to ensure an equivalent level of crew health and safety shall be agreed with the BMA. Sleeping accommodation with the deckhead lining below the deepest waterline is not permitted. It is recommended that where such accommodation is sited partially below the deepest waterline it should be arranged such that in the event of damage to the watertight compartment in which the accommodation space is situated, the lining shall not be immersed.

20.1.4 Crew accommodation shall not be sited within hazardous spaces. The following standards are described by general principles which need to be expanded to meet the requirements which relate to the use and areas of operation of particular vessels.

20.2 Lighting

20.2.1 An electric lighting system shall be installed which is capable of supplying adequate light to all enclosed accommodation and working spaces. The system should be designed and installed in accordance with section 8.

20.3 Heating

20.3.1 As considered appropriate, an adequate heating installation shall be provided.

20.4 Food Preparation, Storage and Messing

20.4.1 The galley floor shall be provided with a non-slip surface and provide a good foothold.

20.4.2 All furniture and fittings in the galley shall be made of a material which is impervious to dirt and moisture. All metal parts of furniture and fittings shall be rust resistant.

20.4.3 The ventilation in the galley shall be so arranged as to ensure an adequate supply of fresh air and the efficient discharge of fumes into the open air (see also section 20.6).

20.4.4 When a cooking appliance is gimballed it shall be protected by a crash bar or other means to prevent personal injury. Means shall be provided to lock the gimbal mechanism.

20.4.5 Means shall be provided to allow the cook to be secured in position, with both hands free for working, when the vessel motions threaten safe working.

20.4.6 Secure and hygienic storage for food and garbage shall be provided.

20.4.7 A messing area(s) shall be provided. Each messing area shall be large enough to accommodate the greatest number of persons likely to use it at any one time.

20.5 Hand Holds and Grab Rails

20.5.1 There shall be sufficient hand holds and grab rails within the accommodation to allow safe movement around the accommodation at all times. Stairways shall be specially considered.

20.6 Ventilation

20.6.1 Effective means of ventilation shall be provided to all enclosed spaces which are entered by personnel.

20.6.2 Mechanical ventilation shall be provided to all accommodation spaces on vessels which are intended to make long international voyages or operate in tropical waters. As a minimum, mechanical ventilation shall be capable of providing 6 changes of air per hour, when all access and other openings (other than ventilation intakes) to the spaces are closed.

20.6.3 Air conditioning systems shall provide a minimum of $25m^3$ of air per hour, per person accommodated in the ventilated space during normal operating conditions.

20.6.4 Enclosed galleys shall be specially considered, and where air conditioning is not fitted shall have, as a minimum, a mechanical supply of 20 fresh air changes per hour and a mechanical exhaust of 30 changes.

20.7 Water Services

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

20.7.2 In addition, an emergency reserve supply of drinking water shall be carried, sufficient to provide at least 2 litres per person. The installation of fresh water making machines and disinfection arrangements shall be to the acceptance of the BMA (for the purposes of this, silver ionisation or chlorination would be considered acceptable).

20.8 Sleeping Accommodation

20.8.1 An appropriately sized bed (bunk or cot) shall be provided for every person on board, having a minimum inside dimension of either:

.1 not less than 190 centimetres by 70 centimetres, with no tapering, where the BMA is satisfied that that this is reasonable and shall not result in discomfort to the seafarers; or

.2 not less than 198 centimetres in length and not less than 80 centimetres in width over half the length of the berth. A taper is permitted from half the length of the berth towards the foot of the berth but under no circumstances is the berth permitted to be narrower at any point than 50 centimetres;

.3 where considered appropriate, means for preventing the occupants from falling out, shall be provided. There shall be no direct access into sleeping rooms from spaces for machinery, galleys, paint rooms or from engine, deck, and other bulk storerooms, drying rooms, communal wash places or water closets.

20.8.2 In crew accommodation, wherever possible, the maximum number of persons per sleeping room shall be two and there shall be unobstructed access to at least one side of each bed. Any increase in the maximum number of persons per sleeping room shall be agreed with the BMA.

20.9 Toilet Facilities

20.9.1 Adequate sanitary toilet facilities shall be provided on board. The facilities shall be at least one water closet and one shower for every 8 persons or part thereof, and one wash basin for every 6 persons or part thereof.

20.9.2 In vessels where a sanitary system, including a holding tank, is provided, care shall be taken to ensure that there is no possibility of fumes from the tank returning via a toilet should the water seal at the toilet be broken.

20.10 Stowage Facilities for Personal Effects

20.10.1 Adequate stowage facilities for clothing and personal effects shall be provided for every person on board.

20.11 Securing of Heavy Equipment

20.11.1 All heavy items of equipment such as ballast, batteries, cooking stove, etc, shall be securely fastened in place. All stowage lockers containing heavy items shall have lids or doors which are capable of being securely fastened.

PART B - VESSELS OF LESS THAN 200GT

20.12 General

20.12.1 Vessels of less than 200GT that do not trade internationally are excepted from the requirements of this Part and shall comply with Part A.

20.12.2 Accommodation shall provide decent living conditions and recreational facilities for those persons employed or engaged in any work capacity onboard. Due consideration shall be given to likely numbers of hotel and support staff onboard.

20.12.3 In order to provide decent living conditions and recreational facilities the following requirements are provided as minimum standards.

20.12.4 The materials used to construct internal bulkheads, panelling and sheeting, floors and joinings shall be suitable for the purpose and conducive to ensuring a healthy environment.

20.12.5 Excessive noise and vibration shall be limited within accommodation spaces, and as far as practicable in accordance with relevant international standards. Where the seafarers' exposure to noise and vibration is very time limited in accommodation spaces, alternative arrangements may be accepted.

20.13 Access/Escape Arrangements

20.13.1 Refer to Section 14.11 for details.

20.14 Headroom

20.14.1 There shall be adequate and reasonable headroom for all seafarers onboard taking into consideration the size and operation of vessel. Headroom provided shall not result in discomfort to the seafarers onboard.

20.14.2 For spaces where seafarers are expected to stand for prolonged periods, the minimum headroom shall be 190 centimetres. The competent authority may allow reduced height in some locations if it does not result in discomfort to seafarers.

20.15 Ventilation

20.15.1 Effective means of ventilation shall be provided to all enclosed spaces which are entered by personnel.

20.15.2 Mechanical ventilation shall be provided to all accommodation spaces on vessels which are intended to make long international voyages or operate in tropical waters. As a minimum, mechanical ventilation shall be capable of providing 6 changes of air per hour, when all access and other openings (other than ventilation intakes) to the spaces are closed.

20.15.3 Air conditioning - recirculation of supply air may be permitted provided that sanitary accommodation is provided with mechanical exhaust ventilation and that the fresh air content of the supply to the accommodation is not less than:

.1 25 cubic metres per hour for each person for whom accommodation is provided; or

.2 the total capacity of the sanitary and any other accommodation exhaust fans, excluding the galley, whichever is the greater.

20.15.4 Enclosed galleys shall be specially considered, and where air conditioning is not fitted shall have, as a minimum, a mechanical supply of 20 fresh air changes per hour and a mechanical exhaust of 30 changes.

20.15.5 In spaces where sanitary facilities are provided there shall be ventilation that draws from the accommodation and extracts to the open air independent of the other parts of the accommodation.

20.16 Heating and Insulation

20.16.1 All accommodation spaces shall be adequately heated, taking into account climatic conditions. The accommodation shall be adequately insulated.

20.17 Lighting

20.17.1 An electric lighting system shall be installed which is capable of supplying adequate light to all enclosed accommodation and working spaces. The system shall be designed and installed in accordance with Section 8.

20.17.2 Seafarer's sleeping rooms and mess rooms shall be lit by natural light and provided with adequate artificial light. Where the provision of natural light is impracticable, adequate artificial light may be acceptable in limited areas.

20.18 Water Services and Provision

20.18.1 Hot and cold running fresh water shall be available in all wash places.

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

20.18.3 In addition, an emergency reserve supply of drinking water shall be carried, sufficient to provide at least 2 litres per person. The installation of fresh water making machines and disinfection arrangements shall be to the acceptance of the BMA (for this purpose silver ionisation or chlorination would be considered acceptable).

20.19 Galley Facilities and Provision of Food

20.19.1 Adequate food shall be provided for all seafarers onboard free of charge. The provision of food shall take account of the seafarers' religious requirements and cultural practices, the nature and duration of the voyage, and shall be suitable in respect of quantity, nutritional value, quality and variety.

20.19.2 The organisation and equipment of the catering department shall be such as to permit the provision to the seafarers of adequate, varied and nutritious meals prepared and served in hygienic conditions. This shall include as a minimum that the galley is fitted with a means of cooking and a sink and have adequate working surface for the preparation of food. The galley floor shall be provided with a non-slip surface and provide a good foothold.

20.19.3 All furniture and fittings in the galley shall be made of a material which is impervious to dirt and moisture. All metal parts of furniture and fittings shall be rust resistant.

20.19.4 The ventilation in the galley shall be arranged to ensure that there is an adequate supply of fresh air and for the efficient discharge of fumes into the open air (see also 20.15.4).

20.19.5 When a cooking appliance is gimballed it shall be protected by a crash bar or other means to prevent personal injury. Means shall be provided to lock the gimballing mechanism.

20.19.6 Means shall be provided to allow the cook to be secured in position, with both hands free for working, when the vessel motions threaten safe working.

20.19.7 Secure and hygienic storage for food and garbage shall be provided.

20.19.8 A messing area(s) shall be provided, each messing area shall be large enough to accommodate the greatest number of persons likely to use it at any one time.

20.20 Hand Holds and Grab Rails

20.20.1 There shall be sufficient hand holds and grab rails within the accommodation to allow safe movement around the accommodation at all times. Stairways shall be specially considered.

20.21 Sleeping Accommodation

20.21.1 Sleeping accommodation shall be of adequate size and properly equipped so as to ensure reasonable comfort and to facilitate tidiness.

20.21.2 There shall be no direct access into sleeping rooms from spaces for machinery, galleys, storerooms, drying rooms, or communal sanitary areas.

20.21.3 In seafarer accommodation, wherever possible, the maximum number of persons per sleeping room shall be two and there shall be unobstructed access to at least one side of each bed. Any increase in the maximum number of persons per sleeping room shall be agreed with the BMA.

20.21.4 Sleeping accommodation shall be situated or equipped, as practicable, so as to provide appropriate levels of privacy for men and for women.

20.21.5 Berths for seafarers shall have a minimum inside dimension of either:

.1 not less than 190 centimetres by 70 centimetres, with no tapering, where it is satisfied that that this is reasonable and shall not result in discomfort to the seafarers; or

.2 not less than 198 centimetres in length and not less than 80 centimetres in width over half the length of the berth. A taper is permitted from half the length of the berth towards the foot of the berth but under no circumstances is the berth permitted to be narrower at any point than 50 centimetres.

20.21.6 Where considered appropriate, means for preventing the occupants from falling out, shall be provided.

20.21.7 Sleeping rooms shall be situated above the load line/freeboard mark amidships or aft (or the maximum loaded displacement where no load line/freeboard mark is provided), but in no case forward of the collision bulkhead.

20.21.8 Where it is not possible to provide sleeping accommodation above the load line/freeboard mark (or the maximum loaded displacement where no load line/freeboard mark is provided) as required by 20.21.7, there shall be an alarm fitted to provide early warning of flooding that alerts occupants of the sleeping accommodation and provides them with sufficient time to escape from the accommodation.

20.22 Sanitary Facilities

20.22.1 There shall be at least one set of sanitary facilities for each 6 seafarers onboard, separated from the rest of the accommodation. Each set of sanitary facilities shall include one shower or one tub, one wash basin and one toilet. Each set of sanitary facilities shall be provided with a door that is lockable. Where reasonable and practicable there shall be separate sanitary facilities provided for men and for women.

20.22.2 In vessels where a sanitary system, including a holding tank, is provided, care shall be taken to ensure that there is no possibility of fumes from the tank finding their way back to a toilet, should the water seal at the toilet be broken.

20.23 Mess Rooms

20.23.1 Mess rooms shall be of adequate size and comfort and properly furnished and equipped (including ongoing facilities for refreshment), taking account of the number of seafarers likely to use them at any one time. It may be that the mess shall be a shared facility for seafarers and passengers; this shall be subject to agreement by the BMA.

20.24 Recreational Facilities

20.24.1 Appropriate seafarers' recreational facilities, amenities and services, as adapted to meet the special needs of seafarers who shall live and work onboard, shall be provided.

20.24.2 All vessels shall have a space or spaces on open deck to which the seafarers can have safe access when off duty, which are of adequate area having regard to the size of the ship and the number of seafarers on board and are protected from the elements. Due consideration shall be given to any areas of deck which may be considered as posing a safety risk to seafarers. Such spaces may be shared with the passengers onboard.

20.25 Stowage Facilities for Personal Effects

20.25.1 Each seafarer shall be provided with adequate storage space for personal effects which shall be a minimum of 125 litres per seafarer.

20.26 Machinery Space Boundaries

20.26.1 Where machinery spaces are adjacent to accommodation spaces, the boundaries shall be designed to be gas tight. The requirement to be gas-tight is taken to mean that bulkheads shall be so constructed as to prevent ingress of water and noxious gases into adjacent cabins as far as is reasonable and practicable to do so.

20.26.2 Machinery space boundaries shall retain any liquids which may leak from the equipment within the machinery space.

20.27 Securing of Heavy Equipment

20.27.1 All heavy items of equipment such as ballast, batteries, cooking stove, etc, shall be securely fastened in place. All stowage lockers containing heavy items shall have lids or doors which are capable of being securely fastened.

20.28 Protection from Mosquitoes

20.28.1 Vessels regularly trading to and within mosquito infested ports shall be fitted with appropriate devices to protect seafarers from mosquitos, as agreed by the BMA

20.29 Master's Inspections

20.29.1 There shall be weekly documented inspections carried out onboard vessels, by or under the authority of the Master, with respect to:

.1 supplies of food and drinking water;

.2 all spaces and equipment used for the storage and handling of food and drinking water;

.3 galley and other equipment used for the preparation and service of meals; and

.4 that seafarer accommodation is clean, decently habitable and maintained in a good state of repair.

20.29.2 The results of each inspection shall be recorded and made available for review.

PART C - VESSELS OF 200GT AND ABOVE

20.30 Introduction

20.30.1 This Part applies to vessels of 200GT and above, the keel of which was laid or was at a similar stage of construction, on or after the date of entry into force of the MLC (20 August 2013).

