Large Yacht Code
(Yachts, Sports and Leisure Vessels over 24m in Length)

January 2025

Contents

Introduction

These technical codes are published by the Merchant Shipping Secretariat of the Ministry of Shipping under the delegated authority of the Minister as given in Merchant Shipping (Non- Convention Vessel) Regulations, No.1 of 2024 published in the Gazette No 2417/16 dated 31st December 2024 .

These technical codes relate especially to the construction of a vessel, its machinery, equipment watertight integrity, stability, safety of embarked persons and to the correct operation of non-convention vessels in Sri Lankan waters.

The codes are based and representative of the industry best practices and applicable standards taking into consideration the requirements peculiar to Sri Lanka

Compliance with the applicable code is mandatory for registration and operation of non-convention vessels in Sri Lanka on a commercial basis.

Whilst the Code sets minimum standards to be met for the issue of a Certificate, the Owner, or the Administration, may choose to enhance the provision of safety equipment, and this may be reflected in the Survey Record as an additional requirement.

Compliance with the Code in no way obviates the need for vessels and/or Vessel Operators to comply with relevant bylaws made by either the local/navigation authority or the port/harbour authority for the area in which the vessel operates.

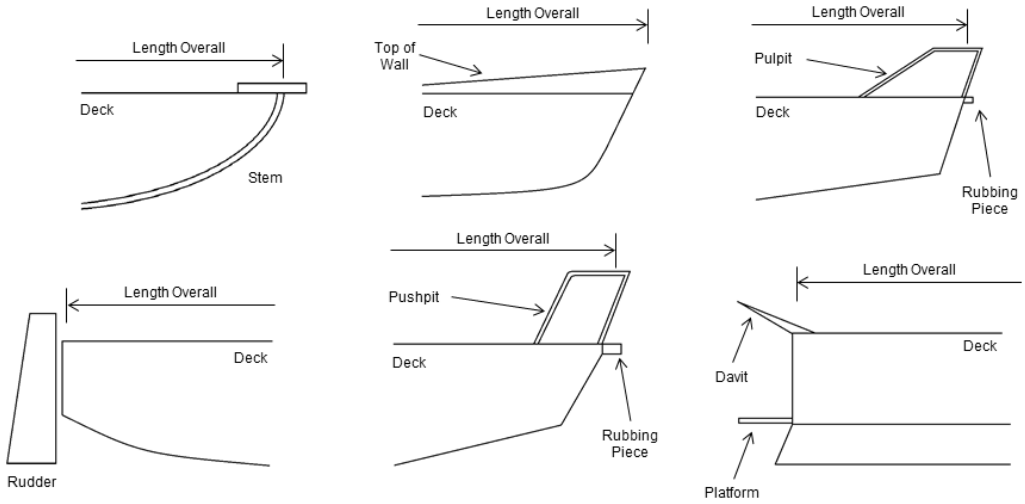
Definitions and Abbreviations

Term	Meaning
Accommodation space	A space, enclosed on all six sides by solid divisions, provided for the use of persons on board.
Approved	Means 'acceptable to' the Merchant Shipping Secretariat and does not have the same meaning as 'type approved' or 'type tested' unless otherwise specified in the Code.
Authorised person	Means a Surveyor who holds the appropriate authorisations to carry out the examinations required by the Code on behalf of the Merchant Shipping Secretariat.
Boat	A vessel of less than 24 m in length, or a vessel of less than 150gt. A boat can be a boat, air cushion vehicle, sailing craft, inflatable craft, etc.
Boats fitted with a buoyant collar	A rigid inflatable boat, or a boat of similar hull form, where the inflatable tubes are replaced by solid, or hollow, buoyant sections.
Cargo	For the purpose of the Code means all items which are transported by the vessel except fuel for the vessel, ballast (either solid or liquid), consumables to be used on board, permanent outfit and equipment of the vessel, stores and spare gear for the vessel, crew and their personal baggage and passengers and their personal baggage, and activity related equipment.
Categorised waters	Means waters the location of which are explicitly defined in the Merchant Shipping (Categorization of Waters) Regulations, No.2 of 2024, having regard for the safety of the boats which operate in those waters.
Certifying Body	A company or professional to whom the Director General Merchant Shipping has delegated the examination (survey) and certification of vessels to which the Merchant Shipping (Non- Convention Vessel) Regulations, No.1 of 2024 and technical codes apply
Code	This Code unless another Code is specified.
Compartment	All living and working spaces within the watertight or fire-resisting boundaries on any one level which have inter-communicating access.
Competent person	Means a person who by reason of relevant professional qualifications, practical experience or expertise is nominated by the Owner to carry out specialist servicing or inspections required by the Code. For example, rigging inspections, gas system servicing and testing, inclining experiments. For fire extinguishing equipment the person shall have the necessary training, experience, access to the relevant tools, equipment and information manuals and knowledge of any special procedures recommended by the manufacturer to carry out the relevant maintenance procedures.
Conning	to conduct or direct the steering of a vessel
Control position	A conning position which is continuously manned whilst the vessel is under way.
Craft	Having the same meaning as vessel.

Critical down-flooding	-Is deemed to occur when openings, having an aggregate area in square metres greater than $\frac{\text{vessels displacement in tonnes}}{1500}$ are immersed. Moreover, it is the angle at which the lower edge of the actual opening which results in critical flooding becomes immersed. All openings regularly used for crew access and for ventilation should be considered when determining the down-flooding angle. Air pipes to tanks can, however, be disregarded. Where an appropriate ISO standard is used, the definition should be taken from those standards as applicable.
Daylight	Time from sunrise to sunset.
Decked vessel	A vessel with a continuous watertight weather deck which extends from stem to stern and has positive freeboard throughout, in any condition of loading of the vessel. Where an appropriate ISO standard is used, the definition should be taken from those standards as applicable.
Design category	A description of the wind and sea conditions for which a vessel is considered suitable for in terms of construction, stability and buoyancy
Domestic voyage	A voyage from a port in Sri Lanka to the same or another port in Sri Lanka
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.
Existing Craft	Craft already in operation in Sri Lanka at the time these regulations come into force, this does not include any craft built before the entry into force date that has not been in operation in Sri Lankan waters.
Favourable weather	Means wind, sea and visibility conditions which are deemed by the Vessel Operator to be safe for a vessel to operate within the limits applied to it; or, in any other case means conditions existing throughout a voyage or excursion in which the effects either individually or in combination of swell, height of waves, strength of wind and visibility cause no hazard to the safety of the vessel, including handling ability. In making a judgement on favourable weather, the Vessel Operator should have due regard to official weather forecasts for the service area of the vessel or to weather information for the area which may be available from the National Administration or similar coastal safety organisation.
Freeboard	The distance measured vertically downwards from the lowest point of the upper edge of the weather deck to the waterline in still water or, for an open boat, the distance measured vertically downward from the lowest point of the gunwale to the waterline.
Gross Tonnage (GT)	As defined by the International Convention on Tonnage Measurement of Ships 1969 and as stated on the tonnage certificate
IMO	International Maritime Organization.
Inflatable boat	A boat which attains its form through inflatable tubes only, which are not attached to a solid hull.
Internal Waters	All water and waterways on the landward side of the baseline from which the territorial waters are measured
International voyage	Voyage outside territorial jurisdiction of SL, i.e. voyages from or to a port in the territorial waters of Sri Lanka to a port or from a port of another country

Definitions and Abbreviations

ISO	International Organization for Standardization.
Length overall	The overall length from the foreside of the foremost fixed permanent structure to the aft side of the aftermost fixed permanent structure of the vessel. With regard to inflatable, rigid inflatable boats, or boats fitted with a buoyant collar, length should be taken from the foremost part of tube or collar, to the aft most part of the tube or collar.



Length	Either 96 per cent of the total length on a waterline at 85 per cent of the least moulded depth measured from the top of the keel, or the length from the foreside of the stem to the axis of the rudder stock on that waterline, whichever is the greater. In a vessel designed with a rake of keel, the waterline on which this length is measured should be parallel to the design waterline.
Maximum permissible weight	The maximum total permissible weight of persons and their effects, cargo and activity related equipment, i.e. diving equipment.
MED	European Union Marine Equipment Directive.
Motorboat	A power-driven boat which is not a sailing boat.
Multihull vessel	Any 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 area.
National Administration	The Department of Government of the State responsible for providing, and regulating, Statutory safety Regulation in the maritime environment.
Nautical mile	A nautical mile of 1852 m.
Net tonnage (NT)	As defined by the International Convention on Tonnage Measurement of Ships 1969 and stated on the tonnage certificate
New vessel	A vessel not in possession of a Certificate issued prior to the date of this Code coming into force.
Nominated point of departure	The designated point of departure of the vessel, as specified on the vessels Certificate. Where this point lies within the Internal waters, it is to be taken as the seaward boundary of the baseline.
Non-compliances	Items or arrangements that do not meet the requirements of the Code.

Non-Convention Vessels	Vessels for which the IMO conventions do not apply, and/or vessels operating solely on domestic voyages for which the Director General of Merchant Shipping has granted exemptions from the applicable IMO conventions that apply due to the vessels GT. Where due to the GT of the vessel or area of operation parts of IMO conventions are applicable they would apply unless exemption has been granted by the DGMS
Open boat	For the application of the Code means a boat which within its length is: not fitted with a watertight weather deck; is fitted with a watertight weather deck over part of its length; or is fitted with a watertight weather deck over the whole of its length but the freeboard to the deck does not meet the minimum requirement for freeboard
Owner	The registered Owner, or the Owner or managing agent of the registered Owner or Owner, or Owner ipso facto, as the case may be.
Persons on board	Persons shall fall into one of two categories: a. Crew members. Persons carried on board the vessel to provide navigation and maintenance of the vessel, operation and maintenance of its machinery and systems (including weapon and radio-communication systems), and arrangements essential for propulsion and safe navigation or to provide services for other embarked persons. Crew members are expected to be well-disciplined and able-bodied, and have an excellent knowledge of the layout of the vessel and its safety equipment; b. Passengers and other embarked persons. Persons embarked who are not employed or engaged in any capacity on board the vessel and who do not fall into any of the other categories. Passengers and other embarked persons may include visiting dignitaries, and families. c. Special Personnel
Pilot boat	A boat employed or intended to be employed in pilotage services, and 'dedicated pilot boat' means a pilot boat of whatever size which is primarily employed in pilotage services and other occasional services undertaken such as the carriage of personnel, mail, and/or small quantities of stores to or from boats in the pilotage district.
Recess	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. Where an appropriate ISO standard is used, the definition should be taken from those standards as applicable.
Registration	The process of registering a vessel with the Merchant Shipping Secretariat of the SL Ministry of Ports and Shipping
RHIB	Rigid hulled inflatable boat having the same meaning as a RIB – a boat with inflatable tubes, attached to a solid hull. The tubes are inflated during normal craft operation.
Rigid inflatable boat (RIB)	Rigid inflatable boat having the same meaning as a RHIB – a boat with inflatable tubes, attached to a solid hull. The tubes are inflated during normal craft operation.
Safe haven	Any naturally or artificially sheltered area which may be used as a shelter by a vessel under conditions likely to endanger its safety. This may be a ship from which the vessel was deployed or an alternative mothership.
Sailing vessel	A vessel which is designed to be navigated under wind power alone and for which any motor provided is an auxiliary means of propulsion and/or which possesses a non-dimensional ratio of (sail area) divided by (volume of displacement)$^{2/3}$ of more than 7.

Definitions and Abbreviations

Ship	A waterborne vessel of more than 24m in length, or a vessel of more than 150gt
Short Range	means a vessel under 500GT, restricted to operating in area categories 4 and 5 and within 60 nautical miles of a safe haven.
Special personnel	Persons who are not members of the crew who are carried on board in connection with the special purpose of the vessel, the special work being carried out aboard the vessel or in its role as a support vessel. Special personnel (which may include scientific staff, trials personnel and equipment engineers, Surveyors, or persons under training) are expected to be disciplined and able- bodied, and have a fair knowledge of the layout of the vessel and its safety equipment
Standards	Those recognised such as BS (British Standard), EN (European Standard accepted by the European Committee for Standardization, CEN), IEC (International Electrotechnical Commission) and ISO (International Organization for Standardization) identified in the Code should include any standards
To sea	Beyond Area Category 6,7,8 and 9 waters
Vessel	A ship or a boat as defined in these regulations.
Vessel Groups	The categorisation of a vessel in accordance to its intended use as defined by the Merchant Shipping (Vessel Classification and Certification) Regulations, No.3 of 2024.
Void space	Any space, having no practical function on board the vessel, not capable of readily collecting water under normal operating circumstances.
Watertight	Capable of withstanding a pressure head of water to a specified level, usually the damage waterline. Watertight components are to be demonstrated as capable of withstanding the declared pressure head.
Weather deck	Means the main deck which is exposed to the elements.
Weathertight	Sufficient strength and integrity to withstand temporary immersion from green seas or spray. Weathertight closures are to be subject to a suitable test to confirm tightness.

Application and Interpretation

1.1. General

1.1.1. This code applies to yachts and pleasure craft over 24 metres in Length, registered and operating in area categories 0 to 5, as categorised in the "Merchant Shipping (Categorization of Waters) Regulations, No.2 of 2024", **published in the Gazette No 2417/15 dated 31st December 2024 .**

1.1.2. Vessels which intend to operate in Polar Regions must meet requirements of one of the IACS Classification Societies appropriate to the intended area of operation. Stability conditions should include those for icing. Reference to be made to the IMO Guidelines for Polar Regions, Resolution A.1024(26) as amended or replaced by IMO for yachts intended to operate inside polar regions.

1.1.3. Passenger vessels over 24m in Length are required to meet the requirements of the IMO SOLAS Convention

1.1.4. Non-Convention cargo vessels over 24m in Length are required to meet the requirements of the "Technical code for Cargo Vessels (Non-Convention Vessels) published by the Director General Merchant Shipping.

1.1.5. High Speed craft are required to meet the requirements of the IMO High Speed craft code or IACS class society equivalent.

1.1.6. Existing craft already in operation in Sri Lankan waters are only required to comply with the sections on Stability, Freeboard, Life Saving Appliances, Navigation and Pollution prevention, compliance with other sections is voluntary.

1.2. Vessel Category

1.2.1. This code applies to Group 3 and Group 4 vessels as defined in the "Merchant Shipping (Vessel Classification and Certification) Regulations, No.3 of 2024".

1.3. Design Category

1.3.1. The design category assigned to a vessel takes into consideration the standard of construction and compliance against the requirements for stability and buoyancy of the applicable design category.

1.3.2. The wind and wave limits of the respective design categories are listed and summarised in the table below.

The significant wave height is the mean height of the highest one-third of the waves, which approximately corresponds to the wave height estimated by an experienced observer, some waves may be double this height.