20.30.2 When agreed with the BMA, vessels which are of traditional build and are true replicas of traditionally designed yachts, which includes wooden yachts, 'J Class' yachts and other yachts of similar design where their traditional character is incompatible with the detailed accommodation requirements, particularly with regard to cabin size, are excepted from the requirements of this Part and shall comply with Part A.

20.31 General

20.31.1 Accommodation shall provide decent living conditions and recreational facilities for all seafarers onboard the vessel. Due consideration shall be given to likely numbers of hotel and support staff onboard

20.31.2 In order to provide decent living conditions and recreational facilities the following requirements are provided as minimum standards.

20.31.3 The materials used to construct internal bulkheads, panelling and sheeting, floors and joinings shall be suitable for the purpose and conducive to ensuring a healthy environment. All relevant health and safety standards shall be observed.

20.31.4 The accommodation shall be adequately insulated; proper lighting and sufficient drainage shall be provided.

20.31.5 There shall be no direct openings into sleeping rooms from machinery spaces, galleys, storerooms, drying rooms or communal sanitary areas. That part of a bulkhead separating such places from sleeping rooms and external bulkheads shall be efficiently constructed of steel or other approved material and be watertight and gas-tight. The requirement to be watertight and gas-tight is taken to mean that bulkheads shall be so constructed as to prevent ingress of water, cooking smells, and noxious gases into adjacent cabins.

20.32 Headroom

20.32.1 There shall be adequate headroom in all seafarer accommodation. The minimum permitted headroom in all seafarer accommodation where full and free movement is necessary shall be not less than 203 centimetres. Some limited reduction in headroom in any space, or part of any space, in such accommodation

may be permitted, provided this is reasonable and does not result in discomfort to the seafarer and is agreed with the BMA.

20.33 Access/Escape arrangements

20.33.1 See Sections 14.11 and 14.21 for details.

20.34 Lighting

20.34.1 Seafarer's sleeping rooms and mess rooms shall be lit by natural light and provided with adequate artificial light. Where the provision of natural light is impracticable, adequate artificial light may be acceptable in limited areas.

20.35 Heating

20.35.1 Adequate heat through an appropriate heating system shall be provided, except in vessels exclusively operating in tropical climates.

20.36 Ventilation

20.36.1 Sleeping rooms and mess rooms shall be adequately ventilated. Vessels, except those regularly operating in areas where temperate climatic conditions do not require this, shall be equipped with air conditioning for seafarer accommodation, for any separate radio room and for any centralised machinery control room. All sanitary spaces shall have ventilation that draws from the accommodation and extracts to the open air, independently of any other part of the accommodation.

20.36.2 Mechanical ventilation shall be provided to all accommodation spaces on vessels which are intended to make long international voyages or operate in tropical waters. As a minimum, mechanical ventilation shall be capable of providing 6 changes of air per hour, when all access and other openings (other than ventilation intakes) to the spaces are closed.

20.36.3 Air conditioning - recirculation of supply air may be permitted provided that sanitary accommodation is provided with mechanical exhaust ventilation and that the fresh air content of the supply to the accommodation is not less than:

.1 25 cubic metres per hour for each person for whom accommodation is provided; or

.2 the total capacity of the sanitary and any other accommodation exhaust fans, excluding the galley, whichever is the greater.

20.37 Sleeping Accommodation

20.37.1 General

.1 The sleeping accommodation shall meet 20.37.2 (the requirements for sleeping accommodation of the MLC for vessels up to 3,000GT).

.2 Where it is not practicable to meet 20.37.2 the sleeping accommodation shall meet the substantially equivalent requirements of:

i. 20.37.3 for vessels of 200GT and above and less than 500GT;
ii. 20.37.4 for vessels of 500GT and above and less than 1,250GT;
iii. 20.37.5 for vessels of 3,000GT and above and less than 5,000GT:
iv. 20.37.6 for vessels of 5,000 GT and above.

.3 Sleeping accommodation shall be of adequate size and properly equipped so as to ensure reasonable comfort and to facilitate tidiness.

20.37.2 Sleeping Accommodation for Vessels up to 3,000GT:

.1 Sleeping rooms shall be situated above the deepest waterline amidships or aft. Where this is impractical, sleeping rooms may be located in the fore part of the vessel, but in no case forward of the collision bulkhead nor immediately beneath working alleyways[37].

.2 When it is neither reasonable nor practicable to site seafarer sleeping accommodation amidships or aft, and above the deepest waterline as required, measures taken to ensure an equivalent level of seafarer health and safety shall

.3 be agreed with the BMA. Where the sole of the sleeping accommodation is below the deepest waterline amidships, a bilge flooding alarm shall be provided in the sleeping accommodation to provide early warning of flooding to that compartment. Sleeping accommodation with the deck head lining below the deepest intact waterline is not permitted. In addition, for vessels other than short range yachts, where such accommodation is sited partially below the deepest waterline it shall be arranged such that in the event of damage to the watertight compartment in which the accommodation space is situated, the deck head lining shall not be immersed. Satisfactory arrangements shall be made for lighting and ventilation.

.4 Separate sleeping rooms shall be provided for men and for women.

.5 A separate berth for each seafarer shall in all circumstances be provided. The minimum inside dimensions of a berth shall not be less than 198 centimetres in length and not less than 80 centimetres in width over half the length of the berth. A taper is permitted from half the length of the berth towards the foot of the berth but under no circumstances is the berth permitted to be narrower at any point than 50 centimetres.

.6 The master, the chief engineer and the chief navigating officer shall have, in addition to their sleeping rooms, an adjoining sitting room, day room or equivalent additional space. Where this not practicable, an alternative comfortable shared sitting area may be provided. Such a space shall allow such officers to meet privately, or to meet with other seafarers privately. The Navigating Bridge, if suitably fitted, may be considered if it

[37] Sleeping rooms shall not be subject excessive noise or vibration which may affect the seafarer's ability to rest

is available for this exclusive use when the ship is not engaged in navigation. When the ship is engaged in navigation, the watchkeepers shall not be distracted.

.7 Every seafarer shall be provided with a clothes locker of ample space (minimum 475 litres) and a drawer or equivalent space of not less than 56 litres. If the drawer is incorporated in the clothes locker then the combined minimum volume of the clothes locker shall be 500 litres. The locker shall be fitted with a shelf and be able to be locked by the seafarer so as to ensure security and maintain privacy. Where the total required volume cannot be provided within the cabin, the BMA may consider accepting secure facilities for the individual elsewhere within the seafarer accommodation, provided that within the cabin a minimum of 300 litres storage space is provided for each individual seafarer.

.8 Sleeping rooms shall be provided with a table or desk, which may be of the fixed, drop-leaf or slide-out type or other alternative table, and with comfortable seating accommodation as necessary.

.9 In calculating the floor area of sleeping rooms, spaces occupied by berths, lockers, seats, chests of drawers and other furniture shall be included in the area but spaces which by reason of their small size or irregular shape cannot accommodate furniture and do not contribute to the area available for free movement shall not be included. Where a berth or other fixed furniture is situated at the side of the vessel the projected area (to floor level) of such berths or fixed furniture may be used in the calculation of the sleeping room area.

.10 To the extent possible an individual sleeping room shall be provided for each seafarer, the floor area of which shall not be less than 4.5 square metres. This minimum floor area may include en-suite sanitary facilities where provided.

.11 Where it is not practical to provide single occupancy cabins, sleeping rooms to be occupied by a maximum of two seafarers may be accepted, provided that the floor area of such sleeping rooms is not less than 7 square metres. The floor area may include en suite sanitary facilities, if provided.

.12 The floor area for sleeping rooms for seafarers who are officers on vessels where an adjoining sitting room, day room or equivalent additional space is provided shall not be less than 4.5 square metres per seafarer. This area may include en-suite sanitary facilities. It is not expected that seafarers who are officers shall be required to share a cabin.

.13 The floor area for sleeping rooms for seafarers who are officers on vessels where no adjoining sitting room, day room or equivalent additional space is provided shall not be less than 7.5 square metres per seafarer. This area may include en-suite sanitary facilities. It is not

expected that seafarers who are officers shall be required to share a cabin.

20.37.3 Sleeping Accommodation for Vessels of 200GT and above and less than 500GT:

.1 Sleeping rooms shall be situated above the deepest waterline amidships or aft where practicable. Where this is impractical, sleeping rooms may be located in the fore part of the vessel, but in no case forward of the collision bulkhead nor immediately beneath working alleyways[38].

.2 When it is neither reasonable nor practicable to site seafarer sleeping accommodation amidships or aft, and above the deepest waterline as required, measures taken to ensure an equivalent level of seafarer health and safety shall be agreed with the BMA. Where the sole of the sleeping accommodation is below the deepest waterline amidships, a bilge flooding alarm shall be provided in the cabin to provide early warning of flooding to that compartment. Sleeping accommodation with the deck head lining below the deepest intact waterline is not permitted. In addition, for vessels other than short range yachts, where such accommodation is sited partially below the deepest waterline it shall be arranged such that in the event of damage to the watertight compartment in which the accommodation space is situated, the deck head lining shall not be immersed. Satisfactory arrangements shall be made for lighting and ventilation.

.3 Separate sleeping rooms shall be provided for men and for women.

.4 A separate berth for each seafarer shall in all circumstances be provided. The minimum inside dimensions of a berth shall be at least 198 centimetres by 80 centimetres. Narrower berths may be permitted in either (a) sleeping rooms occupied by only one seafarer or (b) sleeping rooms where en-suite sanitary facilities are provided – in such cases the minimum inside dimensions of a berth shall not be less than 198 centimetres in length and not less than 80 centimetres in width over half the length of the berth. A taper is permitted from half the length of the berth towards the foot of the berth but under no circumstances is the berth permitted to be narrower at any point than 50 centimetres.

.5 Where practical, the master, the chief engineer and the chief navigating officer shall have, in addition to their sleeping rooms, an adjoining sitting room, day room or equivalent additional space. Where this not practicable, an alternative comfortable shared sitting area may be provided. Such a space shall allow such officers to meet privately, or to meet with other seafarers privately. The Navigating Bridge, if suitably fitted, may be considered if it is available for this exclusive use when the

[38] Sleeping rooms shall not be subject excessive noise or vibration which may affect the seafarer's ability to rest

ship is not engaged in navigation. When the ship is engaged in navigation, the watchkeepers shall not be distracted.

.6 Every seafarer shall be provided with a clothes locker of ample space (minimum 475 litres) and a drawer or equivalent space of not less than 56 litres. If the drawer is incorporated in the clothes locker then the combined minimum volume of the clothes locker shall be 500 litres. The locker shall be fitted with a shelf and be able to be locked by the seafarer so as to ensure security and maintain privacy. Where the total required volume cannot be provided within the cabin, the BMA may consider accepting secure facilities for the individual elsewhere within the seafarer accommodation, provided that within the cabin a minimum of 300 litres storage space is provided for each individual seafarer.

.7 Sleeping rooms shall be provided with a table or desk, which may be of the fixed, drop-leaf or slide-out type or other alternative table, and with comfortable seating accommodation as necessary.

.8 Where a single berth seafarer's cabin without en-suite sanitary facilities is provided it shall have a floor area of not less than 3.6 square metres.

.9 A single berth seafarer's cabin provided with en-suite sanitary facilities, shall have a floor area of not less than 4.5 square metres. En-suite sanitary facilities are considered to compensate for reduced floor area and form part of the floor area.

.10 Sleeping rooms occupied by two seafarers without en-suite sanitary facilities shall have a floor area of not less than 7 square metres.

.11 A cabin occupied by two seafarers where en-suite sanitary facilities are provided shall have a minimum floor area of 6.2 square metres. En-suite sanitary facilities are considered to compensate for reduced floor area and form part of the floor area.

.12 Where the reduced floor areas in 20.37.3.8 to 20.37.3.11 are adopted, the free floor area in the sleeping accommodation shall be at least 1.45 square metres per seafarer to provide for sufficient comfortable movement.

.13 Where the requirement of 20.37.3.12 is not practical due to the hull shape or hull stiffening, but the arrangements in the cabin allow for a free movement of the upper part of the body equivalent to an area of 1.45 square metres, a reduced free floor area may be provided with the BMA's agreement, but shall not be less than 1 square metre per seafarer.

.14 Where the requirements of 20.37.3.13 are accepted by the BMA, the en-suite sanitary facilities shall be large enough to allow for the facilities to be used with the door closed and would not be expected to have a floor area of less than 1.2 square metres. Where the floor area of the en-suite sanitary facilities provided is greater than 1.2 square metres, the free floor area of the cabin may be reduced accordingly but shall never be less than 1 square metre per seafarer.

20.37.4 Sleeping Accommodation for Vessels of 500GT and above and less than 1,250GT:

.1 Sleeping rooms shall be situated above the deepest waterline amidships or aft where practicable. Where this is impractical, sleeping rooms may be located in the fore part of the vessel, but in no case forward of the collision bulkhead nor immediately beneath working alleyways[39].

.2 When it is neither reasonable nor practicable to site seafarer sleeping accommodation amidships or aft, and above the deepest waterline as required, measures taken to ensure an equivalent level of seafarer health and safety shall be agreed with the BMA. Where the sole of the sleeping accommodation is below the deepest waterline amidships, a bilge flooding alarm shall be provided in the cabin to provide early warning of flooding to that compartment. Sleeping accommodation with the deck head lining below the deepest intact waterline is not permitted. In addition, where such accommodation is sited partially below the deepest waterline it shall be arranged such that in the event of damage to the watertight compartment in which the accommodation space is situated, the deck head lining shall not be immersed. Satisfactory arrangements shall be made for lighting and ventilation.

.3 Separate sleeping rooms shall be provided for men and for women.

.4 A separate berth for each seafarer shall in all circumstances be provided. The minimum inside dimensions of a berth shall be at least 198 centimetres by 80 centimetres. Narrower berths may be permitted in either (a) sleeping rooms occupied by only one seafarer or (b) sleeping rooms where en-suite sanitary facilities are provided – in such cases the minimum inside dimensions of a berth shall not be less than 198 centimetres in length and not less than 80 centimetres in width over half the length of the berth. A taper is permitted from half the length of the berth towards the foot of the berth but under no circumstances is the berth permitted to be narrower at any point than 50 centimetres.

.5 Where practical, the master, the chief engineer and the chief navigating officer shall have, in addition to their sleeping rooms, an adjoining sitting room, day room or equivalent additional space. If an adjoining sitting room, day room or equivalent additional space is provided the minimum floor area of the cabin shall not be less than 4.5 square metres. If there is no dayroom provided see 20.37.4.14.

.6 Every seafarer shall be provided with a clothes locker of ample space (minimum 475 litres) and a drawer or equivalent space of not less than 56 litres. If the drawer is incorporated in the clothes locker then the combined minimum volume of the clothes locker shall be 500 litres. The

[39] Sleeping rooms shall not be subject excessive noise or vibration which may affect the seafarer's ability to rest

locker shall be fitted with a shelf and be able to be locked by the seafarer so as to ensure security and maintain privacy. Where the total required volume cannot be provided within the cabin, the BMA may consider accepting secure facilities for the individual elsewhere within the seafarer accommodation, provided that within the cabin a minimum of 300 litres storage space is provided for each individual seafarer.

.7 Sleeping rooms shall be provided with a table or desk, which may be of the fixed, drop-leaf or slide-out type or other alternative table, and with comfortable seating accommodation as necessary.

.8 Where a single berth seafarer's cabin without en-suite sanitary facilities is provided it shall have a floor area of not less than 3.6 square metres.

.9 A single berth seafarer's cabin provided with en-suite sanitary facilities, shall have a floor area of not less than 4.5 square metres. En-suite sanitary facilities are considered to compensate for reduced floor area and form part of the floor area.

.10 Sleeping rooms occupied by two seafarers without en-suite sanitary facilities shall have a floor area of not less than 7 square metres.

.11 Single occupancy cabins for seafarers who are officers for whom no adjoining sitting room, day room or equivalent additional space are provided shall be not less than 4.5 square metres for a vessel of 500GT and not less than 7.5 square metres for vessels of 1,250GT and above. For a vessel of intermediate gross tonnage, the floor area shall be determined by linear interpolation, as shown in Figure 20.30 below. En-suite sanitary facilities are considered to compensate for reduced floor area and form part of the floor area.

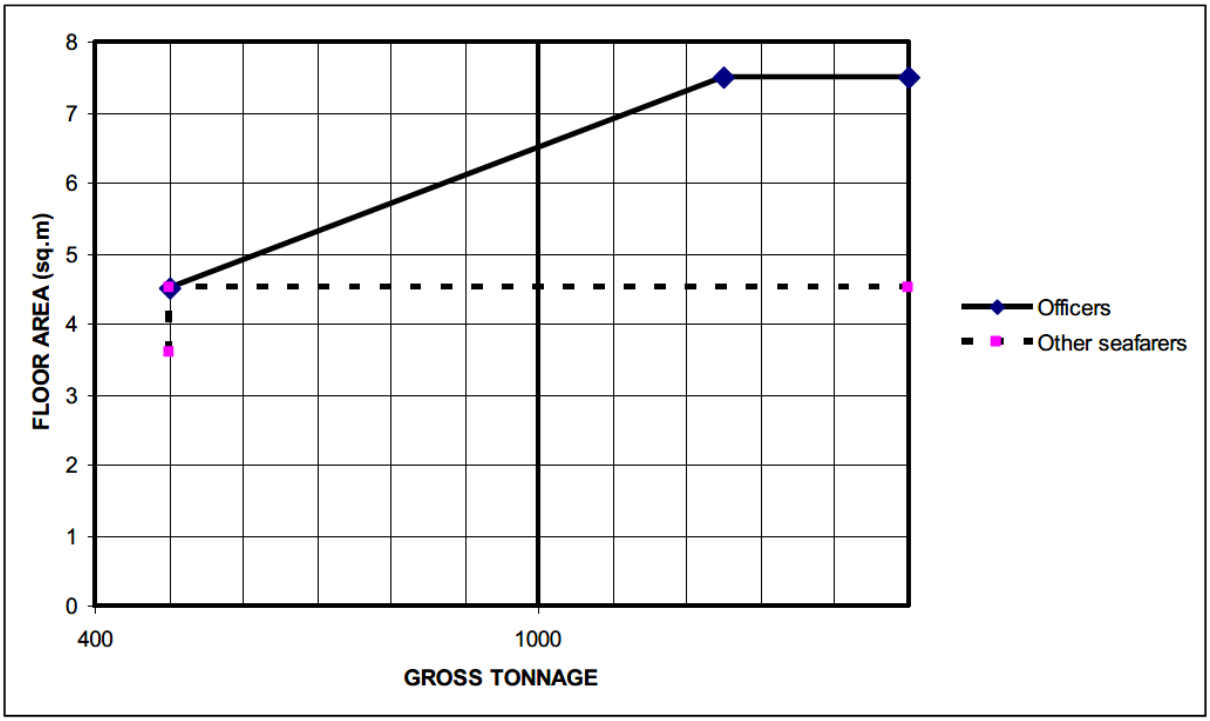


Figure 20.30 – Cabin Floor Areas – Single Occupancy

.12 Floor areas of double occupancy cabins with en-suite sanitary facilities for seafarers who are officers for whom no adjoining sitting room, day room or equivalent additional space are provided shall be not less than 6.2 square metres for a vessel of 500GT and not less than 15 square metres for vessels of 1,250GT and above. For a vessel of intermediate gross tonnage, the floor area shall be determined by linear interpolation, as shown in Figure 20.31 below. For seafarers who are not officers, the floor area of a double occupancy cabin with en-suite sanitary facilities shall increase at the same rate as cabins provided for seafarers who are officers until it is 7 square metres.

.13 Officer's cabins with a floor area less than 7.5 square metres shall be provided with televisions and other suitable electronic audio-visual equipment.

.14 Where adjoining sitting rooms, day rooms or other equivalent additional spaces are not provided in accordance with 20.37.4.11 an additional space providing a comfortable shared sitting area for such officers shall be provided with a floor area of at least 1.5 square metres per officer. Such a space shall allow the seafarers who are officers to meet privately, or the seafarers who are officers to meet with other seafarers privately. The wheelhouse, if suitably fitted, may be considered if it is available for this exclusive use when the vessel is not engaged in navigation. When the ship is engaged in navigation, the watchkeepers shall not be distracted.

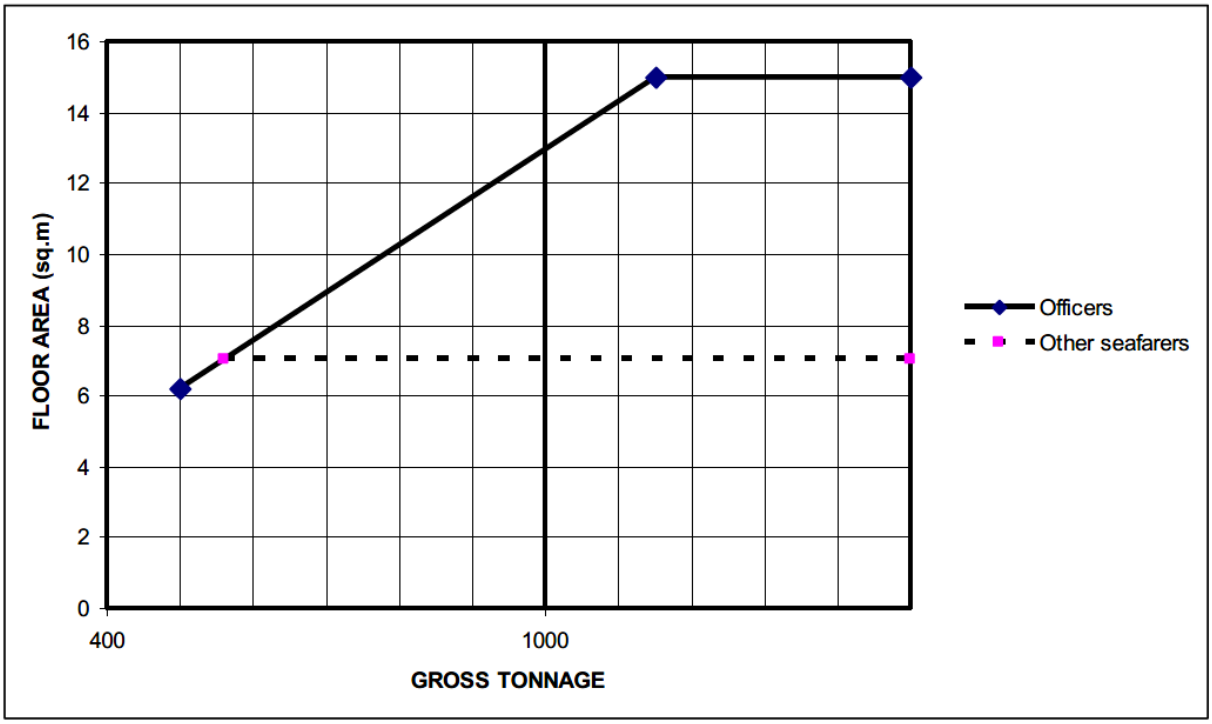


Figure 20.31 – Cabin Floor Areas – Double Occupancy

20.37.5 *Sleeping accommodation for vessels of 3,000GT and above and less than 5,000GT:*

.1 Vessels of 3,000GT and above and less than 5,000GT, constructed on or after 20 August 2012 shall comply with the full requirements of standard A3.1 of the MLC, except for the following equivalent arrangement to MLC standards A3.1.8, A3.1.9(a), (b) and (f), and A3.1.11(a) which may be followed:

i. All seafarers who are officers shall have their own cabin.

ii. No more than two seafarers not performing the duties of officers may be accommodated per cabin, in a twin cabin arrangement.

iii. Vessels shall be designed and crewed in such a way that cabins can be allocated by gender – i.e. there shall be no mixed gender cabins. This does not prevent a mixed gender couple voluntarily sharing a cabin in operation. The seafarer cabins shall be designed and shall only be approved as twin cabins, not as double cabins. There shall not be a compulsion in any way whatsoever for seafarers of different genders to share a cabin.

iv. There shall be a minimum cabin size for seafarers who are not performing the duties of officers who are provided with a twin cabin. Based on the MLC requirement for vessels of 3,000GT or over for 5.5 square metres of floor area per seafarer, the minimum floor area for such a cabin shall be no less than 11 square metres.

v. Each seafarer berth in a twin cabin shall be arranged longitudinally, i.e., so that it is a 'fore and aft' bunk. Bunks arranged athwartships shall not be permitted in twin cabins.

vi. Each twin cabin shall be provided with en-suite sanitary facilities. Each set of en-suite sanitary facilities shall meet the minimum requirements set out in the MLC for sanitary facilities, i.e. that they provide a WC, a basin and a shower or a bath tub. The floor area for en-suite sanitary facilities may be incorporated within the minimum 11 square metres floor area for each twin cabin.

vii. Each cabin shall be lit by natural light and shall be provided with artificial light. There shall be a minimum of one window providing natural light per cabin.

20.37.6 Sleeping Accommodation for Vessels of 5,000GT or more

.1 Vessels of 5,000GT or more constructed on or after the 20 August 2013 shall comply with the full requirements of standard A3.1 of the MLC.

20.38 Mess Rooms

20.38.1 Mess rooms shall be located apart from the sleeping rooms to avoid disturbing those persons sleeping and as close as practicable to the galley. Mess rooms shall be of adequate comfort and properly furnished and equipped (including ongoing facilities for refreshment), taking account of the number of seafarers likely to use them at any one time. Mess rooms for seafarers who are officers and other seafarers may be separate or common, as appropriate.

20.38.2 Where the substantially equivalent arrangements in Section 20.37.3 and 20.37.4 are used, the floor area of mess rooms for seafarers shall not be less than 1.5 square metres per person of the planned seating capacity.

20.39 Galley Areas, Food Preparation, Storage, and Provision of Food

20.39.1 Adequate food shall be provided for all seafarers onboard free of charge. The provision of food shall take account of the seafarers' religious requirements and cultural practices, the nature and duration of the voyage, and shall be suitable in respect of quantity, nutritional value, quality and variety.

20.39.2 The organisation and equipment of the catering department shall be such as to permit the provision to the seafarers of adequate, varied and nutritious meals prepared and served in hygienic conditions. This shall include as a minimum that the galley is fitted with a means of cooking and a sink and have adequate working surface for the preparation of food. The galley floor shall be provided with a non-slip surface and provide a good foothold.

20.39.3 All furniture and fittings in the galley shall be made to be impervious to dirt and moisture. All metal parts of furniture and fittings shall be rust resistant.

20.39.4 The ventilation in the galley shall be arranged to ensure that there is an adequate supply of fresh air and for the efficient discharge of fumes into the open air. Air conditioning systems shall provide a minimum of 25 cubic metres of air per hour, per person working in the ventilated space during normal operating conditions. Enclosed galleys shall be specially considered, and where air conditioning is not fitted shall have, as a minimum, a mechanical supply of 20 fresh air changes per hour and a mechanical exhaust of 30 changes per hour.

20.39.5 When a cooking appliance is gimballed it shall be protected by a crash bar or other means to prevent personal injury. Means shall be provided to lock the gimballing mechanism.

20.39.6 Means shall be provided to allow the person cooking to be secured in position, with both hands free for working, when the vessel motions threaten safe working. Secure and hygienic storage for food and garbage shall be provided.

20.40 Water Services

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

20.40.2 In addition, an emergency reserve supply of drinking water shall be carried, sufficient to provide at least 2 litres per person the vessel is certificated to carry. The installation of fresh water making machines and disinfection arrangements shall be to the acceptance of the BMA - for this purpose silver ionisation or chlorination would be considered acceptable.

20.41 Sanitary Facilities

20.41.1 A minimum of one toilet, one wash basin and one tub or shower or both for every six seafarers or less who do not have en-suite sanitary facilities shall be provided at a convenient location.

20.41.2 Separate sanitary facilities shall be provided for men and for women. In respect of sanitary facilities for men and for women, vessels shall be provided with a minimum of 2 sets of sanitary facilities for the first two seafarers onboard plus an additional set of sanitary facilities for every additional 6 seafarers.

20.41.3 Where a sleeping room is provided with en-suite sanitary facilities those facilities shall include a minimum of one toilet, one wash basin and one tub or shower or both.

20.41.4 Where private or semi-private facilities cannot be provided, all seafarers shall have convenient access on the vessel to sanitary facilities meeting minimum standards of health and hygiene and reasonable standards of comfort. Hot and cold running fresh water shall be available in all wash places.

20.41.5 Sanitary facilities within easy access of the wheelhouse, and the machinery space or near the engine room control centre shall be provided where practical.

20.41.6 Every sleeping room shall be provided with a washbasin with hot and cold running fresh water, except where such a washbasin is situated in the en-suite sanitary facilities provided.