Design category	Wave height	Wind force (Beaufort scale)	Wind Speed -Max gust (m/s)
A	up to, and including 7m significant (H_s)	up to 10	24.4
B	up to, and including 4m significant (H_s)	up to 8	20.7
C	up to, and including 2m significant (H_s)	up to 6	13.8

D	up to and including 0.3m significant (Hs) 0.5m maximum	up to 4	7.9

1.3.3. A vessel assigned with design category "A "is considered suitable to operate in the wind and wave conditions for the category and can survive more severe conditions for a short period. Such conditions may be faced on extended voyages or in unsheltered waters exposed to wind and waves from for several hundred nautical miles.

1.3.4. A vessel assigned with design category "B" is considered suitable to operate in the wind and wave conditions for the category. Such conditions may be faced on offshore voyages of sufficient length or on exposed coasts.

1.3.5. A vessel assigned with design category "C" is considered suitable to operate in the wind and wave conditions for the category. Such conditions may be faced on exposed inland waters, bays, inlets and estuaries and in coastal waters in moderate weather conditions.

1.3.6. A vessel assigned with design category "D" is considered suitable to operate in the wind and wave conditions for the category. Such conditions may be faced on sheltered inland waters and in bays, inlets, estuaries and in coastal waters in fine weather conditions.

1.4. Area of Operation

1.4.1. The area of operation for a vessel will be assigned based on the design category of the vessel. The area categories for the waters of Sri Lankan have been defined in the regulations "Categorisation of Sri Lankan Waters" published by the Ministry of Shipping

1.4.2. For convenience the table below maps and summarises the Waterway and areas of operation categorisation against the design categories

Waterway categorisation	Areas of Operation	Design Category
Seagoing	Area Category 0	A
Coastal Waters	Area Category 1	A
	Area Category 2	B
	Area Category 3	B
Exposed Waters	Area Category 4	C
	Area Category 5	C
Internal Waters	Area Category 6	C
	Area Category 7	C
	Area Category 8	D
	Area Category 9	D

1.4.3. The owner of the vessel will need to request in the application the intended area of operation and the application must be supported with evidence that the design criteria for the intended area of operation has been complied with, the area of operation will be stated in the survey records, certification and the registration of the craft.

1.5. Standards and Equivalence

1.5.1. Designers and Builders of vessels will need to pay special regard to the intended area of operation and the working conditions to which a vessel will be subjected when selecting the materials and equipment to be used

in its construction.

1.5.2. The Builder, repairer or Owner of a vessel, as appropriate, should take all reasonable measures to ensure that a material or appliance fitted in accordance with the requirements of the Code is suitable for the purpose intended, having regard to its location in the vessel, the area of operation and the weather conditions which may be encountered.

1.5.3. Standards referenced throughout the Code are for reference information. When referencing the standards for use during construction, or supply of equipment, the latest edition of the standard should be used.

1.5.4. Any craft designed to the equivalent rules of an IACS class society and constructed under survey of the society would be deemed as having met the requirements of this technical code.

1.5.5. Any craft designed to the equivalent ISO standards or national standard and constructed under survey of the flag administration would be deemed as having met the requirements of this technical code.

1.5.6. The Merchant Shipping Secretariat has the discretion of determining equivalence, however in case of any ambiguity or applicability the issue must be referred to the technical panel of experts appointed to maintain and amend the technical codes.

1.6. Approved Equipment and Material

1.6.1. Equipment and material that is required by the Code shall be of an approved type. The Merchant Shipping Secretariat will accept equipment approvals granted by a Recognized Organization (RO) acting on behalf of the Merchant Shipping Secretariat of Sri Lanka or by the United States Coast Guard (USCG) ,Maritime Coast Guard Agency in UK(UKMCA) or Maritime administration of Japan provided, the approvals are fully in accordance with the recognized standards.

1.6.2. The Administration will also accept equipment that has been approved under the European Union Marine Equipment Directive (MED) procedures or any other recognized standards such as Sri Lanka Standards organisation and International Standard Organisation

1.7. Passenger and Crew Capacity

1.7.1. The carrying capacity of a vessel covered by this code is mainly limited by stability concerns, the total persons on board is determined as the minimum of;

- The maximum number of persons with which the craft satisfied the stability criteria.
- The maximum number of persons for whom lifesaving appliances has been provided.

1.7.2. The total persons onboard are the sum of the passengers and crew and must not exceed the maximum number as determined as determined in section 1.7.1

1.7.3. No vessel to which the Code applies should carry more than 12 passengers on a voyage or excursion. The following meanings apply:

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

(a) a person employed or engaged in any capacity on board the ship on the business of the ship;

(b) a person on board the ship either in pursuance of the obligation laid upon the master to carry shipwrecked, distressed or other persons, or by reason of any circumstances that neither the master nor the owner nor the charterer (if any) could have prevented; and

(c) a child under one year of age; and

"a person employed or engaged in any capacity on board the vessel on the business of the vessel" may reasonably include:

.1 bona-fide members of the crew over the minimum school leaving age (about 16 years) who are properly employed on the operation of the vessel;

.2 person(s) employed either by the owner or the charterer in connection with business interests and providing a service available to all passengers; and

.3 person(s) employed either by the owner or the charterer in relation to social activities on board and providing a service available to all passengers.

1.7.4. With reference to .2 and .3 above, such persons should be included in the crew list required for the vessel, should have received on board familiarisation training as required by STCW, and should not be assigned duties on the muster list.

1.8. Interpretation

1.8.1. Where question of application of the Code, or an interpretation of a part of the Code arises, the owner/managing agent of the vessel concerned should in the first instance seek clarification from the Certifying Body. In situations where it is not possible to resolve an issue of interpretation a decision may be obtained on written application to the Merchant Shipping Secretariat, who may consult with the technical panel of experts appointed to develop and maintain the technical codes

Inspections Certification and Maintenance

2.1. General

2.1.1. All non-convention vessels in commercial service in Sri Lankan waters are required to have a valid Certificate for the vessel issued by the Merchant Shipping Secretariat

2.1.2. A certificate will be issued by the Merchant Shipping secretariat upon completion of all items on the survey report.

2.1.3. The plans and drawings of the vessel must be submitted to an approved certifying body for appraisal.

2.1.4. The vessel must be built under survey by an approved certifying body, and upon completion of the vessel an Interim survey report must be completed and forwarded to the Merchant Shipping Secretariat.

2.2. Survey & Inspections

2.2.1. All non-convention vessels are required to have an initial survey, annual surveys, intermediate survey and a renewal survey to maintain valid certification and registration.

2.2.2. All surveys & inspections are to be carried out by surveyors from an approved certifying body of by the surveyors of the Merchant Shipping Secretariat

2.2.3. Annual, intermediate and renewal surveys should be carried out within 3 months either side of the anniversary date of the initial survey compliance examination date to maintain the certification.

2.2.4. Should an annual, intermediate examination not be carried out within the permitted range, the Certificate will be automatically suspended, and the Owner notified of the suspension and the vessel will be required to undergo a renewal survey or an initial survey dependent on the condition of the craft and the elapsed time from the last survey.

2.2.5. At renewal survey the craft would need to be examined out of the water paying special attention to the exterior hull condition, through-hull valves and exterior rudder and propulsion equipment in the presence of an authorised surveyor and the survey results documented.

2.2.6. Craft built of wood and similar material are required to be examined out of the water at the Intermediate survey in addition to the renewal survey. The Merchant Shipping Secretariat may at its discretion considering the age, area of operation may require out of water examinations to be at lesser interval as required.

2.2.7. The Merchant Shipping Secretariat may at its discretion considering the hull construction material, age, type, service and area of operation may require out of water examinations to be at lesser interval as required.

2.2.8. Initial Survey - The Owner shall arrange for a full examination of the vessel and its systems. Part of the examination shall be conducted with the vessel out of the water, the following areas will need to be addressed;

- approved construction plans, and drawings must be submitted to the surveyor and the surveyor must be satisfied that the vessel has been designed and built in accordance to this technical doe or equivalent standard
- For existing vessels considered on the basis of safe history of vessel or of design, the surveyor must be satisfied that the requirements of Structural strength are fulfilled with regard to confirmation of

that safe history and supported by an appropriate structural survey and technical specification.

- The arrangements, fittings and equipment provided on the vessel are to be documented on the Survey Record and should be in compliance with this code and copies of any required declarations should be retained for the vessels technical file.
- Where a vessel is required to have approved stability information, the Owner must be in possession of an approved Stability Information Booklet before the Certificate can be issued.
- For all other vessels, the Owner should provide the information necessary to confirm that the stability of the vessel meets the standard required by the Code for the permitted area of operation and intended use of the vessel.
- Upon satisfactory completion of the examination and review of the documented arrangements, hull structure, machinery, fittings and equipment provided in compliance with the Code, and approval as appropriate of either the Stability Information Booklet or required stability information and the conduct of the stability test, the survey reports must be completed and finalized and the Certificate for the requested area of operation would be issued.

2.2.9. Annual Survey - The Owner shall arrange for an annual examination of the vessel and its systems within 3 months either side of the anniversary date of the initial/renewal examination, at intervals not exceeding 15 months. the following areas will need to be addressed;

- In the case of a dedicated pilot boat and, under certain circumstances a boat with pilot boat endorsement, the hull and associated fittings are, additionally, to be examined out of the water, the following areas will need to be addressed.
- The annual examination shall be general or partial examination of the vessel, its machinery, fittings and equipment, as far as can readily be seen, to ascertain that it has been satisfactorily maintained as required by the Code and that the arrangements, fittings and equipment provided are as documented in the Survey Record.
- On satisfactory completion of the annual examination, the authorised surveyor should enter a record of the examination on the Certificate and Survey record.

2.2.10. Intermediate Survey - The Owner shall arrange for an intermediate examination of the vessel and its systems at least once during the life of the Certificate, in order that the interval between successive examinations by an authorised person does not exceed three years and 3 months. The intermediate survey would replace the annual survey that is due between the 2nd and 4th year of the life of the certificate. An intermediate survey may be an out of water survey as required by clause 2.2.6 and 2.2.7. The following areas will need to be addressed.

- The scope of the survey would be similar to an annual survey, unless an out of water survey is required.
- In the case of an out of water survey the scope would be similar to a renewal survey

2.2.11. Renewal Survey - The Owner shall arrange for a renewal examination of the vessel and its systems prior to the expiry of the current certificate. Part of the examination shall be conducted with the vessel out of the water, the following areas will need to be addressed;

- Upon satisfactory completion and verification that the arrangements, fittings and equipment documented in the Survey Record, remain in compliance with the Code and that the vessel and its machinery are in a sound and well maintained condition, the Certificate in force should be endorsed to indicate a 3 month extension
- Copies of the survey record and report must be submitted to the merchant Shipping Secretariat
- The Merchant Shipping Secretariat will renew the vessel's Certificate if it is satisfied that the arrangements, fittings, and equipment documented in the Survey Record are in compliance with the Code.

2.3. Certification

2.3.1. A Certificate should be valid for not more than 5 years from the date of examination of the vessel out of the water by the authorised person. The Certificate may be valid for a lesser period as determined by the Merchant Shipping Secretariat.

2.3.2. For a newly constructed vessel, built under full construction survey for the purposes of this Code, the Certificate may begin from the final in-water compliance survey if less than 12 months from the last out of water date.

2.3.3. A signed and authenticated copy of the Certificate and the associated Survey Record is to be retained on board the vessel. Where it is not reasonable to keep these aboard, they may be retained on shore, but must be made available if requested by any person in authority.

2.3.4. The renewal Certificate should be valid for not more than 5 years from the expiry of the existing Certificate, so long as the renewal examination was completed within three months prior to the expiry of the existing Certificate. If the renewal examination is conducted more than three months prior to the expiry of the existing Certificate, the Certificate should be valid for not more than 5 years from the completion date of the renewal examination

2.4. Reporting of non-compliances identified during periodical examinations

2.4.1. On completion of an examination, non-compliances will be reported to the Owner by letter/email with the action required. The nature of the non-compliances will determine whether a Certificate can be issued or endorsed at the time or whether certain corrective actions must be completed before the Certificate can be signed or endorsed. A priority will be assigned to each defect as follows:

- . Priority 1 - Critical defect

A renewal Certificate will not be issued, and an existing Certificate will be suspended. On rectification of the non- compliances the Owner shall arrange a re-inspection of the vessel. The Certificate may be signed/endorsed upon satisfactory completion of the re-inspection.

- Priority 2 – Important defect

The Certificate may be signed or endorsed with a time frame specified for rectifications to be made; or

Issue of the Certificate or endorsement may be held in abeyance. Upon completion of remedial actions the Owner shall provide evidence of the completed work to the attending Surveyor within the agreed time period for action. Evidence shall be as agreed with the attending Surveyor and could include copies of Certificates, photographs or a written confirmation of actions.

If the Owner fails to provide evidence of the completed work to the attending Surveyor within the agreed time period, the Certificate will be automatically suspended.

- Priority 3 - Other non-compliances

These are most likely to be items of loose equipment that were not available at the time of examination. It is recognised that many vessels are seen at maintainers' premises and the loose equipment is retained at the Vessel Operator's base. In some cases operating units have spare vessels to cover for maintenance periods and breakdown and interchange loose equipment between the in-service vessels. The Vessel Operator shall be responsible for ensuring the loose equipment is on board prior to sailing, in a serviceable condition, serviced and in date where applicable.

2.5. Repairs and Maintenance

2.4.2. The Merchant Shipping Secretariat may examine a certificated ship at any time

2.4.3. It is the responsibility of the Owner to ensure that at all times a vessel is maintained and operated in accordance with the requirements of the Code, the arrangements as documented in Survey Record and any conditions

stated on the vessel's Certificate

2.4.4. It is the responsibility of the Owner to ensure that the vessel is maintained in accordance with manufacture's recommendations or best engineering practice. If for any reason the vessel does not continue to comply with any of these requirements, the Owner should notify the Merchant Shipping Secretariat immediately.

2.4.5. Repairs or alterations to the hull, machinery or equipment that is covered by the requirements of this code and which affect the safety of the vessel shall not be made without the approval of the Merchant Shipping Secretariat, except in an emergency. Drawings or written specifications of proposed alterations should be submitted to the Merchant Shipping Secretariat and the certifying body in advance for appraisal and approval to proceed.

2.4.6. Safe working practices shall be observed in the planning and execution of any alterations, repairs or other operations involving riveting, welding, burning or other fire producing actions aboard a vessel particularly where these take place adjacent to fuel tanks or apparatus connected to the fuel tanks

2.4.7. Repairs, alterations and modifications of a major character and outfitting related thereto on existing vessels shall meet the requirements prescribed for a new vessel to such extent as the Merchant Shipping Secretariat deems reasonable and practicable. The owner shall inform the Merchant Shipping Secretariat of the proposed alterations and modifications before such alterations and modifications are carried out

2.4.8. For the purpose of the Code, the following repairs, alterations and modifications shall be recognized as being of "major character":

any changes that substantially alter the dimensions of the vessel;

any changes that substantially increase a vessel's service life; or

any conversions that alter the functional aspects of the vessel

2.4.9. In cases where the vessel suffers major damage, e.g. as a result of a collision, grounding, fire or other event, the Owner must notify the Merchant Shipping Secretariat immediately, explaining the circumstances by which the vessel became damaged. The nature and extent of major repairs are subject to the approval of the Merchant Shipping Secretariat

2.4.10. Minor damage, detrimental to the safety of the vessel, must also be reported to the Merchant Shipping Secretariat, together with the measures proposed to effect repairs, who may take action as it may deem appropriate which may include a full or part examination of the vessel.