20.42 Hospital accommodation

20.42.1 Vessels carrying 15 or more seafarers and engaged in a voyage of more than three days' duration shall provide separate hospital accommodation to be used exclusively for medical purposes. This may be a treatment room that also meets the requirements for hospital accommodation. Hospital accommodation shall be designed to facilitate the giving of medical first aid and to help prevent the spread of infectious diseases.

20.42.2 It is recommended that the arrangement of the entrance, berths, lighting, ventilation, heating and water supply shall be designed to ensure comfort and facilitate the treatment of occupants.

20.42.3 Sanitary facilities shall be provided for the exclusive use of the occupants of the hospital accommodation, either as part of the accommodation or in close proximity thereto. Such sanitary facilities shall comprise a minimum of one toilet, one washbasin and one shower or tub.

20.42.4 Short-range yachts and other vessels that remain within 60 miles of the coast are exempt from 20.42.1. In cases where such vessels are engaged on voyages of more than three days duration, for example on re-positioning trips, an en-suite cabin shall be designated exclusively for medical purposes. Such a cabin shall be designed to facilitate (when in hospital mode) the giving of medical first aid and to help prevent the spread of infectious diseases and it is recommended that the arrangement of the entrance, berths, lighting, ventilation, heating and water supply shall be designed to ensure comfort and facilitate the treatment of occupants.

20.42.5 To help prevent the spread of infectious diseases and for patient comfort every hospital shall be fitted with mechanical exhaust ventilation independent from any ventilators provided for other parts of the seafarer accommodation.

20.42.6 For black and grey water requirements from hospitals MARPOL requirements shall be followed.

20.43 Laundry Facilities

20.43.1 Appropriately situated and furnished laundry facilities shall be available.

20.44 Offices

20.44.1 Separate offices or a common office for use by deck and engineer seafarers shall be provided where practicable.

20.45 Other Provisions

20.45.1 A space or spaces shall be provided on open deck for the recreation of seafarers to which seafarers can have access when off duty. This shall have a total floor area of 1.5 square metres per person for the greatest number of seafarers likely to use the space at any one time.

20.45.2 Vessels regularly trading to and within mosquito infested ports shall be fitted with appropriate devices to protect seafarers from mosquitos, as agreed by the BMA.

20.45.3 Appropriate seafarers' recreational facilities, amenities and services, as adapted to meet the special needs of seafarers who live and work onboard shall be provided.

20.46 Master's Inspections

20.46.1 There shall be weekly documented inspections carried out onboard vessels, by or under the authority of the Master, with respect to:

.1 supplies of food and drinking water;

.2 all spaces and equipment used for the storage and handling of food and drinking water;

.3 galley and other equipment used for the preparation and service of meals; and

.4 that seafarer accommodation is clean, decently habitable and maintained in a good state of repair.

20.46.2 The results of each inspection shall be recorded and made available for review.

20.47 Hand Holds and Grab Rails

20.47.1 There shall be sufficient hand holds and grab rails within the accommodation to allow safe movement around the accommodation at all times. Stairways shall be specially considered.

20.48 Securing of Heavy Equipment

20.48.1 All heavy items of equipment such as ballast, batteries, cooking stove, etc, shall be securely fastened in place. All stowage lockers containing heavy items shall have lids or doors which are capable of being securely fastened.

20.49 Sailing Vessels

20.49.1 The requirements of Part B apply to sailing vessels in the same way as they do to motor vessels.

20.49.2 Where the sailing vessel is below 1,500GT the variations described in 20.49.3 and 20.49.4 may be adopted.

20.49.3 On a case by case basis where due to the number of seafarers and passengers on a sailing vessel, it is not possible to meet the equivalent arrangements of 20.37.3.13 (minimum of 1 square metre free floor area per seafarers), seafarers shall have no worse accommodation arrangements than the passengers.

20.49.4 Where it is not possible to meet the requirements of 20.37.4.14 due to there not being a wheelhouse, an additional space that provides privacy for the seafarers who are officers, such as a spare cabin, may be provided to the satisfaction of the BMA. Such a space shall allow the seafarers who are officers to meet privately, or the seafarers who are officers to meet with other seafarers privately.

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 International Convention for the Prevention of Pollution from Ships (MARPOL)

21.2.1 *Annex I - Oil*

21.2.1.1 Yachts of 400 gross tonnage and above are required to be surveyed and to hold an International Oil Pollution Prevention (IOPP) Certificate in compliance with MARPOL Annex I and maintain on board an Oil Record Book Part I.

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 certified to carry more than 15 persons, **OR** of 400 gross tonnage and above, 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 **OR** of 400 gross tonnage and above, 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 Yachts shall comply with the provisions of MARPOL Annex VI unless expressly provided otherwise.

21.2.3.2 Yachts of 400 gross tonnage and above are required to be surveyed and to hold an International Air Pollution Prevention (IAPP) Certificate and an International Energy Efficiency Certificate (IEEC) in compliance with MARPOL Annex VI.

21.2.3.3 All diesel engines with an output of more than 130kW[40], 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 of 500 gross tonnage and above on or after 01 January 2021 shall comply with the Tier III NOx requirements specified in

[40] Approximately 177 horsepower

Regulation 13 of MARPOL Annex VI. However, compliance with Tier III requirements is only required for yachts that intend to enter a NOx Emission Control Area.

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 Yachts of less than 400 gross tonnage 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[41] (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 Yachts of 400 gross tonnage and above that use water for ballasting are required to be surveyed and hold an International Ballast Water Management Certificate.

[41] The International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004

22 PROTECTION OF PERSONNEL

22.2 Deckhouses and Superstructures

22.2.1 The structural strength of any deckhouse or superstructure shall comply with the requirements of a Recognised Organisation, as appropriate to the vessel and its areas of operation.

22.3 Bulwarks and Guard Rails

22.3.1 Bulwarks and/or guardrails on all accessible decks shall be 1000 mm high except that on vessels built to pre-1966 Load Line Convention standards these may be 915 millimetres high. Any opening shall not exceed 380 millimetres. Where no bulwarks are fitted, or bulwark height is less than 230 millimetres, the lowest opening shall not exceed 230 millimetres. They shall be supported at intervals not exceeding 2.2 metres. Intermediate courses of rails or wires shall be evenly spaced.

22.3.2 Satisfactory means (in the form of guard rails, life lines, gangways or under-deck passages, etc.) shall be provided for the protection of the crew in getting to and from their quarters, the machinery space and all other areas used in the necessary work of the craft.

22.3.3 Where the function of the vessel would be impeded by the provision of bulwarks and/or guard rails complying with section 22.3.1, alternative proposals detailed to provide equivalent safety for persons on deck shall be submitted to the BMA for approval, where recognised national or international standards may be accepted as equivalence.

22.3.4 The structural strength of any bulwarks or guardrails shall comply with the requirements of a Recognised Organisation, or a recognised international standard as appropriate to the vessel and its area of operation.

22.4 Noise

22.4.1 Unless the BMA deems that compliance with a particular provision is unreasonable or impractical, all new vessels of 1,600GT and above shall be constructed to reduce onboard noise and to protect personnel from noise in accordance with the IMO Code on Noise Levels onboard Ships, adopted by the IMO Maritime Safety Committee by resolution MSC.337(91), as may be amended by the IMO.

22.4.2 New vessels under 1,600GT shall meet the requirements of the Code on Noise Levels onboard Ships so far as is reasonable and practicable.

22.4.3 For all existing vessels, the IMO Code on Noise Levels onboard Ships promotes the control of noise within the framework of internationally agreed guidelines, whilst recommending methods of measuring noise at listening posts.

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

22.4.5 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.

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

22.4.7 The limits have been set from hearing damage risk considerations and the use of suitable ear protectors.

22.4.8 To indicate the need to wear ear protectors, safety signs, signs with symbols and supplementary warning notices shall be displayed at all entrances to spaces in which the noise level exceeds 85dB(A).

22.5 Safe Work Aloft, Over-side, and on the Bowsprit of Sailing Vessels

22.5.1 When access to the rig, bowsprit, or over-side working is required, provision shall be made to enable people to work safely, in accordance with recognised national or international standards.

22.5.2 The arrangements provided for accessing rigging shall be based on established safe working practices for the type of vessel. The arrangements may include but not be limited to:

.1 safety nets below the bowsprit;

.2 safety grab rails or jackstays (metal or wire) fixed along the bowsprit to act as handholds and strong points for safety harnesses;

.3 mandatory use of safety harnesses aloft, over-side, and for work on the bowsprit;

.4 sufficient footropes and horses in wire (or rope) permanently rigged to enable seafarers to stand on them whilst working out on the yards or on the bowsprit;

.5 safety jackstays (metal or wire) fixed along the top of the yards, to provide handholds and act as strong points for safety harnesses;

.6 means of safely climbing aloft, such as:

i. fixed metal steps or ladders attached to the mast; or

ii. traditional ratlines (rope) or, rattling bars (wood/steel), fixed across the shrouds to form a permanent ladder.

22.5.3 Safe means of external access to all parts of the vessel shall be made available where crew are expected to work through Over-side Working Systems in accordance with Section 36.

22.5.4 Equipment manufacturers of Over-side Working Systems and ship builder instructions and guidance on their installation, use, maintenance, inspection and testing shall be followed at all times.

22.5.5 The mast and other spaces requiring access via ladders shall include continuous fall protection measures to protect personnel when ascending or descending ladders.

22.5.6 New vessels shall have "External Access Plans" showing locations and loads for all elements of the Over-side Working Systems in accordance with Section 36 approved by a Recognised Organisation.

22.6 Personal Clothing

22.6.1 It shall be the responsibility of the Company/Master to advise that the following requirements for items of personal clothing shall be met:

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

.2 Each person onboard a vessel shall have footwear having non-slip soles, to be worn onboard.

22.7 Lifts (Elevators)

22.7.1 Personnel lift (elevator) installations shall be appropriately designed and constructed, installed and tested by a competent person.

22.7.2 Designs shall be submitted at an early stage of construction. Recognised international standards such as EN 81-1/EN81-2 shall be considered but the following gives a minimum standard that shall be provided:

.1 For vessels of 500 GT and above structural fire protection requires lift shaft within an "A" class division as per section 14.25. Where the lift shaft is fitted within a stairway enclosure there is no need for "A" class divisions between the lift and the staircase;

.2 Construction and installation for marine use shall be supported by a certificate from a Recognised Organisation or manufacturer and include a relevant load test;

.3 Lift shall comprise an enclosed capsule;

.4 A suitable means of escape from the capsule and lift shaft shall be provided;

.5 Mains and emergency power to be provided, where necessary to comply with item .4;
.6 Emergency lighting to be provided;
.7 An internal alarm and telephone to be provided;
.8 Normal operation shall ensure lift only stops at each deck; and
.9 "Not to be used in case of fire" sign shall be posted within.

22.7.3 Reference standards include:
.1 BS EN 81-20:2020 Safety rules for the construction and installation of lifts;
.2 ASME Elevator Code A.17.1
.3 BS 5655 series – Lifts and service lifts

22.8 Man-riding cranes

22.8.1 Design

22.8.1.1 In order for deck cranes or other lifting appliances, other than those covered by section 13, to be man-riding, they shall be certified as such through compliance with a recognised national or international standard to the satisfaction of the BMA.

22.8.2 Testing and Maintenance

22.8.2.1 Annual and 5 Yearly Testing and maintenance of man-riding cranes shall be in accordance with original manufacturer's instructions.

22.8.3 Operations

22.8.3.1 Operations of the man-riding cranes and other lifting appliances shall:
.1 be in accordance with the original equipment manufacturer's operating instructions
.2 be within any restrictions set by the original equipment manufacturer or Recognised Organisation approving the equipment
.3 Operating instructions shall be posted locally to any controls along with any restrictions

22.9 Additional Equivalence Considerations

22.9.1 None

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 Where more than 12 passengers are carried by the tenders, the IMO guidelines for passenger ship tenders MSC.1/Circ.1417 shall be followed.

23.1.6 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.

23.2 Pilot Boarding Arrangements:

23.2.1 Boarding arrangements provided for pilots shall have due regard for SOLAS V/23 and IMO Resolution A.1045(27) "Pilot transfer arrangements", International Maritime Pilots' Association (IMPA) recommendations, or any documents replacing them taking into consideration any national requirements.

23.3 Gangways, Passerelles, and Accommodation Ladders

23.3.1 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.

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

23.3.3 Equipment used to provide access shall also meet the standards or requirements set out in international standards[42] and applicable national legislation.

23.3.4 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.

23.3.5 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.

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

23.3.7 Reference standards include:

- IMO MSC.1/Circ.1331 – Guidelines for Construction, Installation, Maintenance and Inspection/Survey of Means of Embarkation and Disembarkation;
- ISO 7061:1993 - Shipbuilding - Aluminium shore gangways for seagoing vessels;
- ISO 5488:1979 - Shipbuilding - Accommodation ladders.

23.4 Submersible Craft

23.4.1 Submersible Craft carried on yachts shall comply with the standards of the BMA[43] 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;

[42] Refer to MSC.1/Circular.1331, Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation

[43] Refer to BMA Information Bulletin No.159

.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.

24 SAFETY MANAGEMENT (ISM CODE)

PART A – VESSELS OF LESS THAN 500GT

24.1 General Requirements

24.1.1 All vessels under 500GT 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 500GT, 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 400GT, 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[44] 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.

[44] Refer to BMA Information Bulletin No.4

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.

PART B - VESSELS OF 500GT AND ABOVE

24.17 General Requirements

24.17.1 Every vessel of 500GT and above to which this Code applies shall comply with the applicable requirements of SOLAS Chapter IX (IMO International Safety Management Code).

24.17.2 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.

25 SECURITY (ISPS CODE)

PART A – VESSELS OF LESS THAN 500GT

25.1 General Requirements

25.1.1 Vessels of less than 500 GT 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.

PART B – VESSELS OF 500GT AND ABOVE

25.2 General Requirements

25.2.1 Vessels of 500 gross tonnage and above shall comply with the ISPS Code

26 MANNING, CERTIFICATION, TRAINING AND HOURS OF REST

26.1 Passengers

26.1 "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, 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. For yachts with a keel laid after 20 August 2013 they shall be in accordance with MLC standards as laid out in Chapter 21, 21A & 21B for Part A yachts and Chapter 9 for Part B yachts or equivalent provisions provided for by the BMA;

.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 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 The Declaration of Maritime Labour Compliance (DMLC) Part II for the vessel shall include information on any roles onboard which shall be treated as occasional workers, how frequently such workers shall be onboard and for how long. It shall explain how the shipowner ensures that the above conditions are met for any occasional crew who are not seafarers. If the arrangements are persistently or frequently invoked for the same workers, the individuals shall be considered seafarers and full MLC requirements shall be applied.