Construction and Structural Strength

3.1. General

3.1.1. The design of the hull structure, its construction, and the materials and equipment used should be suitable for the service intended and provide adequate strength and service life for the safe operation of the vessel at its service draught and maximum speed. The design should also withstand the conditions likely to be encountered in the intended area of operation

3.1.2. All vessels should have a freeboard deck

3.1.3. All vessels should 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.

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

3.1.5. The choice of hull construction material affects fire protection requirements, for which reference should be made to section 12.

3.1.6. Where a considerable risk of lightning strike is identified vessels should have lightning strike protection.

3.2. Structural Strength

3.2.1. All vessels must be designed, constructed and maintained in accordance with the requirements of an IACS Classification Society.

3.2.2. Where ballast is added for stability considerations attention should be paid to local and global hull strength requirements.

3.2.3. For existing vessels, constructed before this code came into effect, the operator should be able to demonstrate a recent history of safe operation in a similar or more onerous operating category by this vessel

3.3. Decks

3.3.1. The watertight weather deck should extend from stem to stern and have positive freeboard throughout, in any condition of loading of the Vessel.

3.3.2. Decks should be suitable for the intended loading.

3.4. Watertight Bulkheads

3.4.1. Section 6 of the Code deals with subdivision and damage stability requirements which will determine the number and positioning of watertight bulkheads defined below.

3.4.2. Watertight bulkheads should be fitted in accordance with the following requirements:

1) The strength of watertight bulkheads and their penetrations, and watertight integrity of the division should be in accordance with the requirements of the Classification Society.
2) Watertight bulkheads must extend to the weather deck/freeboard deck
3) Generally, openings in watertight bulkheads should comply with the standards required for passenger vessels, as defined in SOLAS **Chapter II-1**. Hand operation from above the bulkhead deck and a hydraulic accumulator may be omitted if each door has it's 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.
4) 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 and visual alarms should be provided in the wheelhouse.
5) Unless otherwise required by section 3.5, watertight doors in vessels under 500GT 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.
6) Procedures for the operation of watertight doors should be agreed with the Administration and posted in suitable locations. Watertight doors should 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 should also be closed. All watertight doors should be operationally tested before a ship sails and once a week.

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

3.5.1. 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, should 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 3.4.2, or for vessels under 500GT, hinged doors complying with 3.5.2

3.5.2. For vessels under 500GT, 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) sill height of the internal door should be higher above the deepest loaded waterline than the sill height of the shell opening.

3.5.3. Openings in the hull should comply with SOLAS regulation II-1/15-1 - External openings in cargo ships. Provision should 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 600mm above the Design Waterline.

3.5.4. Openings in the hull with a sill height below, or less than 600mm above the Design Waterline may be specially considered by the Administration. This consideration may include but is not limited to:

1. Doors from the space providing internal access are to have a sill height at least 600mm 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.

3.6. Rigging and Sails on Sailing Vessels

3.6.1. The condition of the rig should be monitored in accordance with a Maintenance Manual and a planned maintenance schedule. The schedule should include, in particular, regular monitoring of all the gear associated with safe work aloft and on the bowsprit (see 19.3).

3.6.2. Dimensions and construction materials of masts and spars and dimensions of standing rigging including connection to chain plates should be in accordance with the requirements or recommendations of the Classification Society or a recognised national or international standard.

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

3.6.4. Compliance with 3.6.2 and 3.6.3 should be confirmed by a design review and approval by the Classification Society (e.g. Rig Design Certificate) which is assigned with the review of the rig.

3.6.5. The Maintenance Manual provided by the mast manufacturer should be reviewed and approved by the Classification Society which is assigned to review the rig design.

3.6.6. 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 Classification Society that is involved with the classification of the vessel's hull.

3.6.7. Annual surveys on the vessel should include reviewing records and history of rig maintenance measures against the specifications provided by the maintenance manual.

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

3.6.9. Adequate means of reefing or shortening sail should be provided.

3.6.10. Sailing vessels operating as Short range vessels need not carry storm canvas.

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

Watertight and Weathertight Integrity

4.1 Weathertight Integrity

4.1.1 A vessel should be constructed so that in the most extreme conditions expected in the area of operation, openings do not allow ready ingress of water, which might threaten the safety of the vessel and those onboard.

4.1.2 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

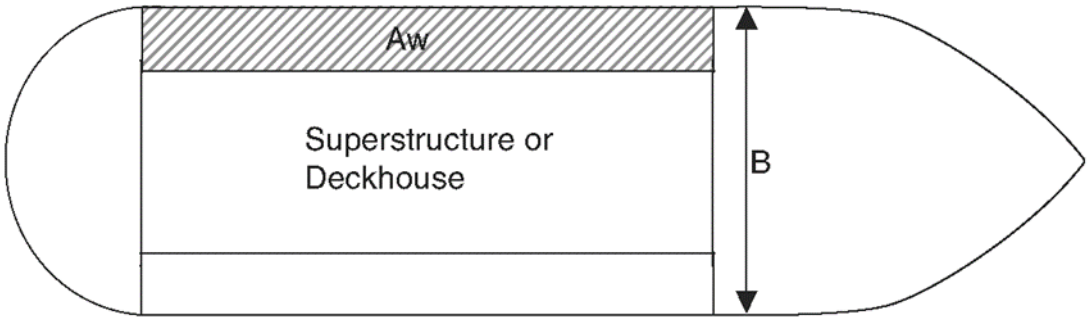
4.1.3 For vessels up to 75m load line length, a standard superstructure height is to be taken as 1.8m. For vessels over 125m load line length, this is to be taken as 2.3m. Superstructure heights for vessels of intermediate lengths should be obtained by interpolation

4.2 Water Freeing arrangements/Deck Drainage

4.2.1. The standards for water freeing arrangements should comply with ICLL 66 as far as it is reasonable and practicable to do so

4.2.2. In any case the intention should be to achieve a standard of safety which is at least equivalent to the standard of ICLL 66.

4.2.3. 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:



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

Where;

FP_{REQ} = Freeing port area required

A_w = Area of well in way of superstructure or deckhouse

B = Full beam at deck,

4.2.4. On sailing vessels, where the solid bulwark height does not exceed 150mm, specific freeing ports, as defined above, are not required on each side of the vessel for the well concerned:

4.2.5. In individual cases, when the Director General Merchant Shipping considers that the requirements of ICLL cannot be met, the Director General Merchant Shipping may consider and approve alternative arrangements to achieve

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

4.2.6. For Short range vessels it is considered that the requirement for freeing port area for a forward or after 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 should 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 will allow the well to drain in less than 3 minutes.

4.2.7. In considering an individual case, the Director General Merchant Shipping will take into account the vessels past performance in service and the declared area(s) of operation and any other conditions which restrict the use of the vessel at sea which will be recorded on the load line certificate issued to the vessel. (See section 3.1.4.)

4.3 Recesses

4.3.1. Any recess in the weather deck should be of weathertight construction and should be self-draining under all normal conditions of heel and trim of the vessel.

4.3.2. A swimming pool or spa bath, open to the elements, should be treated as a recess.

4.3.3. The means of drainage provided should be capable of efficient operation when the vessel is heeled to an angle of 10º in the case of a motor vessel, and 30º in the case of a sailing vessel.

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4.3.4. 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.

4.3.5. When it is not practical to provide drainage, which meets the requirements of section 4.3.3 and 4.3.4, alternative safety measures may be proposed for approval by the Director General Merchant Shipping. 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

4.4 Hatchways and Skylight Hatches

4.4.1. 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

4.4.2. All exposed hatchways which give access from position 1 and position 2 are to 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

4.4.3. Hatches which are designated for escape purposes should be provided with covers which are to be openable from either side and in the direction of escape they are to be openable without a key. All handles on the inside are to be non-removable. An escape hatch should be readily identified and easy and safe to use, having due regard to its position.

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

4.5 Doorways and Companionways

4.5.1. Doorways Located Above the Weather Deck

External doors in deckhouses and superstructures that give access to spaces below the weather deck are to be weathertight and door openings should have coaming heights of at least:

Location	Unrestricted vessels	Short range vessels
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.

Weathertight doors should be arranged to open outwards and when located in a houseside, 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.

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 vessels	Short range vessels
Position 1	600mm	450mm
Position 2	380mm	200mm

Coaming height, 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.

4.5.2. Companion Hatch Openings

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 300mm above the deck, or 150mm in the case of Short range vessels.

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 are to be made to ensure that they are retained in a secure location.

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

4.6 Skylights

4.6.1. All skylights should be of efficient weathertight construction and should be located on or as near to the centreline of the vessel as practicable.

4.6.2. If they are of the opening type they should be provided with efficient means whereby they can be secured in the closed position.

4.6.3. Skylights which are designated for escape purposes should be openable from either side, and in the direction of escape they are to be openable without a key. All handles on the inside are to be non-removable. An escape skylight should be readily identified and easy and safe to use, having due regard to its position.

4.6.4. The skylight glazing material and its method of securing within the frame should meet an appropriate national or international standard. Recognised Classification Society rules for "ships" are considered to meet these requirements. Where a recognised Classification Society produces alternative rules for "pleasure vessels" or "yachts", these are considered appropriate for such vessels in area categories 4 and 5.

A minimum of one portable cover for each size of glazed opening should be provided which can be accessed rapidly and efficiently secured in the event of a breakage of the skylight.

4.7 Portlights

4.7.1. Portlights should be of strength appropriate to location in the vessel and meet an appropriate national or international standard. Recognised Classification Society rules for “ships" are considered to meet these requirements. Where a recognised Classification Society produces alternative rules for "pleasure vessels" or "yachts", these are considered appropriate for Short range vessels. With regard to structural fire protection, the requirements for the construction of certain portlights should meet the requirements of Section 12.

4.7.2. In general, all portlights fitted in locations protecting openings to spaces below the weather deck or fitted in the hull of the vessel should be provided with a permanently attached deadlight which is to be capable of securing the opening watertight in the event of a breakage of the portlight glazing. Proposals to fit portable deadlights will be subject to special consideration and approval by the Administration, having regard for the location of the portlights and the ready availability of deadlights. Consideration should be given to the provision of operational instructions to the Master as to when deadlights must be applied to portlights.

4.7.3. Portlights fitted in the hull of the vessel below the level of the freeboard deck should be either non-opening or of a non-readily openable type and be in accordance with a standard recognised by the Administration. The lower edge of the portlights should be at least 500mm or 2.5% of the breadth of the vessel, whichever is the greater, above the all-seasons load line assigned to the vessel. Portlights of the non-readily opening type must be secured closed when the vessel is in navigation and indication provided on the bridge that they are closed.

4.7.4. Proposals to fit large portlights (i.e. greater than 0.16 M2) in the main hull below the level of the freeboard deck will be subject to special consideration and approval by the Administration, having regard for their location and strength and their supporting structure and, the availability of strong protective covers for them. One item of the special consideration should be operational instructions to the Master as to when the strong protective covers must be fitted.

4.7.5. Portlights should not be fitted in the hull in the way of the machinery space.

4.8 Windows

4.8.1. Windows should be of strength appropriate to their location in the vessel and meet the requirements of BSMA 25 or equivalent international standard. Recognised Classification Society rules for "ships" are considered to meet these requirements.

4.8.2. Where a recognised Classification Society produces alternative rules for "pleasure vessels" or "yachts", these are considered appropriate for such vessels in area categories 4 and 5. With regard to structural fire protection, the requirements for the construction of certain windows should meet the requirements of section 12.

4.8.3. For all vessels where the glazing material, glazing thickness, or fixing of the windows does not meet the requirements of a recognised standard, windows may be tested, to the satisfaction of the Administration, at a minimum of 4 times the required design pressure derived from an appropriate national or international standard. Additionally, as a minimum, calculated thicknesses should meet Classification Society requirements for pleasure vessels or yachts. For Short range vessels, test pressures may be reduced to 2.5 times the derived design pressure.

4.8.4. When using BSMA 25 or equivalent standard, the following minimum design heads may be assumed when determining design head pressure:

First tier unprotected fronts	4.5 + L/100metres
Second tier unprotected fronts	3.5 metres
Elsewhere	1.5 metres

4.8.5. In general, windows fitted in superstructures or weathertight deckhouses are to be substantially framed and efficiently secured to the structure. The glass is to be of the toughened safety glass type.

4.8.6. Where chemically toughened safety glass is used, windows are to be of the laminated type, the minimum depth of chemical toughening to be 30 microns on exposed faces. Regular inspections of the windows, with particular reference to the surface condition, should form part of the operational procedures and annual survey by a Classification Society.

4.8.7. Windows should not be fitted in the main hull below the level of the freeboard deck.

4.8.8. For all vessels, other than Short range vessels, storm shutters (strong protective covers with fittings) are required for all windows in the front and sides of first tier and front windows of the second tier of superstructures or weathertight deckhouses above the freeboard deck.

4.8.9. Where windows are of laminated construction and their equivalent toughened safety glass thickness exceeds the requirements of the applied standard specified in 4.8.1 by a minimum of 30%, storm shutters need not be carried, but a blanking plate(s) is to be provided (a plate capable of being fixed over a broken window) so that any window opening may be sealed in the event of glass failure. For windows subject to test in accordance with 4.8.3 only blanking plates are required.

When storm shutters are interchangeable port and starboard, a minimum of 50% of each size should be provided.

4.8.10. Side and front windows to the navigating position should not be constructed of polarised or tinted glass.

4.9 Ventilators and Exhausts

4.9.1. Adequate ventilation is to be provided throughout the vessel. The accommodation is to 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 should be fitted in a gas tight trunk or each space should be fitted with a carbon monoxide detector, having an alarm provided locally and at a continuously manned station.

4.9.2. Ventilators are to be of efficient construction and provided with permanently attached means of weathertight closure. Generally, ventilators serving any space below the freeboard deck or an enclosed superstructure should have a coaming of minimum height of:

Location	Unrestricted vessels	Short range vessels
Forward quarter length	900mm	450mm
Elsewhere	760mm	380mm

4.9.3. Ventilators should 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.

4.9.4. 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 down flooding angle on stability standard. (See section 6).

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

4.9.6. Engine exhaust outlets which penetrate the hull below the freeboard deck should be provided with means to prevent back flooding into the hull through a damaged exhaust system. For vessels operating on unrestricted service a positive means of closure should be provided. The system should be of equivalent construction to the hull on the outboard side of the closure. For Short range vessels, where the fitting of a positive closure is not practicable, the exhaust should be looped up above the waterline on the outboard side of the system, to a minimum height of 1000mm, and be of equivalent construction to the hull.

4.10 Air Pipes

4.10.1. Air pipes serving fuel and other tanks should be of efficient construction and provided with permanently attached means of weathertight closure. Means of closure 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.