26.2.4 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 The Bahamas Yacht Code or Bahamas Passenger Yacht Code, as applicable;

.3 applicable international conventions, including STCW and the MLC; and

.4 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 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 SOLAS requires that vessels of 500GT and above, excluding pleasure vessels not engaged in trade, carry a Minimum Safe Manning Document. Owners and operators of vessels below 500GT, or those of 500GT and above solely engaged for pleasure, may also 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 Vessels to which the Code applies shall be in possession of a Minimum Safe Manning Document which signifies that the BMA has approved the minimum manning levels for the yacht.

26.4.4.2 Application for a Minimum Safe Manning Document shall be made to the BMA, in accordance with BMA Information Bulletin No.115, 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[45]

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 the STCW provided that for private passenger yachts in accordance with the Bahamas Passenger Yacht Code, and Bahamas Yacht Code yachts under 3000 GT, appropriate Yacht qualifications may be accepted by the BMA.

26.4.5.2 Any person employed or engaged in any capacity onboard a seagoing ship 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[46] 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 seagoing ship to which this Code applies, on the business of that ship as part of the ship's 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[47] and be in possession of appropriate documentation attesting to the satisfactory completion of such training and instruction.

[45] 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

[46] See Section A-VI/1 of Part A of the Code to the STCW paragraph 1

[47] 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 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 Carriage of Doctors or Medically Trained Personnel

27.2.1 Ships carrying 100 or more persons and undertaking international voyages in excess of 600 miles shall carry a qualified medical doctor who is responsible for providing medical care.

27.2.2 In yachts not required to carry a doctor 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.

27.3 Medical Advice

27.3.1 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.

27.3.2 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.

27.4 Provision of On-board Medical Care

27.4.1 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.

27.5 Medical Cabinet

27.5.1 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.

27.5.2 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.

27.5.3 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.

27.6 Carriage of Medical Stores

27.6.1 The ship shall carry onboard medical stores and equipment as specified by the BMA in Marine Notice 41.

27.6.2 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).

27.6.3 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.

27.7 Carriage of Medical Guides

27.7.1 The ship shall carry guides as to the use of medical stores specified in 27.6 including, in particular, instructions for the use of antidotes.

28 OPERATIONAL READINESS, MAINTENANCE AND 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[48] 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;

[48] Refer to the Guidelines for periodic servicing and maintenance of lifeboats, launching appliances and onload release gear MSC.402(96)

.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 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[49].

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.

[49] 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).

.3 service at intervals not exceeding five years shall be carried out in accordance with the recommendations of the IMO[50].

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[51]; 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

[50] 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

[51] Refer to MSC/Circ.955, Servicing of life-saving appliances and Radiocommunication equipment under the harmonized system of survey and certification (HSSC).

whenever the release gear is overhauled provided that such overhauling and tests shall be carried out at least once every five years[52].

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[53] 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[54], 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:

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[52] 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)

[53] Results of MES rotational deployments shall be reported to the Administration as per BMA Information Bulletin No.174 - Marine Evacuation Systems

[54] 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).

.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.

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[55] 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;

[55] Refer to the revised guidelines for the on maintenance and inspection of fire protection systems and appliances (MSC.1/ Circ.1432).

.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.

29 EMERGENCY TRAINING AND 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[56].

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;

[56] Please refer to ILO Accident Prevention on Board Ship section 10.11.3

.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.

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[57].

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:

.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

[57] See IMO Resolution A.1050(27) – Revised Recommendations for Entering Enclosed Spaces Aboard Ships

.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[58].

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.

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;

[58] See IMO Resolution A.1050(27) – Revised Recommendations for Entering Enclosed Spaces Aboard Ships

.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 29.1.3.1 to 29.1.3.3 & 29.1.6.1.

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 29.1.2.9 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[59] 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[60].

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.

[59] 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.
[60] 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 Survey and Certification

30.1.1 All ships covered by this Code are required to be surveyed and certified in accordance with the applicable requirements of the survey guidelines under the IMO Harmonized System of Survey and Certification adopted by resolution A.1140(31) as applicable to cargo ships.

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 Load Line Certificate 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 certification and services may be undertaken by:

.1 surveyors of the BMA; or

.2 surveyors of a Recognised Organisation appointed by the BMA; or

.3 surveyors of a Yacht Survey Organisation appointed by the BMA (yachts of less than 500GT only).

30.1.4 All requests for survey and certification shall be made to the BMA or the appropriate Recognised Organisation or Yacht Survey Organisation where such surveys are delegated.

30.2 Use of a Recognised Organisation

30.2.1 Authorised Recognised 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 governs the relationship between the two parties.

30.3 Use of a Yacht Survey Organisation

30.3.1 Yacht Survey Organisations are only authorised to undertake statutory certification and services on yachts of less than 500 gross tonnage.

30.3.2 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 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[61].

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[62] after it occurs and to provide details so that an 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[63]. 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.

[61] Please refer to BMA Information Bulletin No.4
[62] Within 4 hours of occurrence
[63] 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 are issued by the BMA. Other certificates are issued by the BMA or a Recognised Organisation acting on its behalf.

31.2 Certificates to be issued to all vessels

.1 Certificate of Registry
.2 International Tonnage Certificate
.3 Bahamas Large Charter Yacht Certificate of Compliance
.4 Certificate of Classification
.5 International Load Line Certificate
.6 Load Line Conditions of Assignment
.7 International Sewage Pollution Prevention Certificate (when more than 15 persons are carried onboard)
.8 Minimum Safe Manning Document
.9 Antifouling Systems, Owners Declaration (<400GT)
.10 EIAPP Certificates / NOx Technical Files (for each engine with a power output of more than 130kW built after 01 January 2000)
.11 Ship Radiocommunications Licence[64]
.12 International Ballast Water Management Certificate/Statement (if applicable)

31.3 Additional certificates to be issued to vessels of 300 GT and above

.1 Safety Radio Certificate and Form R (BYC vessels only)
.2 Wreck Removal Insurance Certificate

31.4 Additional certificates to be issued to vessels of 400 GT and above

.1 International Oil Pollution Prevention Certificate and Record
.2 International Sewage Pollution Prevention Certificate
.3 International Air Pollution Prevention Certificate and Record
.4 International Energy Efficiency Certificate
.5 Antifouling Systems Certificate

[64] Issued by BMA on behalf of The Bahamas Utilities Regulation and Competition Authority (URCA)

31.5 Additional certificates to be issued to vessels of 500 GT and above

.1 Safety Construction Certificate
.2 Safety Equipment Certificate
.3 ISM Safety Management Certificate
.4 International Ship Security Certificate
.5 Continuous Synopsis Record file
.6 Maritime Labour Convention (MLC) Certificate (including DMLC Part I and DMLC Part II)

31.6 Additional certificates to be issued to vessels of 1,000 GT and above

.1 Civil Liability Certificate for Bunker Oil Pollution Damage (Bunkers Convention)

32 SPECIAL INSTRUCTIONS FOR SPECIFIC YACHT TYPES

32.1 General

32.1.1 There are currently no special instructions.

33 HELICOPTER LANDING AREAS

33.1 General

33.1.1 Introduction

33.1.1.1 This section outlines the minimum standards for Helicopter Landing Areas (HLA), and associated facilities onboard vessels within the scope of this Code where helicopter operations to or from the vessel are required. It also addresses operational considerations as related to the yacht crew.

33.1.1.2 The appointed Aviation Inspection Body is responsible for the issuing of the following certificates:

.1 A "Helicopter Landing Area Technical Certificate" may be issued where only the physical design characteristics of this section have been met, but may include operational limitations such as night use or maximum wind speeds etc; and

.2 A "Helicopter Landing Area Certificate" shall be issued when all of the requirements of this section have been met and will also note any operational deck limitations.

33.1.1.3 Requirements with respect to the HLA on a vessel results from the need to ensure that helicopters are always afforded sufficient space to be able to operate safely in the varying conditions experienced.

33.1.1.4 In order to ensure safe operation it is envisaged that limitations regarding the availability of the landing area shall be applied by the Aviation Inspection Body on behalf of the BMA.

33.1.1.5 The helicopter's performance requirements and handling techniques are contained in, and governed by, the Rotorcraft Flight Manual and/or the operator's Operations Manual.

33.1.2 Risk Assessment

33.1.2.1 In all cases, a formal and documented risk assessment of the operation shall be carried out by a suitably experienced and qualified individual authorised by the BMA. The risk assessment shall establish the hazards and resultant risks associated with the operation of each helicopter type that it is planned to utilise the HLA of the yacht concerned. This shall include the physical requirements for the characteristics of the landing area.

33.1.3 Further guidance

33.1.3.1 This section does not address helicopter flight operations in any detail. It is intended as a technical standard for the landing area and associated on-board

helicopter facilities. The helicopter pilot/operator is responsible for ensuring that the requirements of the Administration with which the helicopter is registered and the requirements of the Administration responsible for the airspace in which the helicopter is operating are complied with in full. The Aviation Inspection Body may provide further guidance.

33.1.3.2 The ICS[65] 'Guide to Helicopter/Ship Operations' (as amended) shall be considered during the development of Helicopter Landing Areas and their safe operations.

33.1.3.3 Enquiries regarding operational (flight) limitations based on non-compliances of the landing area shall be directed to the Aviation Inspection Body.

33.2 Design and Construction

33.2.1 Introduction

33.2.1.1 This section provides information on physical requirements for the characteristics of helicopter landing areas on a yacht within the scope of the Code.

33.2.1.2 The risk assessment carried out in 33.1.2.1 in order to establish the adequacy of the landing area shall include, for each helicopter landing area, the proposed maximum size of helicopter in terms of D-value and the proposed maximum take-off weight of the heaviest helicopter in terms of "t" value for which it is proposed each landing area is certificated with regard to size and strength.

33.2.1.3 The criteria which follow in Table H.1 are based on helicopter size and weight and are for guidance only. The latest information shall be sought from the helicopter manufacturer.

33.2.1.4 In addition to the risk assessment, the following plans and particulars shall be submitted to the Aviation Inspection Body, Certifying Authority, Recognised Organisation and BMA (as appropriate) for approval-

.1 Hangar general arrangement (showing dimensions and structural considerations).
.2 Helicopter lift and movement arrangements (if appropriate).
.3 Structural fire protection.
.4 Fire detection and extinguishing arrangements

[65] International Chamber of Shipping – www.ics-shipping.org

TYPE	D VALUE (m)	PERIMETER 'D' MARKING	ROTOR DIAMETER (m)	MAXIMUM WEIGHT (kg)	'T' VALUE
MD 500E	9.4	9	8.05	1361	1.4
Robinson R44	11.66	12	5.03	1134	1.2
Airbus Ind. H120	11.52	12	10.00	1715	1.7
MD 600N	11.79	12	8.38	1860	1.9
Bell 206 B3	12.11	12	10.16	1519	1.5
Bolkow Bo 105D	12.00	12	9.90	2400	2.4
MD 902	12.37	12	10.34	3250	3.3
Bell 206 L4	12.91	13	11.28	2018	2.0
Bell 407	12.61	13	10.66	2268	2.3
Airbus Ind. H130	12.64	13	10.69	2400	2.4
Airbus Ind. H125 B3	12.94	13	10.69	2250	2.3
Airbus Ind. AS355	12.94	13	10.69	2800	2.8
Airbus Ind. H135	12.10	12	10.20	2720	2.7
Agusta A119	13.02	13	10.83	2720	2.7
Bell 427	13.00	13	11.28	2971	3.0
Bell 429	13.11	13	10.98	3175	3.2
Bolkow 117	13.00	13	11.00	3200	3.2
Airbus Ind. H145	13.03	13	11.00	3585	3.6
Agusta A109	13.05	13	11.00	2600	2.6
Agusta Grand	12.96	13	10.83	3175	3.2
Airbus Ind. AS365 N3	13.73	14	11.94	4300	4.3
H155 B1	14.30	14	12.60	4920	4.9
AW 169	14.65	15	12.12	4500	4.5
Bell 430	15.29	15	12.80	4218	4.2
Sikorsky S76	16.00	16	13.40	5318	5.3
Agusta/Bell 139	16.66	17	13.80	6400	6.4
Bell 212	17.46	17	14.63	5080	5.1
Bell 412	17.13	17	14.02	5398	5.4
AW 189	17.60	18	14.60	8300	8.3
Airbus Ind. H175	18.06	18	14.80	7500	7.5
Super Puma AS332 L	18.70	19	15.00	8599	8.6
Bell 214ST	18.95	19	15.85	7938	8.0
Super Puma AS332 L2	19.50	20	16.20	9300	9.3
H 225	19.50	20	16.20	11000	11.0
Bell 525	19.75	20	15.70	9299	9.3

Table H.1 - Value and Helicopter Type Criteria (Not Exhaustive)

33.2.2 *Purpose*

33.2.2.1 This section provides additional measures in order to address the fire safety objectives for ships fitted with special facilities for helicopters and for this purpose the following functional requirements shall be met:

.1 helideck structure shall be adequate to protect the ship from the fire hazards associated with helicopter operations;

.2 fire-fighting appliances shall be provided to adequately protect the ship from the fire hazards associated with helicopter operations;

.3 refuelling and hangar facilities and operations shall provide the necessary measures to protect the ship from the fire hazards associated with helicopter operations; and

.4 operation manuals and training shall be provided.

33.2.3 *General Requirements*

33.2.3.1 Helicopter landing areas shall meet the requirements of ICAO Annex 14 to the Convention on International Civil Aviation.

33.2.3.2 The standards of ICAO Annex 14 shall be followed where applicable for:

.1 "Purpose-built Shipboard Heliports"; and

.2 "Purpose-built Shipboard Heliports provided in the bow or stern of the ship"

33.2.3.3 The structural strength of the helicopter landing area shall be designed and constructed according to rules of a Recognised Organisation on helicopter landing areas for vessels.

33.2.4 *Construction of steel or other equivalent material*

33.2.4.1 In general, the construction of the helidecks shall be of steel or other equivalent materials. The underside of the helideck in way of all enclosed spaces shall be insulated to A-60 class.

33.2.5 *Construction of aluminium or other low melting point metals*

33.2.5.1 Where the BMA has permitted aluminium or other low melting point metal construction that is not made equivalent to steel, the following provisions shall be satisfied:

.1 The underside of the helideck in way of all enclosed spaces shall be insulated to A-60 class.