4.10.2. Where located on the weather deck, air pipes should 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 should have a minimum coaming height of:

Location	Unrestricted vessels	Short range vessels
On weather deck	760mm	380mm
Elsewhere	450mm	225mm

4.10.3. Air pipes to fuel tanks should terminate at a height of not less than 760mm 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.

4.11 Scuppers, Sea Inlets and Discharges and Other Hull Penetrations

4.11.1. The standards of ICLL should 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 should be provided with efficient shut-off valves arranged in positions where they are readily accessible at all times.

4.11.2. Underwater lights and associated penetrations fitted in the hull should be approved by the Classification Society.

4.12 Materials for Valves and Associated Piping

4.12.1. Valves which are fitted below the waterline should 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.

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

4.12.3. Where the use of plastic piping is proposed, it will be considered and full details of the type of piping, its intended location, and use, should be submitted for approval; with regard to watertight integrity, any plastic piping should be above the waterline. Due regard should be paid to the IMO Fire Test Procedures Code, and section 12.

4.12.4. The use of flexible piping in any location should 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 should be approved as fit for the purpose.

4.13 General Equivalence

Where vessels cannot fully comply with the requirements of this section, equivalent arrangements may be considered by the Administration. Such proposals should take into account the following, although this should not be considered as an exhaustive list:

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

Freeboard

5.1. General

5.1.1. The freeboard for the vessel and its marking should be approved by the Assigning Authority for the assignment of freeboard and issue of the International Load Line Certificate (1966).

5.1.2. Vessels should comply with ICLL for the assignment of a freeboard mark which corresponds to the deepest loading condition included in the stability formation booklet for the vessel.

5.1.3. The freeboard assigned should be compatible with the strength of hull structure, intact and damage stability requirements for the vessel, and should ensure that minimum bow height requirements are met

5.1.4. The Assigning Authority should provide the owner(s)/managing agent(s) of the vessel with a copy of the particulars of the freeboard assigned and a copy of the record of particulars relating to the conditions of assignment.

5.2. Freeboard Mark and Loading

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

5.2.2. The fresh water freeboard allowance should be obtained by deducting from the all-seasons freeboard assigned, the quantity

$\Delta/4T$ millimetres

where:-

Δ = displacement in salt water in tonnes at the all-seasons draught

T = 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.

5.2.3. A vessel should 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.

5.3. Datum Draught Marks

5.3.1. Datum draught marks should 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 maybe single datum lines.

5.3.2. The marks should 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 should be above, but within 1000mm, of the deepest load waterline.

5.3.3. The draught to which marks relate should be indicated either above the mark on the hull and/or in the stability information booklet for the vessel. The position of the marks should be verified at initial placement by the Director General Merchant Shipping or the vessel's Assigning Authority.

Stability

6.1. General

6.1.1. This section deals with the standards for both intact and damage stability.

6.1.2. An intact stability standard proposed for assessment of a vessel type not covered by the standards defined in the Code should be submitted to the Director General Merchant Shipping for approval at the earliest opportunity.

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

6.2. Intact Stability Standards

6.2.1. Monohull Motor vessels

– The curves of statical stability for seagoing conditions should meet the following criteria:

1) the area under the righting lever curve (GZ curve) should not be less than 0.055 metre-radians up to 30º angle of heel and not less than 0.09 metre- radians up to 40º 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 30º and 40º or between 30º and the angle of downflooding if this is less than 40º, should not be less than 0.03 metre-radians;
3) the righting lever (GZ) should be at least 0.20 metres at an angle of heel equal to or greater than 30º;
4) the maximum GZ should occur at an angle of heel of preferably exceeding 30º but not less than 25º;
5) after correction for free surface effects, the initial metacentric height (GM) should 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 1) to 5) the Director General Merchant Shipping may be consulted for the purpose of specifying alternative but equivalent criteria.

6.2.2. Monohull Vessels operating as Short range vessels

– Where Short range vessels are unable to meet the criteria above, the following criteria may be used:

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

$$Areq = 0.055 + 0.001(30^{o} - \theta max) \text{ metre.radians}$$

where θmax 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 30º and 40º or between 30º and the angle of downflooding if this is less than 40º, should not be less than 0.03 metre-radians;
3) the righting lever (GZ) should be at least 0.20 metres at an angle of heel equal to or greater than 30º;
4) the maximum GZ should occur at an angle of heel not less than 15º;
5) after correction for free surface effects, the initial metacentric height (GM) should not be less than 0.15 metres.

6.2.3. Multi-hulls

– The curves of statical stability for seagoing conditions should meet the following criteria:

1) the area under the righting lever curve (GZ curve) should not be less than 0.075 metre-radians up to an angle of 20º when the maximum righting lever (GZ) occurs at 20º and, not less than 0.055 metre-radians up to an angle of 30º when the maximum righting lever (GZ) occurs at 30º or above. When the maximum

GZ occurs at angles between 20º and 30º the corresponding area under the GZ curve, Areq should be taken as follows:-

Areq = 0.055 + 0.002(30-θmax) metre.radians;

where θmax 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 30º and 40º, or between 30º and the angle of downflooding if this is less than 40º, should not be less than 0.03 metre-radians;
3) the righting lever (GZ) should be at least 0.20 metres at an angle of heel where it reaches its maximum;
4) the maximum GZ should occur at an angle of heel not less than 20º;
5) after correction for free surface effects, the initial metacentric height (GM) should not be less than 0.15 metres; and
6) if the maximum righting lever (GZ) occurs at an angle of less than 20º approval of the stability should be considered by the Director General Merchant Shipping as a special case.

6.2.4. 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.

6.2.5. Superstructures

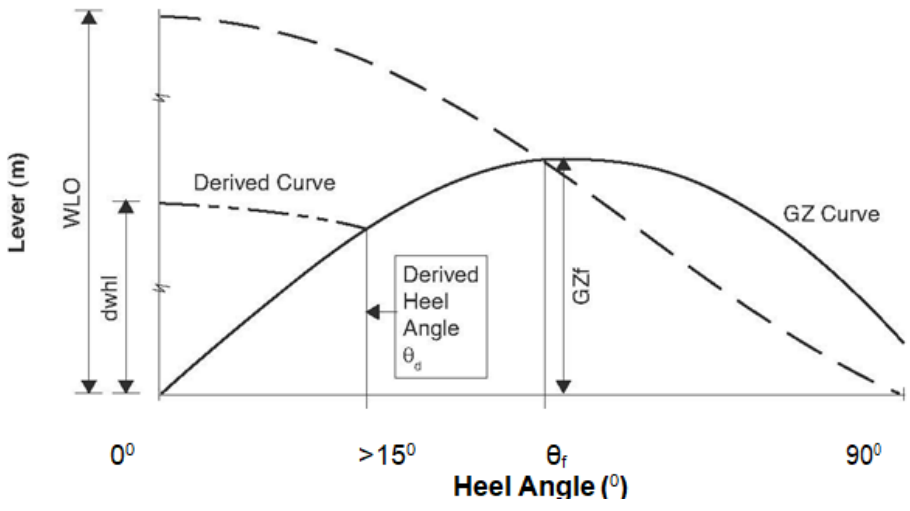
- The buoyancy of enclosed superstructures complying with regulation 3(10)(b) of the ICLL may be taken into account when producing GZ curves.
- Superstructures, the doors of which do not comply with the requirements of regulation 12 of ICLL, should not be taken into account.

6.2.6. High Speed Vessels

- In addition to the criteria given in sections 6.2.1 to 6.2.5 above designers and builders should 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).

6.2.7. Mono Hull Sailing vessels

- The intact stability should conform to the following requirements
  1) Curves of statical stability (GZ curves) for at least the Loaded Departure with 100% consumables and the Loaded Arrival with 10% consumables should be produced.
  2) The GZ curves required by 1) should have a positive range of not less than 90º.For vessels of more than 45m, a range of less than 90º may be considered but may be subject to agreed operational criteria.
  3) In addition to the requirements of 2), the angle of steady heel should be greater than 15 degrees (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 1).



In the figure;

'dwhl' = the "derived wind heeling lever" at any angle θ

$= 0.5 \times WLO \times \cos^{1.3}\theta$

Where;

WLO= is the magnitude of the actual wind heeling lever at 0° which would cause the vessel to heel to the 'down flooding angle' θ_f or 60° whichever is least.

$= \frac{GZ_f}{\cos^{1.3}\theta_f}$

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

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

θ_f = the 'down-flooding 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 = vessels displacement in tonnes

Notes;

(1) All regularly used openings for access and for ventilation should be considered when determining the downflooding angle. No opening regardless of size which may lead to progressive flooding should be immersed at an angle of heel of less than 40°. Air pipes to tanks can, however, be disregarded.

(2) 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 should be derived without the benefit of the buoyancy of the superstructure.

(3) It might be noted that provided the vessel complies with the requirements of 6.2.7 and is sailed with an angle of heel which is no greater than the' derived angle of heel', it should 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°.

6.2.8. Multi-hull Sailing Vessels

– The intact stability should conform to the following requirements

1) Curves of statical stability in both roll and pitch should be prepared for at least the Loaded Arrival with 10% consumables. The VCG should 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.
2) If naval architecture software is used to obtain a curve of pitch restoring moments, then the trim angle must 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:

GZ in pitch = CG' x cos (trim angle)

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

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.

3) Data should 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:

$$v_W = 1.5\sqrt{\frac{LM_R}{A'_S\, h\cos\phi_R + A_D b}}$$

or

$$v_W = 1.5\sqrt{\frac{LM_P}{A'_S\, h\cos\phi_P + A_D b}}$$

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:

a) angle of maximum pitch restoring moment, or

b) angle at which foredeck is immersed

c) 10° from design trim

A'_S = area of sails set including mast and boom (square metres)

h = height of combined centre of effort of sails and spars above the waterline

ϕ_R = heel angle at maximum roll righting moment (in conjunction with LMR)

ϕ_P = limiting pitch angle used when calculating LMP (in conjunction with LMP)

A_D = plan area of the hulls and deck (square metres)

b = distance from centroid of A_D to the centreline of the leeward hull This data should be accompanied by the note:

In following winds, the tabulated safe wind speed for each sail combination should be reduced by the vessel speed.

4) If the maximum safe wind speed under full fore-and-aft sail is less than 27 knots, it should 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 (m3), 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) should not be included.

5) The maximum safe wind speed with no sails set calculated in accordance with 3 above should exceed 36 knots. For Short range vessels this wind speed should exceed 32 knots.

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

7) The stability information booklet should include information and guidance on:

- the stability hazards to which these craft are vulnerable, including the risk of capsize in roll and/or pitch;
- the importance of complying with the maximum advised apparent wind speed information supplied;
- the need to reduce the tabulated safe wind speeds by the vessel speed in following winds;
- the choice of sails to be set with respect to the prevailing wind strength, relative wind direction, and sea state;

– the precautions to be taken when altering course from a following to a beam wind

8) In vessels required to demonstrate the ability to float after inversion (according to .3 above), an emergency escape hatch should be fitted to each main inhabited watertight compartment such that it is above both upright and inverted waterlines.

6.3. Damage Stability

6.3.1. The requirements that follow are applicable to all vessels, other than those operating as Short range vessels. Whilst Short range vessels are not required to meet the damage stability criteria defined above, ultimate survivability after minor damage or flooding is recommended.

6.3.2. 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.

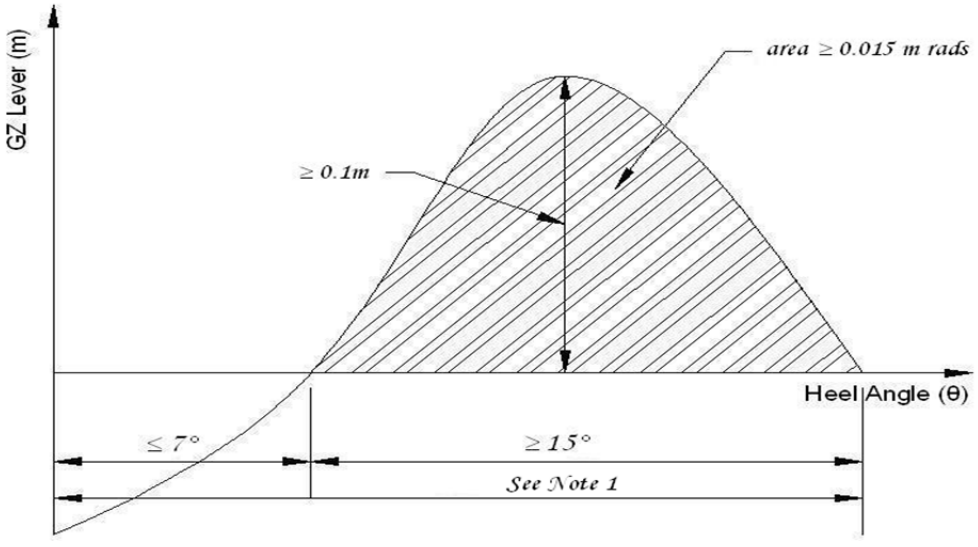
6.3.3. The watertight bulkheads of the vessel should be so arranged that minor hull damage that results in the free flooding of any one compartment, will cause the vessel to float at a waterline which, at any point, is not less than 75mm below the weather deck, freeboard deck, or bulkhead deck if not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

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

6.3.5. Standard permeabilities should be used in this assessment, as follows:

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

6.3.6. In the damaged condition, considered in section 6.3.3 the residual stability should be such that any angle of equilibrium does not exceed 7º from the upright, the resulting righting lever curve has a range to the downflooding angle of at least 15º beyond any angle of equilibrium, the maximum righting lever within that range is not less than 100mm and the area under the curve is not less than 0.015 metre radians.



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 ≥ 0.015m rads. is to be achieved within the positive range of the curve taking into account any restrictions imposed by Note 1.

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

6.4. Elements of Stability

6.4.1. 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.

6.4.2. An inclining experiment should be conducted in accordance with a detailed standard which is approved by the Director General Merchant Shipping and, in the presence of an authorised surveyor.

6.4.3. The report of the inclining experiment and the lightship particulars derived should be approved by the Director General Merchant Shipping prior to its use in stability calculations.

6.4.4. At the discretion of the owner(s)/managing agent(s) and prior to approval of the lightship particulars by the Director General Merchant Shipping, a margin for safety may be applied to the lightship weight and KG calculated after the inclining experiment. Such a margin should be clearly identified and recorded in the stability booklet. A formal record should 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 the margin.

6.4.5. When sister vessels are built at the same shipyard, the Director General Merchant Shipping may accept a lightweight check on subsequent vessels where a detailed weights and centres calculation is carried out and the results do not indicate an adverse effect on the vessels stability, in lieu of a full inclining experiment

6.4.6. The results of the lightship weight check should be within the tolerances specified below;

- For L≤50m 2% of the lightship displacement of the lead ship.
- For L≥160m 1% of the lightship displacement of the lead ship.
- For intermediate length by linear interpolation.
- In addition, the deviation of lightship longitudinal centre of gravity should not exceed 0.5% of the LBP of the lead ship.
- Where the deviation exceeds either of these limits, an inclining test should be carried out

6.5. Stability Documents

6.5.1. All vessels should be provided with a stability information booklet for the Master, that is to be approved by the Director General Merchant Shipping.