.2 after any fire on the ship or on the platform, the platform shall undergo a structural analysis to determine its suitability for further use; and

.3 consideration shall be given to the protection of any glazed openings in exposed locations immediately forward of and/or below the helideck. Such glazed openings do not include those that are considered to be

adequately protected by an overhanging superstructure deck or are located within recesses in the hull side.

33.2.6 *Fire Fighting Appliances*

33.2.6.1 The following fire fighting appliances shall be provided in close proximity to the helideck and stored near the means of access to that helideck-

.1 at least two dry powder extinguishers having a total capacity of not less than 45 kilograms;

.2 carbon dioxide extinguishers of a total capacity of not less than 18 kg or equivalent;

.3 a suitable foam application system consisting of monitors or foam making branch pipes or pop up nozzles in a Deck Integrated Fire Fighting System (DIFFS), capable of delivering foam to all parts of the helideck in all weather conditions in which helicopters can operate and which shall be capable of delivering a discharge rate as required in Table D.2 for at least five minutes;

.4 the principal agent shall be suitable for use with salt water and conform to performance standards not inferior to those acceptable to the IMO[66];

.5 at least two nozzles of an approved dual-purpose type (jet/spray) and hoses sufficient to reach any part of the helideck;

.6 in lieu of the requirements of paragraphs .3 to .5 on ships constructed on or after 01 January 2021 having a helideck, foam firefighting appliances which comply with the provisions of the Fire Safety Systems Code Chapter 17;

.7 in addition to the requirements of the relevant Part of the Code, two sets of fire-fighter's outfits; and

.8 at least the following equipment shall be stored in a manner that provides for immediate use and protection from the elements-

i. adjustable wrench
ii. blanket, fire resistant;
iii. cutters, bolt, 60 cm;
iv. hook, grab or salving;
v. hacksaw, heavy duty, complete with 6 spare blades;
vi. ladder;
vii. lift line 5 millimetres diameter × 15 m in length;
viii. pliers, side-cutting;
ix. set of assorted screwdrivers; and
x. harness knife, complete with sheath.

[66] Refer to the International Civil Aviation Organization Airport Services Manual, part 1, Rescue and Fire Fighting, chapter 8, Extinguishing Agent Characteristics, Paragraph 8.1.5, Foam Specifications table 8-1, Level "B".

Category	Helicopter overall length	Discharge rate foam solution (litres/minute)
H1	up to but not including 15 metres	250
H2	from 15 metres up to but not including 24 metres	500
H3	from 24 metres up to but not including 35 metres	800

Table H.2 Foam discharge rates

33.2.7 *Drainage Facilities*

33.2.7.1 Drainage facilities in way of helidecks shall be constructed of steel and shall lead directly overboard independent of any other system and shall be designed so that drainage does not fall onto any part of the ship.

33.2.8 *Access Points and Means of Escape*

33.2.8.1 Many helicopters have passenger access on one side only and helicopter landing orientation in relation to landing area access points becomes important because it is necessary to ensure that embarking and disembarking passengers are not required to pass around the helicopter tail rotor, or under the front of the main rotor of those helicopters with a low profile rotor, should a 'rotors-running turn-round' be conducted.

33.2.8.2 There shall be a minimum of two access/egress routes to the helicopter landing area and these shall be as widely separated as possible. The arrangements shall be optimised to ensure that, in the event of an accident or incident on the helicopter landing area, personnel shall be able to escape upwind of the landing area. Adequacy of the emergency escape arrangements from the helicopter landing area shall be included in any evacuation, escape and rescue analysis for the vessel, and may require a third escape route to be provided.

33.2.8.3 Where foam monitors are co-located with access points, care shall be taken to ensure that no monitor is so close to an access point as to cause injury to escaping personnel by operation of the monitor in an emergency situation.

33.2.8.4 Where handrails associated with landing area access/escape points exceed the height limitations given by ICAO Annex 14, they shall be retractable, collapsible or removable. When retracted, collapsed or removed the rails shall not impede access/egress. Procedures shall be in place to retract, collapse, or remove them prior to helicopter arrival. Once the helicopter has landed, and the crew has indicated that passenger movement may commence, the handrails may be

raised and locked in position. The handrails shall be retracted, collapsed, or removed again prior to the helicopter taking-off.

33.2.8.5 A helideck shall be provided with both a main and an emergency means of escape and access for firefighting and rescue personnel. These shall be located as far apart from each other as is practicable and preferably on opposite sides of the helideck.

33.2.9 Environmental Effects

33.2.9.1 The safety of helicopter flight operations can be seriously degraded by environmental effects that may be present around vessels. The term "environmental effects" describes the effects of the vessel, its systems, and forces in the surrounding environment, which result in a degraded local environment in which the helicopter is expected to operate. These environmental effects are typified by structure-induced turbulence, and turbulence/thermal effects caused by exhaust emissions. Controls in the form of landing area availability restrictions may be necessary and shall be imposed via the Aviation Inspection Body. Such restrictions can be minimised by careful attention to the design and layout of the vessel topsides and, in particular, the location of the helicopter landing area.

33.2.9.2 All new helicopter landing areas, or modifications to existing topside arrangements which could potentially have an effect on the environmental conditions due to turbulence around an existing helicopter landing area, or helicopter landing areas where operational experience has highlighted potential airflow problems shall be subject to appropriate wind tunnel testing or Computational Fluid Dynamics (CFD) studies to establish the wind environment in which helicopters shall be expected to operate. Operations to a vessel underway where the helideck shall be subjected to relative rather than true wind velocity shall be taken into consideration. As a guide the standard deviation of the vertical airflow velocity shall be limited to 1.75m/s. This airflow velocity shall be applied to the recommended approach/departure path and landing/take off phase of the aircraft. The helicopter pilot/operator and Aviation Inspection Body shall be informed at the earliest opportunity of any wind conditions for which this criterion is not met in order to allow the appropriate platform availability restrictions/limitations shall be defined if necessary.

33.2.9.3 Designers of helicopter landing areas shall commission a survey of ambient temperature rise based on a Gaussian dispersion model and supported by wind tunnel tests or CFD studies for new build helicopter landing areas, modifications to existing topside arrangements, or for helicopter landing areas where operational experience has highlighted potential thermal problems. When the results of such modelling and/or testing indicate that there may be a rise of air

temperature of more than 2°C (averaged over a 3 second time interval), the helicopter pilot/operator and Aviation Inspection Body shall be consulted at the earliest opportunity so that appropriate platform availability restrictions/limitations may be applied if necessary.

33.3 Operations

33.3.1 HLA Operations Manual

33.3.1.1 Each helicopter facility (including any refuelling and hangar facilities) shall have an Operations Manual, including a description and a checklist of safety precautions, procedures and equipment requirements. This manual may be part of the ship's emergency response procedures.

33.3.1.2 The maximum helicopter weight and 'D' value for which the helicopter landing area has been designed and the maximum size and weight of helicopter for which the vessel is certificated shall be included in the Helicopter Landing Area Operations Manual, Helicopter Landing Area Technical Certificate (where issued) and Helicopter Landing Area Certificate. The extent of the obstacle-free area shall also be stated and reference made to any helicopter landing area operating limitation imposed by helicopter operators or the Aviation Inspection Body as a result of non-compliances. Details of non-compliances themselves shall also be listed.

33.3.1.3 The procedures and precautions shall be followed during refuelling operations shall be in accordance with recognized safe practices and contained in the operations manual.

33.3.1.4 Firefighting personnel, consisting of at least two persons trained for rescue and firefighting duties, and firefighting equipment shall be immediately available at all times when helicopter operations are expected.

33.3.1.5 On-board refresher training shall be carried out and additional supplies of firefighting media shall be provided for training and testing of the equipment.

33.3.2 Movement of HLA due to Wave Motions at Ship

33.3.2.1 Yachts experience dynamic motions due to wave action which represent a potential hazard to helicopter operations. For helicopter operations, acceleration in pitch, roll and heave shall provide the limiting factor. These limits are a combination of both vessel and helicopter capability. Operational limitations based on limited pitch, roll and heave may therefore be applied to the landing area by the Aviation Inspection Body. Helicopter landing area downtime due to excessive deck motion can be minimised by careful consideration of the location of the landing area on the vessel at the design stage. Guidance on helicopter landing area location and how to assess the impact of the resulting motion on

operability is presented in UK CAA Paper 2004/02 "Helideck Landing Area Design Considerations – Environmental Effects", as may be amended from time to time and which is available on the Publications section of the UK CAA website at www.caa.co.uk. Designers of helicopter landing areas shall consult this paper at the earliest possible stage of the design process.

33.3.2.2 The helicopter landing area shall be limited to receiving helicopters in the conditions agreed by the Aviation Inspection Body.

33.3.2.3 Details of pitch, roll, and heave motions shall be recorded on the vessel prior to, and during, all helicopter movements. Pitch and roll reports to helicopters shall include values, in degrees, about both axes of the true vertical datum (i.e. relative to the true horizon) and be expressed in relation to the vessel's head. Roll shall be expressed in terms of 'port' and 'starboard'; pitch shall be expressed in terms of 'up' and 'down'; heave shall be reported in a single figure, being the total heave motion of the helicopter landing area rounded up to the nearest metre. Heave shall be taken as the vertical difference between the highest and lowest points of any single cycle of the helicopter landing area movement. The parameters reported shall be the maximum peak levels recorded during the 10-minute period prior to commencement of helicopter operations.

33.3.2.4 The helicopter pilot is concerned, in order to make vital safety decisions, with the amount of 'slope' on, and the rate of movement of, the helicopter landing area surface. It is therefore important that the roll values are only related to the true vertical and do not relate to any 'false' datum (i.e. a 'list') created, for example, by anchor patterns or displacement. There are circumstances in which a pilot can be aided by amplification of the heave measurement by reference to the time period (seconds) in terms of 'peak to peak'.

33.3.3 *Aircraft Operational Data – Reporting and Recording*

33.3.3.1 It is essential that yachts are provided with means of ascertaining and reporting at any time-

.1 The movement of the vessel to deduce 'Roll', 'Pitch', and 'Heave'.
.2 the wind speed and direction using aviation approved equipment to ICAO standard;
.3 the air temperature;
.4 the barometric pressure using aviation approved equipment to ICAO standard;
.5 the visibility, cloud base and cover; and
.6 the sea state.

33.3.3.2 Air temperature and barometric pressure shall be measured by conventional instruments approved to ICAO standards. An indication of wind speed and direction shall be provided visually to the pilot by the provision of a windsock coloured so as to give maximum contrast with the background. However, for recording purposes, an anemometer positioned in an unrestricted airflow is required. A second anemometer located at a suitable height and position can give useful information on wind velocity at hover height over the helicopter landing area in the event of turbulent or deflected airflows over the deck. Visibility, cloud conditions, and sea state shall normally be assessed by visual observations.

33.3.3.3 Measuring instruments used to provide the data listed in 33.3.3.1 and 33.3.3.2 above shall be periodically calibrated in accordance with the manufacturer's recommendations in order to provide continuing accuracy.

33.3.4 *Support Equipment*

33.3.4.1 Provision shall be made for equipment needed for use in connection with helicopter operations including-

.1 chocks and tie-down strops;

.2 a suitable power source for starting helicopters if helicopter shut down is seen as an operational requirement; and

.3 equipment for clearing the helicopter landing area of snow and ice and other contaminants.

33.3.4.2 Chocks shall be compatible with helicopter undercarriage/wheel configurations. Helicopter operating experience has shown that the most effective chock for use on helicopter landing areas is the 'NATO sandbag' type. Alternatively, 'rubber triangular' or 'single piece fore and aft' type chocks may be used as long as they are suited to all helicopters likely to operate to the helicopter landing area. The 'rubber triangular' chock is generally only effective on decks without nets.

33.3.4.3 For securing helicopters to the helicopter landing area only adjustable tie-down strops shall be used.

33.3.5 *Radio Communications Equipment*

33.3.5.1 At least one aeronautical frequency radio licensed by the Administration responsible for the airspace in which the helicopter is intended to operate when approaching the vessel shall be fitted onboard the vessel.

33.3.5.2 Radio operators of offshore aeronautical radio stations are required to hold a Certificate of Competence. Further information can be found in CAA Publication CAP 452 'Aeronautical Radio Station Operator's Guide'.

33.3.6 *Risk Assessment*

33.3.6.1 A full risk assessment shall be carried out addressing all the operations anticipated with helicopter operations onboard a yacht. This shall include-

.1 Landing and securing
.2 Preparing for take-off and taking off
.3 Unloading passengers, baggage and stores
.4 Refuelling
.5 Securing
.6 Safe movement of personnel

33.3.6.2 The risk assessment shall be submitted to the BMA. The risk assessment to address the safe movement of personnel on the helicopter landing area shall also be submitted for approval by the Aviation Inspection Body to demonstrate that safe passenger movement may take place without endangering the safety of the helicopter or the life of personnel on-board.

33.3.7 *Crew Training*

33.3.7.1 All crew onboard shall undergo familiarisation training regarding helicopter operations onboard.

33.3.7.2 Specific training shall be provided to the Helicopter Landing Officer (HLO) by an appropriate training provider. Training of crewmembers and the HLO shall include both practical and theoretical sessions and, wherever possible, practical training shall be carried out onboard.

33.3.7.3 All other crew assigned duties within the helicopter landing area operations team(s) shall be certificated as Helideck Landing Assistants (HLA) by an appropriate training provider. The training shall include dealing with fires and other possible emergency scenarios.

33.3.7.4 Where there are refuelling facilities onboard, at least one member of crew shall be trained in the handling of aviation fuel and associated quality control procedures.

33.3.7.5 The crew shall practice dealing with the possible emergency scenarios through regular drills onboard with an annual inspection by an external auditor.

33.3.7.6 The emergency scenarios shall be addressed in the yacht's contingency plans and similar documents.

33.4 Helicopter Hangar Facilities

33.4.1 General Requirements

33.4.1.1 Hangar and maintenance facilities shall be treated as category 'A' machinery spaces with regard to structural fire protection, fixed fire-extinguishing and detection system requirements.

33.4.1.2 Enclosed hangar facilities shall be provided with mechanical ventilation, as required by section 14 and ventilation fans shall be of non-sparking type.

33.4.1.3 Electric equipment and wiring in enclosed hangar or enclosed spaces containing refuelling installations shall also comply with the requirements of section 14;

.1 when developing hangar arrangements, consideration shall be given to the type of fuel on which the helicopter to be stowed is run.

.2 the following plans and particulars shall be submitted to the Recognised Organisation and BMA for approval-

i. hangar general arrangement and structure;

ii. helicopter lift, hoist, and movement arrangements (if appropriate);

iii. structural fire protection;

iv. fire detection and extinguishing arrangements; and

v. ventilation arrangements.

33.4.1.4 Helicopter hangar(s) onboard shall be positioned, as far as is practicable, so as to preclude excessive movement and acceleration forces. Guidance on this shall be sought from the helicopter manufacturer/operator. Where possible, the positioning of hangar(s) shall be determined through the use of computer modelling and/or wind tunnel testing (refer also to Section 33.2.9.3);

33.4.1.5 If the hanger is to be accessed whilst the helicopter is stowed within it, means of escape and clearance around the helicopter for crew shall be considered, as well as any minimum clearances required for maintenance to be conducted whilst stowed.

33.4.1.6 Where appropriate CCTV shall be used to ensure visibility of the aircraft at all times.

33.5 Helicopter Re-Fuelling Facilities

33.5.1 Introduction

33.5.1.1 This section outlines the considerations for the storage and transfer of aviation fuel. When developing fuelling arrangements, consideration shall be given to the type of fuel on which the helicopter to be operated is run. In addition, all facilities for the storage and handling of aviation fuels onboard shall be grade

identified using an appropriate industry marking for the grade of fuel used. Aviation fuel facilities shall also be fully segregated from any other fuel system.

33.5.1.2 Refuelling and defuelling systems onboard are highly specialist areas and as such, expertise shall be sought in the design of such systems which shall be to an appropriate industry standard to the satisfaction of the Aviation Inspection Body.

33.5.1.3 Refuelling and defuelling operational considerations shall be agreed with the helicopter pilot/operator and Aviation Inspection Body.

33.5.1.4 The following plans and particulars shall be submitted to the Aviation Inspection Body and Recognised Organisation for approval-

.1 description of fuel with statement of minimum flash point (closed cup test);
.2 arrangements of fuel storage and piping;
.3 arrangements for drainage, ventilation and sounding of spaces adjacent to storage tanks;
.4 details and approval certification of pumping units;
.5 structural fire protection arrangements of all spaces to contain aviation fuel;
.6 fire detection and extinguishing arrangements; and
.7 ventilation arrangements.

33.5.1.5 When developing operational procedures for the movement of aviation fuel onboard, the restricted use of radio frequency equipment including portable phones, with regard to transmission sparks, shall be considered.

33.5.2 *General Requirements*

33.5.2.1 Where the ship has helicopter refuelling facilities, the following requirements shall be complied with:

.1 a designated area shall be provided for the storage of fuel tanks which shall be-
  i. as remote as is practicable from accommodation spaces, escape routes and embarkation stations; and
  ii. isolated from areas containing a source of vapour ignition.
.2 the fuel storage area shall be provided with arrangements whereby fuel spillage may be collected and drained to a safe location;
.3 tanks and associated equipment shall be protected against physical damage and from a fire in an adjacent space or area;
.4 where portable fuel storage tanks are used, special attention shall be given to-
  i. design of the tank for its intended purpose;

ii. mounting and securing arrangements;
iii. electric bonding; and
iv. inspection procedures;

.5 storage tank fuel pumps shall be provided with means which permit shutdown from a safe remote location in the event of a fire and where a gravity fuelling system is installed, equivalent closing arrangements shall be provided to isolate the fuel source;

.6 the fuel pumping unit shall be connected to one tank at a time and the piping between the tank and the pumping unit shall be of steel or equivalent material, as short as possible, and protected against damage;

.7 electrical fuel pumping units and associated control equipment shall be of a type suitable for the location and potential hazards;

.8 fuel pumping units shall incorporate a device which shall prevent over-pressurisation of the delivery or filling hose;

.9 equipment used in refuelling operations shall be electrically bonded;

.10 "NO SMOKING" signs shall be displayed at appropriate locations;

.11 refuelling facilities shall be treated as category 'A' machinery spaces with regard to structural fire protection, fixed fire-extinguishing and detection system requirements;

.12 enclosed spaces containing refuelling installations shall be provided with mechanical ventilation, as required by section 14 and ventilation fans shall be of non-sparking type; and

.13 electric equipment and wiring in enclosed spaces containing refuelling installations shall also comply with requirements of section 14.

33.5.3 *Storage of Aviation Fuel*

33.5.3.1 The storage and handling area shall be permanently marked. Instructions for filling fuel and, if appropriate, emptying fuel, shall be posted in the vicinity of the filling area.

33.5.4 *Fuel Pumping and Storage Tank Filling*

33.5.4.1 In general, all piping systems shall be located clear of accommodation spaces, escape routes, embarkation stations and ventilation openings and shall not pass through category A machinery spaces. However, where arrangements are such that piping has to pass through accommodation spaces, service spaces, escape routes, or embarkation stations double skinned piping shall be used, or pipes shall be enclosed in a cofferdam.

33.5.4.2 Means shall be provided for keeping deck spills away from accommodation and service areas.

33.5.5 *Refuelling and Defuelling Helicopters*

33.5.5.1 Where appropriate CCTV shall be used to ensure full view from the bridge of all helicopter refuelling activities that would normally be hidden from view.

33.5.6 *Prevention of Fuel Contamination*

33.5.6.1 The location and arrangement of air pipes for fuel tanks shall be such that in the event of a broken vent pipe, this does not directly lead to ingress of seawater or rainwater.

33.5.6.2 At least one member of crew on-board the vessel shall be trained in the handling of aviation fuel and associated quality control procedures. This person(s) shall oversee all operations involving the movement of aviation fuel on-board. Further guidance on such training may be obtained from the fuel supplier and marine aviation consultants.

33.5.7 *Fuel Pumping Spaces and Compartments*

33.5.7.1 Where it is intended to install fuel transfer pumps for handling aviation fuel in a separate compartment, the pump room(s); shall be totally enclosed and have no direct communication through, e.g. bilge piping systems and ventilation systems, with machinery spaces; shall be situated adjacent to the fuel storage tanks; and shall be provided with ready means of access from the weather deck.

33.6 Other references

33.6.1 Guidance for landing area design considerations are given in UK Civil Aviation Authority Paper 2004/02 (as may be amended from time to time) which shall be consulted by designers of helicopter landing areas at the earliest possible stage of the design process and is available through the CAA website (www.caa.co.uk).

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 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 SYSTEMS

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:

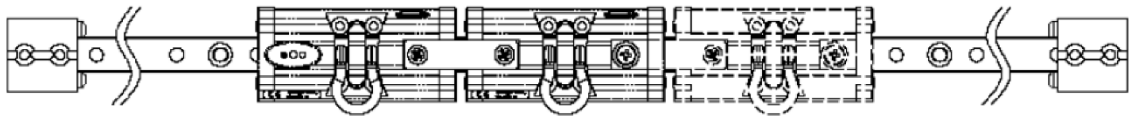
.1 "Rail and car" or "rail and trolley" systems comprising of two travellers, cars or trolleys linked in tandem that can be separated, if necessary, into independent units. These cars are fitted to a metal rail which allows them to glide along it and to which support harnesses are attached.

.2 Harnesses, lanyards, fall arresters, energy absorber and similar devices.

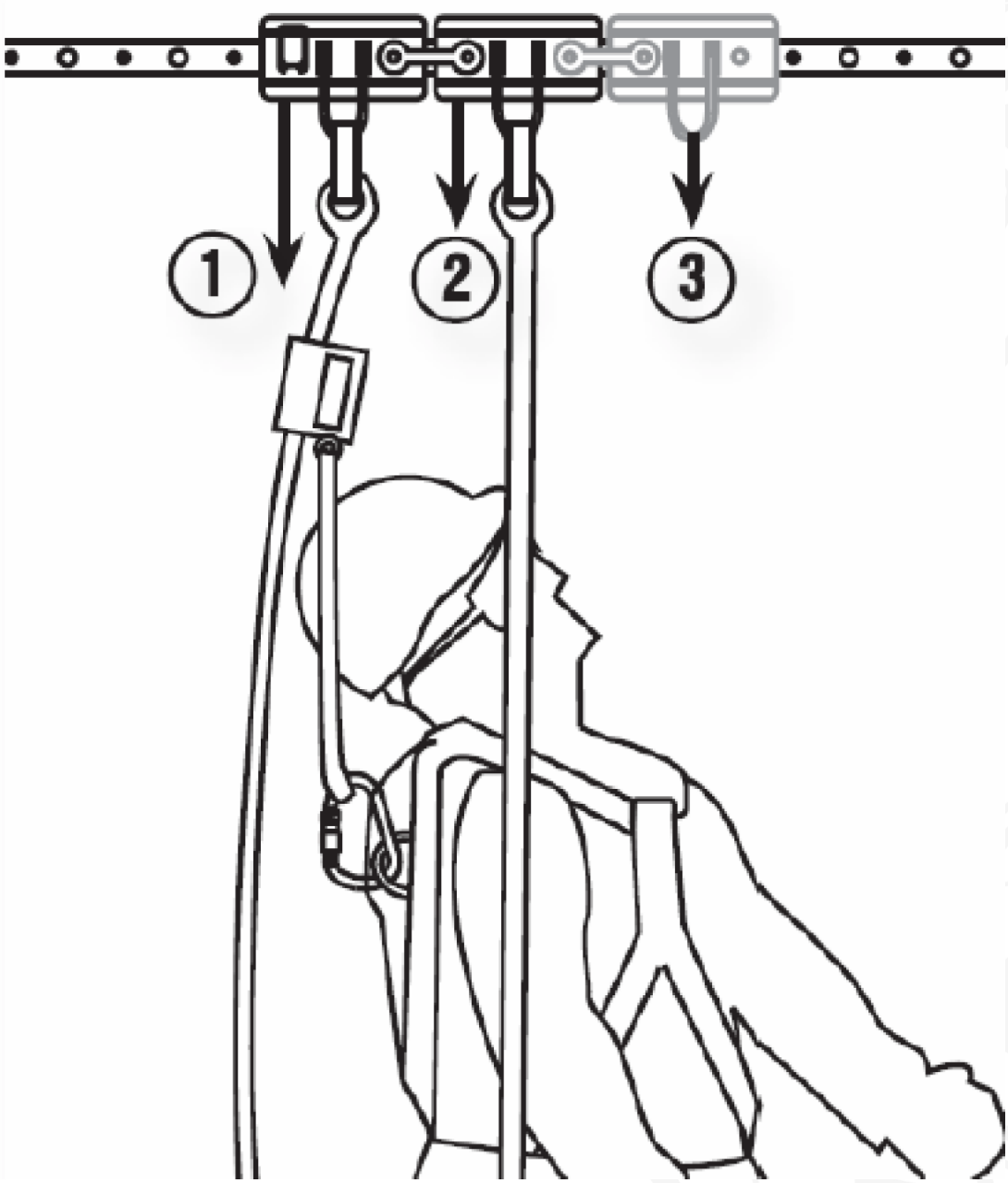
.3 Single anchoring points, pad eyes and eye bolts

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.



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[67].

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.

[67] For example, BS EN 795: 1997, Class D

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.

.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 RECREATIONAL FIRE APPLIACES

36.1 Introduction

36.1.1 The intent of this Section is to provide guidance on best practice and to facilitate the installation of Recreational Fire Appliances (RFA) such as fireplaces which use either wood, ethanol or liquefied petroleum gas (LPG) as a fuel source, charcoal galley ovens, LPG gas fired barbecues and charcoal barbecues, spit roasts and fire pits.

36.1.2 It shall be noted that this guidance will not cover every eventuality regarding the design, installation and operation of such items and that each case shall subsequently be considered separately.

36.1.3 For installations that fall outside the scope of this guidance, the use of Risk Assessments or Hazard Identification techniques (such as Failure Mode Effects Analysis (FMEA)) shall be performed to understand the potential safety related issues.

36.2 General Requirements

36.2.1 The method of securing the RFA and any of its doors or hatches in the closed position shall take into account the sea conditions likely to be experienced in service (i.e. roll, list, trim and heave) and possible damage due to mechanical impact from adjacent objects.

36.2.2 Clearance from any hot surfaces to combustible materials shall be sufficient to avoid heating combustible material to a temperature in excess of 32°C (≈90°F) above ambient and shall as a minimum be in accordance with the manufacturers recommendations but shall be at least:

36.2.3 Clearance from the exhaust duct to combustible material shall be in accordance with the requirements/recommendations of the RFA manufacturer. Where no such details are available, this distance shall be at least 230 millimetres.

36.2.4 Clearance from the sides and rear of the appliance to combustible material shall be in accordance with the requirements/recommendations of the RFA manufacturer. Where no such details are available, this distance shall be at least 460 millimetres

36.2.5 A carbon monoxide (CO) alarm on both main and emergency power shall be provided in any internal space in which an RFA is located.

36.2.6 The ventilation requirements of a space containing an RFA shall be assessed against an appropriate standard[68] and shall take into account burning equipment and persons occupying that space[69].

36.2.7 Requirements and/or recommendations published by the manufacturer of RFA shall be observed and implemented during the design and installation process.

36.2.8 The space in which any additional fuel is stored shall be treated as a service space (high risk) and shall be enclosed by 'A' Class fire rated boundaries as per the structural fire protection tables in the relevant part of the Code. See also subsections for fuel storage of different types.

36.2.9 Due consideration shall be given at the installation stage to the protection of personnel from hot surfaces and any exposed flames.

36.2.10 A dedicated portable extinguisher shall be located adjacent to externally located RFA or within the same space that the RFA is installed when internal.

36.2.11 Any insulation used in the construction shall be non-combustible.

36.2.12 Any relevant national or international standards shall be followed.

36.2.13 The combined amount of bioethanol and any petrol that may be carried onboard shall not exceed 150 litres, unless formal agreement to carry larger quantities has been obtained directly from the BMA.

36.3 Operational Requirements

36.3.1 An appropriate risk assessment shall be made when using this type of equipment and its use be covered in the vessels safety management system.

36.3.2 Maintenance for all RFA and relevant systems shall be performed by trained or familiarised crew as appropriate, in accordance with a maintenance plan produced by the manufacturer.

36.3.3 Operational instructions shall be provided and posted or otherwise readily available.

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[68] For example, the upper limit for indoor air quality standard set by the UK Dept of Health, Committee on the Medical Effect of Air Pollutants (COMEAP) for Carbon Monoxide (CO) is 10 ppm (8 - hour average)

[69] The recommended occupational level of 5000 ppm (0.5% by volume) [8 - hour average] for Carbon Dioxide (CO_2) as recommended by the UK Health & Safety Executive, publication E25.40/2005 "Workplace Exposure Limit"

36.3.4 A shipboard procedure shall be developed outlining the requirements on the use of RFA which shall be readily available to all involved, including outside caterers. This shall include a regular and thorough cleaning routine of all equipment and associated areas. The Master shall, after due inspection, decide whether to allow the use of the equipment subject to being satisfied about weather conditions and other safety factors.