6.5.2. A vessel with previously approved stability information which undergoes a major conversion or alterations should be subjected to a complete reassessment of stability and provided with newly approved stability information.

6.5.3. 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). Additionally, unless it can be clearly demonstrated that no major change has occurred, a lightweight check should be carried out at the renewal survey.

Stability

6.5.4. Sailing vessels should 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 wind speed, for the reference of the watchkeeper. This should be a direct copy taken from that contained in the approved stability booklet.

6.5.5. The overall sail area and spar weights and dimensions should 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, must be accompanied by an approved updating of the stability information booklet.

6.5.6. For Short range vessels, 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."

Machinery

7.1.General

7.1.1. The machinery and its installation should, meet with the requirements of one of the IACS Classification Societies. The Class Survey or Notation should include, as a minimum, propulsion and electrical generation machinery and shafting.

7.1.2. 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.

7.1.3. 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 Director General Merchant Shipping..

7.2. On vessels less than 500GT

7.2.1. For existing and new vessels which operate with periodically unattended machinery spaces, the machinery and its installation should meet the standards of SOLAS Chapter II-1/Part E - "Additional requirements for periodically unattended machinery spaces, so far as is reasonable and practicable to do so".

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

7.2.3. Notwithstanding the requirements of section 7.1.1, 7.2.1 and 7.2.2, 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.

7.2.4. Notwithstanding the requirements of section 7.1.1, 7.2.1 and 7.2.2, 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.

7.2.5. Means should be provided to isolate any source of fuel which may feed a fire in an engine space. 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).

7.2.6. 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.

7.2.7. 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. Machinery

7.3. On Vessels of 500GT and over

7.3.1. For existing and new vessels the machinery and its installation should meet the requirements of one of the Classification Societies and of SOLAS Chapters 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.

7.3.2. 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.

Steering Gear Systems

8.1. General

8.1.1. The steering gear and its installation should, meet with the requirements of one of the IACS Classification Societies.

8.2. On Vessels less than 500GT

8.2.1. In the event that the requirements of section 8.1.1 cannot be met on an existing vessel, the Director General Merchant Shipping may be requested to consider and approve alternative arrangements to achieve adequate safety standards.

8.2.2. Vessels should 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 should be power operated in accordance with the requirements of the Director General Merchant Shipping.

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

8.3. On Vessels of 500GT and over

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

8.3.2. 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.

Ship Systems

9.1. Bilge system Requirements

9.1.1. The bilge pumping equipment and its installation should, meet the requirements of one of the IACS Classification Societies. Either the vessel should be in class or a statement of compliance issued by one of the Societies should be provided to the Director General Merchant Shipping.

9.2. Bilge system on Vessels less than 500GT

9.2.1. In the event that the requirements of 9.1.1 cannot be met on an existing vessel, the Director General Merchant Shipping may be requested to consider alternative arrangements to achieve adequate safety standards

9.2.2. All vessels should be provided with at least two fixed and independently powered bilge pumps, with suction pipes so arranged that any compartment can be effectively drained when the vessel is heeled to an angle of 10º.

9.2.3. For Short range vessels, the second pump and suction pipes may be portable.

9.2.4. The location of pumps required by section 9.2.1, their individual power supplies and controls, including those for bilge valves should be such that, in the 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.

9.2.5. Each bilge pump suction line should be fitted with an efficient strum box.

9.2.6. In the case of a vessel where the propulsion machinery space may be unmanned at any time, a bilge level alarm should be fitted. The alarm should 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.

9.2.7. 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, should be kept clear of accommodation spaces and separate from accommodation bilge systems. Bilge level alarms meeting the requirements of section 9.2.6 should be fitted to all such bilges.

9.3. Bilge System on Vessels of 500GT and over

9.3.1. For all vessels, the bilge pumping and its installation should meet the cargo vessel standards of SOLAS Chapter II-1/Part B - Subdivision and stability Regulation 21.

9.3.2. 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.

9.3.3. A minimum of two bilge pumps should be provided. The capacity of the pumps and the size of the bilge main and branches should meet the capacity requirements as required for passenger ships contained in SOLAS as applicable.

9.3.4. In addition the minimum requirements for vessels of less than 500GT contained at section 9.2, should also be met.

Electrical and Control Systems

10.1. General

10.1.1. The electrical and control Systems should meet with the requirements of one of the IACS Classification Societies.

10.2. Electrical Installations on vessels Less than 500GT

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

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

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

10.2.4. An emergency source of lighting should be provided which should be independent of the general lighting system. This source should be sufficient for up to 3 hours duration and should 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, should be sufficient to permit emergency repairs to machinery etc.

10.2.5. Batteries of a type suitable for marine use and not liable to leakage should be used. Areas in which batteries are stowed should be provided with appropriate ventilation to prevent an accumulation of gas which is emitted from batteries of all types.

10.2.6. Emergency power should 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 GPS, echo sounder and AIS. The emergency power supply should be adequate to also supply any electrical emergency equipment fitted, such as fire pumps, bilge pumps, watertight doors, and rescue boat davit.

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

10.3. Electrical Installations on vessels of 500GT and Over

10.3.1. The electrical equipment and its installation should meet the standards of SOLAS Chapter 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.

10.3.2. 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.

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

Life Saving Appliances, Escape, Evacuation and Rescue

11.1. General

11.1.1. Life-Saving Appliances should be provided in accordance with Table 1 - Life- Saving Appliances.

11.1.2. All equipment fitted should be of a type which has been accepted by the Director General Merchant Shipping as complying with IMO Life-Saving Appliances Code and IMO Resolution MSC.81(70).

11.1.3. Additional life-saving equipment which is provided should meet the requirements of 11.1.2.

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

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

11.1.6. Liferaft embarkation arrangements should comply with the following:
- 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 is to be provided. A means for fastening is to be provided and ladders are to be readily available for use at all times.
- 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 are to be provided on each side of the vessel.

11.1.7. Falls for launching devices are to comply with IMO Life-Saving Appliances Code. When falls are of stainless steel, they should 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 Director General Merchant Shipping.

11.1.8. Every inflatable or rigid inflatable rescue boat, inflatable lifejacket, inflatable liferaft and hydrostatic release unit other than a disposable hydro static release unit should be serviced, at intervals not exceeding 12 months unless extended service intervals have been approved by the Director General Merchant Shipping; at a manufacturers approved service station.

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

11.1.10. Maintenance of equipment should be carried out in accordance with the instructions for onboard maintenance.

11.1.11. The stowage and installation of all life-saving appliances is to be to the satisfaction of the Director General Merchant Shipping.

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

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

11.1.14. Means should be provided to prevent overboard discharge of water into survival craft.

Table 1 - LIFE-SAVING APPLIANCES

Area of Operation	4 and 5	0,1, 2 and 3		
Ship Size	≥ 24m and < 500GT[1]	≥ 24m	≥ 500GT	≥ 85m
LIFEBOATS (see 11.2)	-	-	-	YES
LIFERAFTS (see 11.3)	YES	YES	YES	YES
MANOVERBOARD RECOVERY SYSTEM (see 11.6.8)	YES	-	-	-
RESCUE BOAT (see 11.4, 11.5 and 11.6)	-	YES	YES	YES
LIFEJACKETS (see 11.7)	YES	YES	YES	YES
IMMERSION SUITS (see 11.9)	-	YES*	YES*	YES*
LIFEBUOYS (TOTAL)	4	4	8	8
LIFEBUOYS WITH LIGHT (see 11.9.1) AND SMOKE	2	2	2	2
LIFEBUOYS WITH LIGHT	-	-	2	2
LIFEBUOYS WITH BUOYANT (see 11.9.2) LIFELINE	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 VHF RADIO TELEPHONE SETS	2	2	2	3
EPIRB (see 11.10)	-	1	1	1
SART (see 11.11)	-	1	2	2
GENERAL ALARM (see 11.12)	YES	YES	YES	YES
LIGHTING (see11.13)	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 (see 11.14) RESCUE POSTER - SOLAS No 1 IN WHEELHOUSE	YES	YES	YES	YES

* Only required on vessels on Area Category 0

11.2. Lifeboats (Required for vessels over 85m in length)

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

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

11.2.3. 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 2 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.

11.2.4. A lifeboat will also be acceptable as a rescue boat provided it also meets the requirements of the IMO Life-Saving Appliances Code as a rescue boat.

11.3. Liferafts

11.3.1. The liferafts carried are to be stowed in GRP containers and must contain the necessary "emergency pack". For ships less than 500GT operating in area categories 3, 4 and 5, liferafts provided may be equipped with a "SOLAS B PACK". For all other vessels, liferafts should be equipped with a "SOLAS A PACK".

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

11.3.3. For vessels of less than 85m in length, or those complying with 11.2.3, a sufficient number of liferafts should 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:-

Liferafts of 6 - 15 persons capacity to be carried by 2 persons
Liferafts of more than 15 persons capacity to be carried by 4 persons.

11.3.4. When lifeboats are provided in accordance with 11.2.2, 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 11.3.3.

11.3.5. 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.

11.3.6. Liferafts may form part of an approved Marine Evacuation System (MES). A sufficient number of systems should be provided, such that in the event of any one entire system being lost or rendered unserviceable, sufficient aggregate capacity remains on either side of the vessel for all persons on board.

11.3.7. 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.

11.4. Rescue Boats and Recovery of Persons from the Sea – General Requirements

11.4.1. Means should be provided for the recovery of a person from the sea to the vessel and it should 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 should extend from the weather deck to at least 600mm below the lowest operational waterline.

11.4.2. All rescue boats covered within this section are to be equipped to the requirements of the IMO Lifesaving Appliance Code Ch V/5.1.2. Additionally, rescue boats need not be capable of being launched from both sides, and means to lower the boat from within the boat is not required.

11.4.3. Launching stations should 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.

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

11.5. Rescue Boats and Recovery of Persons from the Sea – Vessels of 500GT and over

11.5.1. All vessels of 500GT and over should be provided with a rescue boat meeting SOLAS requirements in all respects, except for the colour where white will also be considered acceptable.

11.5.2. The launching appliances should comply and be approved in accordance with the IMO Lifesaving Appliance Code except that when a power operated crane is fitted, it should 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 should be considered in respect of damaged waterlines and fire.

11.6. Rescue Boats and Recovery of Persons from the Sea – Vessels under 500GT

11.6.1. Vessels under 500GT operating in area categories 0,1, 2 and 3 should be provided with a rescue boat either meeting the requirements of 11.5 or the following:

11.6.2. A boat which is not SOLAS approved but which is suitable for rescue purposes. The boat may be rigid, rigid inflated, or inflated, and should have a capacity for not less than 4 persons, one of which should be assumed to be lying down. Tubes of rigid inflatable or inflatable boats should have a minimum of 3 buoyancy compartments. The boat is to 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.

11.6.3. Launching appliances should be either of an approved type or comply with the following requirements:

11.6.4. The appliance should be able to launch the boat within 5 minutes. When a power operated device is fitted, it should 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 should be considered in respect of damaged waterlines and fire.

11.6.5. The launching appliance and its attachments should 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 should also be tested dynamically to 1.1 times the working load. It should be noted that there is no requirement to recover the rescue boat provided that the casualty and the boat's crew can be recovered on board from the boat in the water.

11.6.6. The design of the falls and winch system should take account of the principles of IMO Lifesaving Appliances Code Ch VI/6.1.2

11.6.7. Where it is proposed to use the running rigging on sailing vessels, the above requirements should also be met.

11.6.8. Short range vessels should either comply with requirements of section 11.5 or sections 11.6.1 to 11.6.7, or the following:

- The vessel should 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 should 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.

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

11.7. Lifejackets

11.7.1. One adult SOLAS approved lifejacket should 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 should be fitted with a light and whistle.

11.7.2. 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 mm, a sufficient number of suitable accessories as may be required to provide a lifejacket for each such person should be available on board to allow them to be secured to such persons.

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

11.7.4. One SOLAS approved child lifejacket or infant lifejacket should be provided for each child or infant onboard.

11.8. Immersion Suits

11.8.1. On vessels operating in area category 0 one approved immersion suit should be provided for each person onboard, these may be of the non-insulated type and compatible with the life jackets provided.

11.8.2. Due consideration should be given to the provision of appropriate immersion/ thermal protection for children and infants carried on board.

11.8.3. When operation in area category o and in cold water areas, the insulated type should be carried. Reference to Resolution IMO MSC Circular 1046 should be made for assessment of thermal protection.

11.8.4. Two TPAs per life boat need to be provided for the use of injured persons

11.8.5. The requirement for immersion suits and thermal protection aids does not apply if the vessels operation is limited to the tropical zone

11.9. Lifebuoys

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

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

11.9.3. Each lifebuoy should be marked with the vessel's name and Port of Registry.

11.10. EPIRB

11.10.1. On all ships operating in area categories 0,1, 2 and 3, an approved EPIRB should 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.

11.10.2. On ships operating only in area categories 4 and 5 it is recommended that an approved EPIRB should 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

11.10.3. All EPIRBs should be registered. EPIRBS are to be tested annually and serviced at not more than five yearly intervals by an approved shore based maintainer.

11.11. Radar Transponders (SART)

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

11.11.2. A SART is not required if the EPIRB provided has a 121.5 MHz frequency transmitting capability

11.12. General Alarm

11.12.1. 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.

11.12.2. For a vessel of 500GT and above the requirement of 11.12.1 is to be supplemented by an electrically operated bell or Klaxon system, which is to be powered from the vessel's main supply and also the emergency source of power.

11.12.3. For a vessel of 85m in length, in addition to the requirements of 11.12.2, a public address system or other suitable means of communication should be provided.

11.13. Lighting

11.13.1. Alleyways, internal and external stairways, and exits giving access to, and including, the muster and embarkation stations should be adequately lit.

11.13.2. Adequate lighting is to 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 should be supplied from the emergency source of power.

11.14. Life-saving Signals and Rescue Poster

11.14.1. 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.

Fire Protection, Fire Safety Appliances and Systems

12.1. General

12.1.1. Terms used in this section should have the same meaning as defined in SOLAS, except as defined in this Section and as follows:

"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.