36.3.5 Maintenance instructions shall be provided, which include the need for the installation to be inspected annually for soundness, freedom from deposits, operation of interlocks/alarms and correct clearances where applicable. Cleaning, maintenance and repairs shall be undertaken, if necessary, at this time. The servicing requirements shall be included in any safety management documentation.

36.3.6 Where applicable, the crew member designated as the RFA operator shall be trained in the use of the firefighting equipment and the emergency procedures onboard. They shall, in consultation with the Master, set up and agree clear lines of communication should there be an emergency incident.

36.3.7 It is not safe to use flammable liquids on a charcoal (or wood) fire to improve burning. Only use solid fuel fire lighters specifically made for lighting charcoal.

36.3.8 The disposal of any waste such as ash or coal waste shall be handled in accordance with MARPOL, the vessel's safety management system and Garbage Management Plan.

36.3.9 Where ventilators 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.

36.4 Ventilation for Internal Appliances

36.4.1 Exhaust ducts shall be constructed of steel having a wall thickness of at least 3 millimetres and shall be of a type recommended by the RFA manufacturer.

36.4.2 The duct dimensions and the capacity of exhaust air to be provided shall be in accordance with the installation advice provided by the RFA manufacturer.

36.4.3 Exhaust duct connections shall be suitably located and kept to a minimum in order to prevent the risk of leakage of exhaust gases into the yacht's internal spaces.

36.4.4 Exhaust ducts shall be provided with cleaning/inspection openings in easily accessible locations which shall be tightly closed, sealed and secured when not

in use. The exhaust ducts shall be located or shielded in order to prevent personnel from coming into contact with hot surfaces.

36.4.5 Any exhaust filters shall be in an easily accessible position for cleaning/maintenance purposes.

36.4.6 The exhaust duct penetrations of a fire rated division shall maintain the fire integrity of the bulkhead/deck.

36.4.7 Exhaust Fans (if fitted) shall be monitored and, in case of failure, an audible and visual alarm shall be activated that is received immediately by a responsible member of the crew at all times, when at sea or in port.

36.4.8 Exhaust fans and ducts shall ventilate direct to the open atmosphere and be independent of other systems and each other.

36.4.9 A manually operated damper shall be provided in the lower end of a chimney (to isolate the chimney from a fireplace in the event of a fire in the chimney), the damper arrangement in the open position shall be such that the damper does not obstruct more than 20% of the duct area, (i.e. 80% free area of chimney is available when the damper is open).

36.4.10 The chimney shall be provided with a fixed fire extinguishing system. Controls for the system shall be in a safe location outside the space or adjacent to the exit to the space. Where CO_2 is used as an extinguishing medium, the quantity of medium provided shall take into account the anticipated leakage rate associated with the outboard end of the chimney being open. Where dampers are provided to close the upper end of the chimney, means shall be provided to prevent over pressure on the duct boundaries.

36.4.11 A spark arrester (i.e. a screening device to prevent the passage of sparks and hot embers to the outside atmosphere) shall be provided at outlet ventilation openings.

36.4.12 Exhaust shall be routed to discharge directly to the outside of the vessel in a suitable area clear of any air intakes, vents from spaces or tanks containing flammable liquids and or dangerous zones which shall be located at least 3 metres away from any inlet.

36.5 Solid Fuelled Fireplaces

36.5.1 General Requirements

36.5.1.1 The proposed fireplace shall be enclosed within a steel enclosure with a glass or other heat resistant non-combustible material front being provided to prevent any burning material from falling from the burning chamber.

36.5.1.2 Should the temperature within the chimney or burning chamber exceed the RFA manufacturer's recommendations, ventilation shall be automatically shut down and the door to the burning chamber automatically locked to ensure no more fuel can be added.

36.5.1.3 A hearth of heat resisting non-combustible material (e.g. stone or tile) shall be provided in accordance with the RFA manufacturer, and be at least provided as per the following:

.1 Where the fireplace opening is less than 0.56m^2, the hearth shall extend at least 405 millimetres beyond the front of the fireplace and at least 200 millimetres beyond each side of the fireplace opening.

.2 Where the fireplace opening is greater than 0.56m^2, the hearth shall extend at least 510 millimetres beyond the front of the fireplace and at least 300 millimetres beyond each side of the fireplace opening.

.3 The hearth shall extend under the base of the fireplace.

36.5.2 Fuel Storage

36.5.2.1 Stores shall be protected by a fixed fire detection system and a sprinkler system or equivalent.

36.5.2.2 No electrical equipment other than lighting shall be located in the store.

36.5.2.3 A steel box shall be provided for ash collection and storage onboard.

36.6 Ethanol Fuelled Fireplaces

36.6.1 General Requirements

36.6.1.1 The proposed fireplace shall be enclosed within a steel enclosure suitably insulated with a steel/glass front to the fireplace.

36.6.1.2 If expressly not required by the RFA manufacturer, fireplaces fuelled by ethanol or bio ethanol may not require a chimney or vent for exhaust gas. However, as a minimum, the design shall have the following features:

.1 Fail safe concept: any electrical blackout or forced system shutdown stops the fuel injection automatically

.2 Emergency shutdown capable of manual operation

.3 Segregation of ancillaries (pump, pipework and burner): due to the compact design characteristics, all the system components shall be segregated below the fireplace housing

36.6.1.3 The fireplace shall be certified to a recognised standard[70].

36.6.1.4 The fireplace shall be locally protected by a sprinkler system, which may be manually controlled by the crew in case of emergency. The release position for the firefighting medium shall be located in a safe location outside the space or adjacent to the exit to the space and grouped with any other RFA controls as required above.

36.6.2 *Fuel Storage*

36.6.2.1 Signage, indicating the presence of flammable material and the prohibition of smoking shall be posted at the entrance to storage spaces.

36.6.2.2 Portable ethanol containers shall be of a certified type and with spill proof spout or equivalent. The amount of bio ethanol that may be carried onboard shall be to the satisfaction of the BMA.

36.6.2.3 The locker or compartment shall comply with the requirements of section 14.1.4 or 14.1.5 of the Code, as applicable.

36.6.2.4 The fuel storage containers shall be positively secured against movement and protected from damage in any foreseeable event.

36.7 LPG Fuelled Installations

37.1 LPG fuelled installations shall comply with Section 37.

36.8 Charcoal Galley Ovens

36.8.1 *General Requirements*

36.8.1.1 Suitable non-combustible insulation shall be provided directly between the base of the oven and the unit it is mounted on in order to prevent heat transmission.

36.8.1.2 Suitable ventilation air supply arrangements to be provided in accordance with the manufacturer's instructions. Supply air shall be capable of being shut off.

[70] For example, (EU) 2015/547 of 1 April 2015 on the safety requirements to be met by European standards for alcohol-powered flueless fireplaces pursuant to Directive 2001/95/EC of the European Parliament and of the Council on general product safety

36.8.1.3 A fire break and cowl to be fitted in accordance with the details provided in the manufacturer's instructions.

36.8.1.4 A carbon monoxide detector shall be provided in all cases where such appliances are installed in enclosed spaces.

36.8.2 *Operational Considerations*

36.8.2.1 Coals shall always be soaked with water after cooking as they retain their heat for long periods of time. Remove the charcoal ashes from the grill only after they are cold to the touch and no warm embers remain and place them into a metal container with a tight-fitting metal lid.

36.8.3 *Fuel Storage*

36.8.3.1 Fuel storage shall be as per this Section according to the fuel type

36.9 External Fire Pits

36.9.1 *General Requirements*

36.9.1.1 Means of securing the fire pit firmly in place shall be provided.

36.9.1.2 Deck scuppers which are located in the vicinity of the proposed location of the fire pit shall be arranged to discharge directly overboard.

36.9.1.3 Consideration and protection of overhanging decks or structures shall be made in agreement with the BMA

36.9.1.4 The use of spark guards shall be considered.

36.9.2 *Operational Considerations*

36.9.2.1 A statement confirming that the use of the fire pit shall be limited to the open deck in a safe location well clear of any combustible material (in accordance with the measurements stated in the Manufacturers Data Sheet) when the vessel is either moored or at anchor and in favourable weather conditions

36.9.2.2 Details highlighting that the burner is not to be left unattended when in use and that a portable extinguisher shall be readily available at all times.

36.9.3 *Fuel Storage*

36.9.3.1 Fuel storage shall be as per this Section according to the fuel type

36.10 Barbecues and Spit Roasts for use in Open Deck Areas

36.10.1 General Requirements

36.10.1.1 The appliance shall be sited on an open deck in a well-ventilated position, clear of any hazard, such as overhanging combustible awnings, flammable liquids, etc. Under no circumstances shall any appliances be placed internally.

36.10.1.2 In use, the appliance shall be safely secured to prevent movement caused by the vessel's motion.

36.10.1.3 A fixed collecting tray shall be secured to the deck, or directly below the appliance, and the appliance suitably screened, to prevent fat, hot ash, etc. falling onto the deck.

36.10.1.4 A suitable portable fire extinguisher shall be positioned close to the appliance along with heatproof gloves (2 pairs).

36.10.1.5 The use of spark guards shall be considered.

36.10.2 Operational Considerations

36.10.2.1 Coals shall always be soaked with water after cooking as they retain their heat for long periods of time. Remove the charcoal ashes from the grill only after they are cold to the touch and no warm embers remain and place them into a metal container with a tight-fitting metal lid.

36.10.3 Fuel Storage

36.10.3.1 Fuel storage shall be as per this Section according to the fuel type.

37 LPG INSTALLATIONS

37.1 General Requirements

37.1.1 The installation shall be in accordance with recognised national or international standards. An open flame gas appliance provided for cooking, heating or any other purpose shall comply with the requirements of a recognised standard[71].

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. Consequently, the siting of gas consuming appliances and storage containers and the provision of adequate ventilation to spaces containing them, is most important.

37.1.3 Because of the risk of carbon monoxide poisoning, gas-consuming open flame appliances shall not be installed in sleeping accommodation.

37.1.4 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, as in the case of petrol vapour.

37.1.5 A frequent cause of accidents involving LPG installations is the use of unsuitable fittings and improvised "temporary" repairs.

37.2 Stowage of Gas Containers

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 any gas which may leak can disperse overboard.

37.2.2 The vent and drain shall be not less than 19 millimetres in diameter, shall run to the outside of the craft and shall terminate 75 millimetres or more above the "at rest" waterline. Generally, the drain and locker ventilation should be 500 millimetres or more from any opening to the interior.

37.2.3 The cylinders and associated fittings shall be positively secured against movement and protected from damage in any foreseeable event.

37.2.4 Any electrical equipment located in cylinder lockers shall be certified safe for use in a potentially explosive atmosphere.

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[71] For example, EC Directive 90/396/EEC or equivalent acceptable to the BMA

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 container installations, a non-return valve shall be placed in the supply line near to the stop valve on each container. If a changeover device is used (automatic or manual), it shall be provided with non-return valves to isolate any depleted container.

37.3.3 Where 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, solid drawn copper alloy or stainless steel tube shall be used. Steel tubing, aluminium, or any materials having a low melting point shall not be used.

37.4.2 Connections 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 Lengths of flexible piping (if required for flexible connections) shall conform to an appropriate standard, be kept as short as possible, and be protected from inadvertent damage. Such flexible piping shall be installed in such a manner to allow access for inspection along its length. Proposals for a more extensive use of flexible piping (which conforms to an internationally recognised standard for its application) shall be submitted to the BMA for approval on an individual basis.

37.4.4 Any piping shall be installed in such a manner as to have as few connections as possible and not to interfere with inspection, maintenance or servicing of the appliance.

37.5 Appliances

37.5.1 All unattended appliances shall be of the room sealed type, i.e. where the gas flames are isolated in a totally enclosed shield where the air supply and combustion gas outlets are piped to open air.

37.5.2 All gas burners and pilot flames shall be fitted with a flame supervision device which shall shut off the gas supply to the burner or pilot flame in the event of flame failure

37.5.3 Flueless heaters shall be selected only if fitted with atmosphere sensitive cut-off devices to shut off the gas supply at a carbon dioxide concentration of not more than 1.5% by volume.

37.5.4 Heaters of a catalytic type shall not be used.

37.6 Gas Detection

37.6.1 Suitable means for detecting the leakage of gas shall be provided in any compartment containing a gas consuming appliance, or in any adjoining space of a compartment into which the gas (denser than air) may seep. The means of detecting leakage shall operate on both main and emergency power.

37.6.2 Gas detector heads shall be securely fixed in the lower part of the compartment in the vicinity of the gas consuming appliance and in 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.

37.6.3 Any gas detector shall be of a type which shall be actuated promptly and automatically by the presence of a gas concentration in air of not greater than 0.5% (representing approximately 25% of the lower explosive limit). The detection system shall incorporate a visible alarm and an audible alarm which can be heard in the space concerned and the control position with the vessel in operation.

37.6.4 Where electrical detection equipment is fitted, it shall be certified as being flameproof or intrinsically safe for the gas being used.

37.6.5 In all cases, the arrangements shall be such that the detection system can be tested frequently whilst the vessel is in service, which shall include a test of the detector head operation as well as the alarm circuit, in accordance with the manufacturer's instructions.

37.6.6 All detection equipment shall be maintained in accordance with the manufacturer's requirements.

37.7 Operational Considerations

37.7.1 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;

.2 When leakage is detected or suspected, all gas-consuming appliances shall be shut off at the main supply from the container(s) and **NO SMOKING** shall be permitted until it is safe to do so;

.3 Actions to increase the ventilation in the space; and

.4 **WARNING: NAKED LIGHTS SHALL NEVER BE USED AS A MEANS OF LOCATING GAS LEAKS.**

37.7.2 A check for leaks shall be made every time a gas cylinder is replaced. If it is suspected that there is a leak to the cylinder or pipework, brush soapy solution around the connections and watch for bubbles – tighten to fix but do not overtighten. Do not use the RFA until the leak is fixed. Make sure all the connections are secure before turning on the gas.

37.7.3 After use, turn off the gas cylinder before turning off at RFA controls to ensure any residual gas in the pipe work is used up.

REVISION HISTORY

Section	Description of Revision
All	First Issue