12.1.2. The table below 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.

Area of Operation	4 and 5	0, 1, 2 and 3	All
Ship Size	Ships < 500GT	Ships < 500GT	Ships ≥ 500GT
Passive fire protection Category 'A' machinery spaces	B-15	A-30	See Tables 1 and 2
Galleys: (see 12.2, 12.3 and 12.4).	B-15	See Tables 1 and 2	See Tables 1 and 2
Form of construction (see 12.2, 12.3, 12.4)			Steel or equivalent, or alternative forms of construction may be accepted subject to requirements.
Means of escape (see 12.16, 12.17 and 12.18):	Two (2).	Two (2).	Two (2).
Fixed fire detection system (see12.14 and 12.15).	Fitted in machinery spaces, service spaces, control stations and accommodation spaces.		Fitted in machinery spaces, service spaces, control stations and accommodation spaces
Automatic sprinkler system or equivalent (see12.14 and 12.15)	Fitted on yachts that do not meet restrictions on combustible materials		Fitted in all vessels
Fire extinguishing arrangements in Category 'A' machinery spaces			As per SOLAS II-2/10.5

12.2. Structural Fire Protection – General Requirements

12.2.1. The purpose of this section is to contain a fire in the space of origin. For this purpose, the following functional requirements should be met:

- the ship should be subdivided by thermal and structural boundaries;
- thermal insulation of boundaries should have due regard to the fire risk of the space and adjacent spaces;
- the fire integrity of the divisions should be maintained at openings and penetrations.

12.2.2. 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 the A or B class standard required as specified for the ship type and size

12.2.3. Insulation required by 12.2.2 is to 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 IMO FTP Code. For 'A' Class divisions, the applicable exposure is 60 minutes, and for 'B' Class divisions, the applicable exposure is 30 minutes.

12.2.4. For structures in contact with sea-water, the required insulation should extend to at least 300 mm below the lightest waterline

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

12.2.6. When gaseous fuel is used for domestic purposes, the arrangements for the storage, distribution and utilisation of the fuel should 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.

12.2.7. In particular, open flame gas appliances provided for cooking, heating or any other purposes, should comply with the appropriate provisions of Section 12.13.

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

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

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

12.2.11. 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 should be paid to the IMO Fire Test Procedures Code.

12.2.12. 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 are to be kept to the minimum quantity practicable and their exposed surfaces are to have low flame spread characteristics.

12.3. Structural Fire Protection – vessels less than 500 GT

12.3.1. The structural fire subdivision required could be contained to the engine room , galley and other high fire risk areas

12.3.2. For aluminium alloy structures, the insulation is to 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.

12.3.3. For composite structures, the insulation is to 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 is to be determined in accordance with a recognised international standard.

12.3.4. Insulation need only be applied on the side that is exposed to the greatest fire risk, ie inside the engine room, a division between two such spaces should however be insulated on both sides unless it is a steel division.

12.3.5. Special attention is to be given to the fixing of fire door frames in bulkheads constructed of materials other than steel. Measures are to 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.

12.3.6. Machinery spaces of category 'A', are to be enclosed by 'A-30' Class boundaries. On vessels operating in area categories 3,4, and 5, such machinery spaces may be enclosed by 'B-15' Class boundaries;

12.3.7. Galleys are to be enclosed by 'B-15' Boundaries.

12.3.8. Openings in 'A' and 'B' Class divisions are to be provided with permanently attached means of closing that are to be at least as effective for resisting fires as the divisions in which they are fitted. Generally, windows should not be fitted in machinery space boundaries.

12.3.9. 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 are to be made to ensure that the fire resistance is not impaired.

12.3.10. 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 are to be made to ensure that the fire resistance is not impaired.

12.3.11. Where the structure or 'A' Class divisions are required to be insulated, it is to 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 are to be made to prevent this heat transmission by insulating the horizontal and vertical boundaries or penetrations for a distance of 450 mm.

12.4. Structural Fire Protection – vessels more than or equal to 500 GT

12.4.1. The hull, superstructures, structural bulkheads, decks and deckhouses should in general be constructed of steel or other equivalent material.

12.4.2. However, in cases where any part of the structure is of aluminium alloy, the following should apply:

1) Insulation of aluminium alloy components of "A" or "B" class divisions, except structure which, in the opinion of the Director General Merchant Shipping, is non-load- bearing, should be such that the temperature of the structural core does not rise more than 200ºC above the ambient temperature at any time during the applicable fire exposure to the standard fire test. This insulation is to be applied on all sides except for the upper sides of decks and the outside of the vessel.
2) Special attention should 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:
   (a) supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in 1) above should apply at the end of one hour; and
   (b) supporting "B" class divisions, the temperature rise limitation specified in 1) above should 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) should be insulated with 25mm of mineral wool approved for use in A class divisions or with an equivalent insulation acceptable to the Director General Merchant Shipping.

12.4.3. For composite structures, the insulation is to 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 is to be determined in accordance with the requirements

of a recognised international standard. This insulation is to be applied on all sides except for the upper sides of decks and the outside of the vessel.

1) Special attention should 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:
   (a) supporting lifeboat and liferaft areas and "A" class divisions, the temperature rise limitation specified in .1 above should apply at the end of one hour; and
   (b) supporting "B" class divisions, the temperature rise limitation specified in .1 above should apply at the end of half an hour.
2) Special attention should be given to the fixing of fire door frames in bulkheads constructed of materials other than steel. Measures are to 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.

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

12.4.5. Main Vertical Zones and Horizontal Zones should be such that;

1) Hull, superstructure and deckhouses in way of accommodation and service spaces should be subdivided into main vertical zones by "A" class divisions. These divisions should have insulation values in accordance with tables 1 and 2.
2) As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck should 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 m 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 m2 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.
3) Such bulkheads should extend from deck to deck and to the shell or other boundaries.
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 should be insulated in accordance with the fire insulation and integrity values given in tables 1 and 2.

12.4.6. Bulkheads Within a Main Vertical Zone should be such that;

1) All bulkheads within accommodation and service spaces which are not required to be "A" class divisions should be at least "B" class or "C" class divisions as prescribed in the tables1 and 2.
2) All such divisions may be faced with combustible materials
3) All corridor bulkheads, where not required to be "A" class should be "B" class divisions which should extend from deck to deck except:
   (a) 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 should be of material which, in thickness and composition, is acceptable in the construction of "B" class divisions but which should be required to meet "B" class integrity standards only in so far as is reasonable and practical in the opinion of the Director General Merchant Shipping;
   (b) 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 should be so constructed and erected to provide a "B" class standard.
   (c) All bulkheads required to be "B" class divisions, except corridor bulkheads, should 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.

12.4.7. Fire Integrity of Bulkheads and Decks; 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 should be as prescribed in tables 1 and 2.

12.4.8. The following requirements should govern application of the tables:

1) Tables 1 and 2 should 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 (a) to (i) below. The title of each category is intended to be typical rather than restrictive.
   (a) Control stations
      - Spaces containing emergency sources of power and lighting.
      - Wheelhouse and chartroom.
      - Spaces containing the vessel's radio equipment.
      - Fire-extinguishing rooms.
      - Fire control rooms and fire-recording stations.
      - Control room for propulsion machinery when located outside the machinery space.
      - Spaces containing centralized fire alarm equipment.
   (b) Corridors and lobbies
      - Guest and crew corridors and lobbies.
   (c) Accommodation spaces
      - Cabins, dining rooms, lounges, offices, pantries containing no cooking appliances (other than equipment such as microwave cookers and toasters), and similar spaces.
   (d) Stairways
      - Interior stairways, lifts and escalators (other than those wholly contained within the machinery space(s)) and enclosures thereto.
      - In this connection, a stairway which is enclosed only at one level should be regarded as part of the space from which it is not separated by a fire door.
   (e) Service spaces (low risk)
      - Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4m , and drying rooms and laundries.
   (f) Machinery spaces of category A,
      - Spaces so defined.
   (g) Other machinery spaces
      - Spaces so defined, excluding machinery spaces of category A.
      - Sprinkler, drencher or fire pump spaces.
   (h) Service spaces (high risk)
      - Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4m_ 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, or lockers storing such fuels storage lockers for gaseous fuels for domestic purposes.
   (i) Open decks
      - Open deck spaces and enclosed promenades having no fire risk. Air spaces (the space outside superstructures and deckhouses).

12.4.9. 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.

12.4.10. 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.

Table 1 - Fire Integrity of Bulkheads Separating Adjacent Spaces

Spaces	Control stations	Corridors and lobbies	Accommodation spaces	Stairways	Service spaces (low risk)	Machinery spaces of category A	Other machinery spaces	Service spaces (high risk)	Open decks
Control stations	A-0_c	A-0	A-60	A-0	A-15	A-60	A-15	A-60	*
Corridors and lobbies		C_d	B-0_d	A-0_a B-0_d	B-0_d	A-60	A-0	A-0	*
Accommodation spaces			C_d	A-0_a B-0_d	B-0_d	A-60	A-0	A-0	*
Stairways				A-0_a B-0_d	A-0_a B-0_d	A-60	A-0	A-0	*
Service spaces (low risk)					C_d	A-60	A-0	A-0	*
Machinery spaces of category A						*	A-0	A-60	*
Other machinery spaces							A-0_b	A-0	*
Service spaces (high risk)								A-0_b	*
Open decks									

Table 2 - Fire Integrity of Decks Separating Adjacent Spaces

Spaces Above / Spaces Below	Control stations	Corridors and lobbies	Accommodation spaces	Stairways	Service spaces (low risk)	Machinery spaces of category A	Other machinery spaces	Service spaces (high risk)	Open decks
Control stations	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	*
Corridors and lobbies	A-0	*	*	A-0	*	A-60	A-0	A-0	*
Accommodation spaces	A-60	A-0	*	A-0	*	A-60	A-0	A-0	*
Stairways	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	*
Service spaces (low risk)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	*
Machinery spaces of category A	A-60	A-60	A-60	A-60	A-60	*	A-60_e	A-60	*

Other machinery spaces	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	*
Service spaces (high risk)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	A-0	*
Open decks	*	*	*	*	*	*	*	*	-

Notes: To be applied to both tables 1 and 2, as appropriate.

[a] For clarification on which applies, see section 12.4.6 and 12.4.11.

[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 (i). 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 12.4.5, "B-O" and "C", where appearing in table 1, should be read as "A-0".

[e] Fire insulation need not be fitted if the machinery space in category (g),in the opinion of the Director General Merchant Shipping, has little or no fire risk.

* 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 12.4.5 an asterisk, where appearing in table 2, except for category (i), should be read as "A-0".

12.4.11. Protection of Stairways and Lifts in Accommodation and Service Spaces should be such that

1) A stairway should be of steel frame construction except where the Director General Merchant Shipping sanctions the use of other equivalent material, and should be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:
   (a) 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
   (b) stairways may be fitted in the open in a public space, provided they lie wholly within such public space.
2) A stairway enclosure should 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 should not give direct access to galleys, machinery spaces, service lockers, or other enclosed spaces containing combustibles in which a fire is likely to originate.
3) A lift trunk should be so fitted to prevent the passage of flame from one 'tween- deck to another and should be provided with means of closing to permit the control of draught and smoke.

12.4.12. Openings in "A" Class Divisions should be such that;

1) Except for hatches between store and baggage spaces, and between such spaces and the weather decks, all openings should be provided with permanently attached means of closing which should be at least as effective for resisting fires as the divisions in which they are fitted.
2) The construction of all doors and door frames in "A" class divisions, with the means of securing them when closed, should provide resistance to fire as well as the passage of smoke and flame, as far as practical, equivalent to that of the bulkheads in which the doors are situated.
   Such doors and door frames should be constructed of steel or other equivalent material. Sliding steel watertight doors need not be insulated.
3) It should be possible for each door to be opened and closed from each side of the bulkhead by one person only.
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, should satisfy the following requirements:
   (a) the doors should be self-closing and be capable of closing with an angle of inclination of up to 3.5° opposing closure;
   (b) the approximate time of closure for hinged fire doors should 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 should be of no more than 0.2 m/s and no less than 0.1 m/s with the ship in the upright position;

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

(d) hold-back hooks not subject to central control station release are prohibited;

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

(f) indication must be provided at the fire door indicator panel in the continuously manned central control station whether each door is closed;

(g) the release mechanism should be so designed that the door will automatically close in the event of disruption of the control system or central power supply;

(h) local power accumulators for power-operated doors should 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;

(i) disruption of the control system or central power supply at one door should not impair the safe functioning of the other doors;

(j) remote-released sliding or power-operated doors should be equipped with an alarm that sounds at least 5s but no more than 10s 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;

(k) a door designed to re-open upon contacting an object in its path should re-open not more than 1m from the point of contact;

(l) double-leaf doors equipped with a latch necessary for their fire integrity should have a latch that is automatically activated by the operation of the doors when released by the system;

(m) the components of the local control system should be accessible for maintenance and adjusting;

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

- the control system should be able to operate the door at the temperature of at least 200°C for at least 60 min, served by the power supply;
- the power supply for all other doors not subject to fire should not be impaired; and
- at temperatures exceeding 200°C the control system should be automatically isolated from the power supply and should be capable of keeping the door closed up to at least 945°C.

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 are to be made to ensure that the fire resistance is not impaired.

12.4.13. Openings in "B" Class Divisions should be such that;

1) Doors and door frames in "B" class divisions and means of securing them should provide a method of closure which should have resistance to fire as far as practical equivalent to that of the divisions except that a ventilation opening 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) should not exceed 0.05m . When such an opening is cut in a door it should be fitted with a grill made of non- combustible material. Doors should be noncombustible or of substantial construction.

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 are to be made to ensure that the fire resistance is not impaired.

12.4.14. Windows and Portlights (Also see section 4.7 and 4.8)

1) All windows and portlights in bulkheads within accommodation spaces, service spaces and control stations should be so constructed to preserve the integrity requirements of the type of bulkheads in which they are fitted.
2) Glass is not to be installed as an interior main vertical zone, stairway enclosure bulkhead, or within machinery space boundaries.

12.4.15. Details of Construction should be such that
1) In accommodation and service spaces, control stations, corridors and stairways:
(a) air spaces enclosed behind ceilings, panelling or linings should be suitably divided by close-fitting draught stops not more than 14m apart; and
(b) in the vertical direction, enclosed air spaces, including those behind linings of stairways, trunks, etc should be closed at each deck.
2) The draught stops are to 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.
3) Without impairing the efficiency of the fire protection, the construction of ceilings and bulkheads should 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.

12.5. Use of Combustible Materials

12.5.1. Except in spaces protected by an automatic sprinkler system and fully addressable fire detection system, all linings, grounds, and ceilings should be of non-combustible materials.

12.5.2. Insulation materials should 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 need not be non-combustible, but they should be kept to the minimum quantity practicable and their exposed surfaces should have low flame spread characteristics.

12.5.3. The following surfaces should be low flame spread:
1) exposed surfaces in corridors and stairway enclosures, and of bulkheads, wall and ceiling linings in all service spaces and control stations; and
2) concealed or inaccessible spaces in accommodation, service spaces and control stations.
As an alternative to 1 and. above, these spaces may contain surfaces that are not low flame spread, provided
3) adequate barriers of low flame spread surfaces are arranged to restrict the spread of flame areas at distances not greater than 5m; or
4) these spaces are protected by an automatic sprinkler system and fully addressable fire detection system

12.5.4. Upholstery composites (fabric in association with any backing or padding material) used throughout the vessel including open decks should be approved in accordance with the IMO FTP Code, Annex 1, Part 8, or equivalent. This does not apply to spaces fitted with sprinklers or equivalent fixed fire extinguishing systems.

12.5.5. Except when a fully addressable fire detection system is fitted and the space is protected by an automatic sprinkler system bedding components should be approved in accordance with the IMO FTP Code, Annex 1, Part 9 or an equivalent standard acceptable to the Director General Merchant Shipping

12.5.6. Upholstery, bedding components and suspended textiles required to comply with the IMO FTP code or an equivalent standard are to be clearly labelled by the manufacturer stating the standard that they meet and any washing or cleaning instructions needed to maintain their fire resistance. These labels are not to be removed

12.5.7. Organic foams used in upholstered furniture and mattresses should be of the combustion modified type.

12.5.8. Except when a fully addressable fire detection system is fitted and the space is protected by an automatic sprinkler system, suspended textile materials such as curtains and drapes should be approved in accordance

with the IMO FTP Code, Annex 1, Part 7, or an equivalent standard, acceptable to the Director General Merchant Shipping.

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

12.5.10. Primary deck coverings within accommodation spaces, service spaces and control stations are to be of a type which will not readily ignite, or give rise to toxic or explosive hazards at elevated temperatures. Reference is also to be made to the IMO FTP Code, Annex 1, Parts 2 and 6.

12.6. Fire Safety of Fuel Systems – General Requirements

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

12.6.2. As far as practicable, oil fuel tanks are to be part of the vessel's structure and are to be located outside Category 'A' machinery spaces.

12.6.3. Except for vessels constructed of materials other than steel, where steel tanks should be provided, the use of free standing oil fuel tanks is prohibited.

12.6.4. 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.

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

12.6.6. 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, should 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.

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

12.6.8. Fuel filter bowls should be of metal construction.

12.6.9. Arrangements for the storage, distribution and utilisation of oil used in pressure lubrication systems are to be such as to minimise the risk of fire or explosion.

12.6.10. 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 are to be such as to minimise the risk of fire or explosion.

12.7. Fire Safety of Fuel Systems – vessels more than or equal to 500 GT

12.7.1. 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 is to 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 is to 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.

12.8. Protection of spaces containing vehicles or craft with fuel in their tanks or lockers storing such fuels

12.8.1. Special consideration should 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 water craft, motor cars and helicopters) which may be transported. This is not considered applicable to diesel stowage.

12.8.2. The quantity of petrol and/or other highly flammable liquids carried should be kept to a minimum, generally up to 150 litres maximum. Greater quantities may be specially considered by the Director General Merchant Shipping on receipt of a reasoned case made by the master.

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

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

- Natural ventilation openings top and bottom.
- Drainage leading overboard.
- Means of securing the fuel containers.
- A facility to boundary cool the locker.

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

1) A manual water spray system giving a coverage of 3.5 ltr/m2/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 should be made for drainage of water introduced to the space. This should 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 Chapter II-2/Part A / Fire Safety Systems Code Chapter IX. The system within the space should also comply with 12.8.5.5)
3) Ducted mechanical exhaust ventilation, which is isolated from other ventilated spaces, should provide at least 6 air changes per hour (based on the empty space) and for which reduction of the airflow should be signalled by an audible and visual alarm on the navigating bridge and at the "in port" control station(s). Exhaust ducting should be arranged to extract from the area low over the bilge. If the fan motors are located in the space or in the ventilation duct they should be certified safe to the correct designation for the flammable vapour/liquid. The ventilation fans should be of a non-sparking type and the ventilation system should be capable of rapid shut down and effective closure in event of fire.
4) A suitable gas detection system is to be provided, 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 450mm above the deck should be certified safe for petrol vapours.
6) Electrical equipment located higher than 450mm above the deck should either;-
   (a) be to [IP55] standard of construction (IEC Publication 529 - Classification of Degree of protection Provided by Enclosures); or

(b) provided with easily accessible means of isolation (on all poles) located outside the space. These isolators should be grouped together as far as practicable and be clearly marked. This option should 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 should be certified safe for the flammable vapours:
   (a) gas detection system
   (b) bilge alarm
   (c) fire detection system
   (d) at least one light fitting (on a dedicated circuit, possibly emergency)

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

12.9. Miscellaneous

12.9.1. Construction and Arrangement of Saunas should be such that;

1) All boundaries of the sauna should be of "A" class divisions, and may include changing rooms, showers and toilets. The sauna should be insulated to A-60 for vessels of 500GT and over, A-30 for vessels under 500GT, and B-15 for ships under 500 GT operating in area categories 3,4 and 5, against other spaces except those inside of the perimeter.
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.
3) Wooden linings on bulkheads and ceilings are permitted. The ceiling above the oven should be lined with a non-combustible plate with an air gap of at least 30mm. The distance from the hot surfaces to combustible materials should be at least 500mm or the combustible materials should be protected (e.g. non- combustible plate with an air gap of at least 30mm).
4) Wooden benches are permitted.
5) The sauna door should open outwards by pushing.
6) Electrically heated ovens should be provided with a timer.
7) All spaces within the perimeter of the sauna are to be protected by a fire detection and alarm system and an automatic sprinkler system.

12.9.2. Construction and Arrangement of Steam Room should be such that;

1) The perimeter of the steam room may include changing rooms, showers and toilets.
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.
3) If a steam generator of more than 5 kW is contained within the perimeter, the suite boundary should be constructed to an A-0 standard, or B-0 for Short range vessels. If a steam generator of more than 5 kW is not contained within the perimeter the steam generator should be protected by A-0 standard divisions, or B-0 for Short range vessels and pipes leading to the discharge nozzles should be lagged.
4) If a suite arrangement contains a sauna then the requirements contained in 12.9.1 are applicable, regardless of the steam generator location.
5) All spaces within the perimeter are to be protected by a fire detection and alarm system.

12.9.3. Deep Fat Frying Equipment

1) Attention is drawn to the requirements in SOLAS II-2/10.6.4 for fire extinguishing systems for deep fat cooking equipment.
2) For fryers of up to 15 litres cooking oil capacity, the provision of a suitably sized Class F extinguisher (BS7937:2000) together with manual isolation of the electrical power supply is acceptable.

12.10. Fire Control Plan(s)

12.10.1. A fire control (general arrangement) plan(s) should be permanently exhibited for the guidance of the Master and crew of the vessel. The content of the plan(s) should adequately show and describe the principal fire prevention and protection equipment and materials. As far as practical, symbols used on the plans should comply with a recognised international standard. The fire control plan may be a combined Fire & Safety Plan, which should show the positions of stowage of the life-saving and fire appliances.

12.10.2. For each deck, the plan(s) should 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 12.8.); 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 should be closed down in a fire emergency.

12.10.3. The plan(s) required should be kept up to date. Up-dating alterations should be applied to all copies of the plan(s) without delay. Each plan should include a list of alterations and the date on which each alteration was applied.

12.10.4. A duplicate set of the plan(s) should 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.

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

12.11. Ventilation Systems - vessels less than 500 GT

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

12.11.2. 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 should be constructed of steel at least 3mm thick or equivalent to the satisfaction of the Director General Merchant Shipping. The ducting within the accommodation should be fitted with:

- fire insulation to A-30 (B-15 on vessels operating in area categories 3, 4 and 5) standard to a point at least 5 metres from the boundary of the machinery space or galley; and
- 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
- fixed means for extinguishing a fire within the galley exhaust duct.

12.11.3. 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.

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

12.11.5. Ventilation systems serving Category 'A' machinery spaces are to be independent of systems serving other spaces.

12.11.6. All enclosed spaces containing free standing fuel tanks are to be ventilated independently of systems serving other spaces.

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

12.11.8. Ducts provided for tumble driers are to be fitted with suitably located cleaning and inspection openings.

12.12. Ventilation Systems - vessels more than or equal to 500 GT

12.12.1. Ventilation ducts should be of non-combustible material. Short ducts, however, not generally exceeding 2m in length and with a cross-section not exceeding 0.02m2 need not be non-combustible, subject to the following conditions:

- they should be of a suitable material having regard to the risk of fire;
- they should be used only at the end of the ventilation device; and
- They should not be situated less than 600mm, measured along the duct, from an opening in an "A" or "B" class division including continuous "B" class ceilings.

12.12.2. Where ventilation ducts with a free cross-sectional area exceeding 0.02m2 pass through class "A" bulkheads or decks, the opening should be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and the ducts and sleeves should comply in this part with the following:

- Sleeves should have a thickness of at least 3mm and a length of at least 900mm. When passing through bulkheads, this length should be divided preferably into 450mm on each side of the bulkhead. The ducts, or sleeves lining such ducts, should be provided with fire insulation. The insulation should have at least the same fire integrity as the bulkhead or deck through which the duct passes.
- Ducts with a free cross-sectional area exceeding 0.075m2 should be fitted with fire dampers in addition to the requirements of .1 above. The fire damper should operate automatically but should also be capable of being closed manually from both sides of the bulkhead or deck. The damper should be provided with an indicator which shows whether the damper is open or closed.
- 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 pierce.

12.12.3. Ducts provided for the ventilation of a machinery space of category A, galleys lies, spaces containing vehicles or craft with fuel in their tanks or lockers storing such fuel, should not pass through accommodation spaces, service spaces or control stations unless they comply with the conditions specified in 1 to 4 or 5 and 6 below:

1) they are constructed of steel having a thickness of at least 3mm and 5mm for duct widths or diameters of up to and including 300mm and 760mm and over respectively and, in the case of ducts with widths or diameters between 300mm and 760mm, thickness should be obtained by interpolation;
2) they are suitably supported and stiffened;
3) they are fitted with automatic fire dampers close to the boundaries penetrated; and
4) they are insulated to "A-60" standard from a machinery space or galley to a point at least 5m beyond each fire damper; or
5) they are constructed of steel in accordance with .1 and .2 above; and
6) they are insulated to "A-60" standard throughout accommodation spaces, service spaces or control stations; except that penetrations of main zone divisions should also comply with the requirements of 12.12.8.

12.12.4. Ducts provided for ventilation to accommodation spaces, service spaces or control stations, should not pass through a machinery space of category A, galley, spaces containing vehicles or craft with fuel in their tanks or lockers storing such fuel, unless they comply with the conditions specified in 1 to 3 or 4 and 5 below:

1) where they pass through a machinery space of category A or galley, ducts are constructed of steel in accordance with 12.12.1
2) automatic fire dampers are fitted close to the boundaries penetrated; and
3) the integrity of the machinery space or galley boundaries is maintained at penetrations or;
4) where they pass through a machinery space of category A or galley, ducts are constructed of steel in accordance with 12.12.1 and
5) within a machinery space of category A or galley, ducts are insulated to "A-60" standard; except that penetrations of main zone divisions should also comply with the requirements of 12.12.8.

12.12.5. Ventilation ducts with a free cross-sectional area exceeding 0.02m2 passing through "B" class bulkheads should be lined with steel sheet sleeves of 900mm in length divided preferably into 450mm on each side of the bulkheads, unless the duct is of steel for this length.

12.12.6. For a control station outside machinery spaces and other normally manned control stations, practical measures should 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 should be provided; air inlets of the two sources of supply should 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.

12.12.7. Exhaust duct(s) from a galley range should be constructed of "A" class divisions where passing through accommodation spaces and/or spaces containing combustible materials. In addition to the requirements of 12.12.3 an exhaust duct should be fitted with:

- a grease trap readily removable for cleaning;
- 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);
- arrangements for shutting off the exhaust fans;
- fixed means for extinguishing a fire within the duct;
- local controls to activate extinguishing system; stop the fans and close the fire dampers should be grouped in one position immediately outside the main entrance to the galley.

12.12.8. When it is necessary for a ventilation duct to pass through a main vertical zone division, a fail-safe automatic closing fire damper should be fitted adjacent to the division. The damper should also be capable of being manually closed from each side of the division. The operating position should be readily accessible and be marked in red light-reflecting colour. The duct between the division and the damper should be of steel or other equivalent material and, if necessary, insulated to comply with the requirements of SOLAS regulation II-2/9.3.1. The damper should be fitted on at least one side of the division with a visible indicator showing whether the damper is in the open position.

12.12.9. Inlets and outlets of ventilation systems should be capable of being closed from outside the space being ventilated.

12.12.10. Power ventilation of accommodation spaces, service spaces, control stations and machinery spaces should be capable of being stopped from an easily accessible position outside the space being served. This position should 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 should be entirely separate from the means provided for stopping ventilation of other spaces.

12.12.11. Where public spaces span three or more open decks and contain combustibles such as furniture, and other enclosed spaces, the space is to be equipped with a smoke extraction system. The smoke extraction system is to be activated by the smoke detection system required by 12.14 and 12.15 and is to be capable of manual control. The fans are to be capable of exhausting the entire volume within the space in not more than 10 min.

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

12.12.13. Ventilation systems serving Category 'A' machinery spaces are to be independent of systems serving other spaces.

12.12.14. All enclosed spaces containing free standing fuel tanks are to be ventilated independently of systems serving other spaces.

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

12.12.16. 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 0.05m2 .

12.12.17. For spaces containing vehicles or craft with fuel in their tanks or lockers storing such fuels, see 12.8. For additional requirements for the ventilation of domestic gaseous fuel, see 12.13.

12.12.18. Ducts provided for exhaust ventilation from tumble driers are to be fitted with suitable located cleaning and inspection openings.

12.12.19. All fire dampers should comply with IMO Resolution A.754(18) pt A11 as referenced in IMO FTP Code , Annex 1, Part 3.

12.13. Fire Safety Arrangements for Gaseous Fuel for Domestic Purposes

12.13.1. Where gaseous fuel is used for domestic purposes, the arrangements for the storage, distribution and utilisation of the fuel is to 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 is preserved. The installation is to be in accordance with recognised National or International Standards. Hydrocarbon gas detectors and carbon monoxide detectors should be provided.

12.13.2. Gas cylinders, regulators and safety devices should 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.

12.13.3. An open flame gas appliance provided for cooking, heating or any other purpose should comply with the requirements of EC Directive 90/396/EEC or equivalent.

12.13.4. The installation of an open flame gas appliance should comply with the appropriate provisions of Annex 3.

12.14. Fixed Fire Detection and Fire-Alarm Systems – General Requirements

12.14.1. 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.

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

12.14.3. fixed fire detection and fire alarm system installations should be suitable for the nature of the space, fire growth potential and potential generation of smoke and gases;

12.15. Fixed Fire Detection and Fire-Alarm Systems – Vessels more than or equal to 500GT

12.15.1. Each separate zone in all accommodation and service spaces, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., should be provided throughout with an automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the requirements of SOLAS 74, Chapter II-2 Part C, regulation II-2/7 and the IMO FSS Code, Chapter 8, or an equivalent standard acceptable to the Director General Merchant Shipping.

12.15.2. The system should 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 area bounded by "A-O" class bulkheads or the breadth of the vessel squared, whichever is the greater, subject to a maximum of 280m2.

12.16. Means of Escape – General Requirements

12.16.1. 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 should be met:

- safe escape routes should be provided;
- escape routes should be maintained in a safe condition, clear of obstacles; and
- additional aids for escape should be provided as necessary to ensure accessibility, clear marking, and adequate design for emergency situations.

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

12.16.3. Lifts should not be considered as forming one of the required means of escape.

12.16.4. Adequate deck area is to be provided at assembly stations and embarkation areas having due regard to the expected number of persons. Generally, assembly stations should be provided close to the embarkation stations. Each assembly station should have sufficient clear deck space to accommodate all persons assigned to assemble at that station, but at least 0.35m2 per person

12.17. Means of Escape – Vessels under 500GT Requirements

12.17.1. The arrangement of the vessel should 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 should be provided. Concealed escapes and escape routes are to be clearly marked to ensure ready exit.

12.17.2. Category 'A' machinery spaces on motor vessels should also be provided with a minimum of two means of escape. Other machinery spaces should 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.

12.17.3. The normal means of access to the accommodation and service spaces below the open deck is to 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.

12.17.4. Where accommodation arrangements are such that access to compartments is through another compartment, the second escape route is to 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.

12.17.5. 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.

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

12.17.7. All doors in escape routes are to 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 are to be non removable. Where doors are lockable measures to ensure access from outside the space are to be provided for rescue purposes.

12.18. Means of Escape – Vessels more than or equal to 500GT

12.18.1. Stairways and ladders should 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 should be complied with:

1) Below the bulkhead deck two means of escape, at least one of which should be independent of watertight doors, should 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 are to 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 will provide continuous fire shelter from the level of its origin to the appropriate survival craft embarkation deck
3) Within each main vertical zone there should 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 should be satisfactory for the number of persons likely to use them.
4) Access from the stairway enclosures to the lifeboat and liferaft embarkation areas should avoid high fire risk areas.
5) Stairways serving only a space and a balcony in that space should 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 should be provided, one of which may be a window of sufficient size or another means.
7) Stairways are not to exceed 3.5m 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 ready accessible escape which will 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 should be provided either directly or through protected internal routes which have fire integrity and insulation values for stairway enclosures as determined by tables 1 and 2, 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 is to have two means of escape, one of which is to give access to a readily accessible escape which will provide continuous fire shelter from the level of its origin to the appropriate survival craft embarkation deck.

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

1) The two means of escape should consist of either:
   (a) 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 should provide continuous fire shelter from the lower part of the space to a safe position outside the space. This shelter is to 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 is to be provided with a steel or equivalent material self-closing door; or
   (b) 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 14B.2.12.2.1 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 should 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.

12.18.3. 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.

12.19. Emergency Escape Breathing Devices

12.19.1. All vessels over 500GT should carry at least two EEBD's within accommodation spaces, and at least two EEBD's should be carried in each main vertical zone

12.19.2. Emergency escape breathing devices (EEBD's) should comply with the Fire Safety Systems Code. At least one spare emergency escape breathing device should be kept onboard.

12.19.3. On all vessels over 500GT, within the machinery spaces, EEBD's should 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 should 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 should be indicated in the fire control plan.

12.20. Public Address System

12.20.1. For vessels having a length of 85 m or more, a public address system complying with the requirements of SOLAS 74. Chapter III, regulation 6.5 is to be available throughout the accommodation and service spaces and control stations and open decks.

12.21. Fire Appliances - Vessels of Less Than 500gt

12.21.1. Fire appliances are to be of an approved type and should be provided to meet the minimum requirements below and listed in Table 1 and the specific requirements that follow.

12.21.2. Fire appliances provided in addition to those required by 15A.1.1 should be of a type acceptable to the Director General Merchant Shipping.

12.21.3. The location of concealed fire appliances should be clearly marked.

Table 1 - FIRE APPLIANCES - VESSELS OF LESS THAN 500GT

Appliance	Minimum Requirement
PROVISION OF WATER JET – sufficient to reach any part of vessel	1
MAIN POWER DRIVEN FIRE PUMP - engine or independent drive	1
ADDITIONAL INDEPENDENT POWER DRIVEN FIRE PUMP, POWER SOURCE AND SEA CONNECTION - not located in the same space Main pump	1
FIREMAIN & HYDRANTS -	Sufficient to provide a jet of water to any part of the vessel with a single length of hose
HOSES - with jet/spray nozzles each fitted with a shut-off facility	3
FIRE EXTINGUISHERS - portable,(accommodation and service spaces)	For each deck, 1 within 10m of any position within an accommodation or service space
FIRE EXTINGUISHERS - for a machinery space of Category A – Fixed Fire Extinguishing system 1 portable extinguisher for oil fires for each 74.6kw power; or 2 portable extinguishers for oil fires together with either 1 foam extinguisher of 45l capacity; or 1 CO2 extinguisher of 16kg capacity	a fixed fire extinguishing system approved in accordance with the IMO Fire Safety Systems Code; and 7 (max) or 2 + 1
FIREMANS OUTFIT - to include an approved breathing apparatus for each outfit	2
FIRE BLANKET - in galley	1

12.21.4. Provision of Water Jet ; at least one jet of water, from a single length of hose, should 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 or any part of a storage compartment when empty;

12.21.5. Fire Pumps

1) The power driven fire pump should have a capacity of

$$2.5x\{1+0.066x(L(B+D))0.5\}2 \text{ m3/hour}$$

where:

L = the length

B = the greatest moulded breadth

D = the moulded depth measured to the bulkhead deck at amidships.

When discharging at full capacity through 2 adjacent fire hydrants, the pump should be capable of maintaining a water pressure of 0.2N/mm2 at any hydrant, provided the fire hose can be effectively controlled at this pressure.

2) The second fire pump, which may be portable, should have a capacity of at least 80% of that required by for the primary pump and be capable of input to the fire main. A permanent sea connection, external to the machinery space, should be provided. "Throw-over" sea suctions are not acceptable.
3) Each centrifugal fire pump should be provided with a non-return valve in the connection to the fire main.

12.21.6. Fire Main and Hydrants

1) A fire main, water service pipes and fire hydrants should be fitted.
2) The fire main and water service pipe connections to the hydrants should be sized for the maximum discharge rate of the pump(s) connected to the main.
3) The fire main, water service pipes and fire hydrants should be constructed such that they will:
   - not be rendered ineffective by heat;
   - not readily corrode; and
   - be protected against freezing.
4) When a fire main is supplied by 2 pumps, 1 in the machinery space and 1 elsewhere, provision should 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) should be manually operated valves fitted outside the machinery space in a position easily accessible in the event of a fire.
5) The fire main should have no permanent connections other than those necessary for fire fighting or washing down.
6) Fire hydrants should 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.
7) Fire hydrants should be fitted with valves that allow a fire hose to be isolated and removed when a fire pump is operating.

12.21.7. Fire Hoses

1) Fire hoses should not exceed 20 metres in length, and generally, the diameter for use with a powered pump should not be less than 38mm.
2) Fire hoses and associated tools and fittings should 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 should have jet/spray nozzles (incorporating a shut-off facility) of diameter 19mm, 16mm or 12mm depending on fire fighting purposes. For accommodation and service spaces, the diameter of nozzles need not exceed 12mm. For machinery spaces and exterior locations, the nozzle size should be as to obtain the maximum discharge possible from two jets at the pressure referred to in 12.21.5, from the smallest pump.
3) Hydrants or connections in interior locations on the vessel should 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.

4) The number of fire hoses and nozzles provided should correspond to the functional fire safety requirements, but be at least 3.

12.21.8. Portable Fire Extinguishers for Use in Accommodation and Service Spaces

1) The number, location, fire extinguishing medium type and capacity should be selected according to the perceived fire risk, but for each deck, one portable extinguisher should be available for use within a distance of 10m from any location. A minimum of at least 3 portable fire extinguishers should be provided. As far as practical, the fire extinguishers provided should have a uniform method of operation and should be of an approved 5kg/9 litre type and capacity.
2) Portable fire extinguishers of the carbon dioxide type should not be located or provided for use in accommodation spaces.
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 should be located external to, but adjacent to, the entrance of the space(s) in which they will be used. Extinguishers should be stowed in readily accessible and marked locations.
4) Spare charges should 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) should be provided.

12.21.9. Fire Extinguishing in Machinery Spaces

1) In a category A machinery space containing internal combustion type machinery, fire appliances should be provided at least to the extent listed in item 7 of Table 1- Fire Appliances.
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 IMO Fire Safety Systems Code should be installed.
3) Portable fire extinguishers should be installed and the number, location, fire extinguishing medium type and capacity should be selected according to the perceived fire risk in the space. (Spare charges or spare extinguishers should be provided per 12.21.8
4) In any case, portable fire extinguishers for extinguishing oil fires should be fitted:
   - in a boiler room - at least 2;
   - in a space containing any part of an oil fuel installation - at least 2; and
   - in a firing space - at least 1.

12.22. Fire Appliances - Vessels of 500GT and Over

12.22.1. All vessels should comply with the requirements of SOLAS 74, Chapter II-2, regulation 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.

12.22.2. In no case should the standards applied be less than those applied to a vessel of less than 500GT. The location of concealed fire appliances should be clearly marked.

Communications Equipment and Systems

13.1. General

13.1.1. This section applies to all vessels.

13.2. Radio Communications: The Global Maritime Distress and Safety System (GMDSS)

13.2.1. Each vessel should 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 radio communication 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; and
8) transmitting and receiving bridge-to-bridge communications.

13.2.2. Existing vessels should carry sufficient radio equipment for distress and safety communications to the satisfaction of the Director General Merchant Shipping. The radio equipment carried should not be less than that specified in Table 1 of this section.

13.2.3. Notwithstanding the requirements in Table 1 of this section, it is strongly recommended that existing vessels regardless of size should carry the radio equipment according to the area of operation specified in Table 2.

13.3. Radio Installations

13.3.1. Table 1 illustrates the minimum radio installations to be carried by an existing vessel sailing at different distances from a safe haven.

Table 1

Area of operation category	3, 4 & 5	2	1	0	Notes
VHF fixed radio installation[1].	1	1	1	1	An appropriate radio operators' certificate should be carried by any person operating this equipment.
Portable VHF[3]	1	1	1	1	It is recommended that, where practicable, vessels carrying more than one liferaft carry one portable VHF per raft.
MF SSB radio installation with DSC[1].	None	R[2]	1[2]	None	An appropriate GMDSS certificate should be carried by any person operating this equipment.

Communications Equipment and Systems

Inmarsat Ship Earth Station[1] (or an MF/HF transceiver with DSC)[1]	None	None	R	1	An appropriate GMDSS certificate should be carried by any person operating this equipment.
NAVTEX receiver	R	R	1	1	

R = Recommendation only
1 = Number required to be fitted

[1]An appropriate GMDSS certificate should be carried by any person operating this equipment. The MCA can give advice on suitable training courses.
[2]or an Inmarsat Ship Earth Station on the advise of the Merchant Shipping Secretariat
[3] Arrangements should be provided to protect the portable VHF from water damage e.g. waterproof cover

13.4. Example:

13.4.1. As an illustration, the minimum equipment to be installed on an existing vessel operating worldwide would be:

- one VHF radiotelephone with DSC;
- one INMARSAT –C ship earth station;
- one NAVTEX receiver;
- one MF/HF radiotelephone with DSC.

Note: The requirements for the carriage of two way radiotelephone sets, EPIRBs and SARTs are given in chapter 13, table 1. EPIRBs for vessels operating in Sea Area A4 are to be capable of operating through the polar orbiting satellite service in the 406 MHz band.

13.4.2. Table 2 illustrates the minimum radio installations to be carried by new vessels and on vessels subject to major conversion. This fulfils the distress and safety communication functions for voyages in Sea Areas A1, A2, A3 and A4.

Table 2

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	MF/HF (DSC) Radiotelephone[2]	MF/HF (DSC) Radiotelephone[2]
---	---	INMARSAT C Ship Earth Station		

Notes:

1 If the vessel is sailing in an area where an international NAVTEX service is not provided then the NAVTEX receiver should 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.

The requirements for the carriage of two way radiotelephone sets, EPIRBs and SARTs are given in Section 13, Table 1. EPIRBs for vessels operating in Sea Area A4 are to be capable of operating through the polar orbiting satellite service in the 406 MHz band.

13.5. Operational Performance

13.5.1. All radio communication equipment required by this section should be of a type which is approved by the relevant authority.

13.6. Installation

13.6.1. All radio installations should:

1) be so located to ensure the greatest possible degree of safety and operational availability;
2) be protected against the harmful effects 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.

13.7. Sources of Energy

13.7.1. Vessels <300GT should have sufficient reserve energy supply to operate the radio installations for a minimum of 3 hours in addition to the emergency supply.

13.7.2. Vessels ≥300GT but <500GT NOT meeting the emergency source of electrical energy requirements of SOLAS II-1/Part D, Regulation 43, should have sufficient reserve energy supply to operate the radio installations for a minimum of 6 hours in addition to the emergency supply.

13.7.3. All vessels ≥300 GT meeting the emergency requirements of SOLAS II-1/D, Regulation 43 should have a one hour reserve supply.

13.7.4. When a reserve source of energy consists of a rechargeable accumulator battery, a means of automatically charging such batteries should be provided, which is capable of recharging them to minimum capacity requirements within 10 hours which should include a visual and audible charger failure device.

13.7.5. The siting and installation of accumulator batteries should ensure the highest degree of service and safety.

13.8. Watches

13.8.1. A vessel, while at sea, should 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.)

13.9. Radio Personnel

13.9.1. A vessel should carry at least one person qualified for distress and safety radiocommunication purposes, who should hold a certificate of competence acceptable to the relevant authority.

13.10. Availability of Equipment

13.10.1. On vessels of 300GT and above the availability of radio installations should be ensured by using such methods as duplication of equipment, shore-based maintenance or at sea electronic maintenance capability.

13.10.2. Mobile phones or portable VHF should be contained in a waterproof pouch or be waterproof in their own right.

13.10.3. A card(s) giving a clear summary of the distress communications, urgency and safety procedures is to be displayed in full view of the radio operating position or where mobile communications equipment is carried. It should be in a prominent place where it can be easily reached in the event of an emergency.

Navigational Safety, Lights and Equipment

14.1. General

14.1.1. Every vessel should comply with the requirements of the International Regulations For Preventing Collisions At Sea, 1972, as amended.

14.1.2. All navigation lights should be provided with main and emergency power supply.

14.1.3. With due regard to accessibility, the requirement for duplication for navigation lights required to be shown whilst underway may be satisfied by having spare bulbs that can be easily fitted within three minutes. However, on vessels over 500GT there must be duplicate lights.

14.1.4. For vessels where compliance is impracticable, alternatives may be considered by application to the Director General Merchant Shipping.

14.2. Navigational Equipment

14.2.1. A vessel should 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 should be possible to correct the compass for co- efficients B, C and D, and heeling error
3) The magnetic compass or repeater should be so positioned as to be clearly readable by the helmsman at the main steering position. It should also be provided with an electric light, the electric power supply of which should be of the twin wire type.

14.2.2. A vessel should 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) 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.

14.2.3. For vessels of less than 300GT the equipment specified in 14.2.1 and 14.2.2 need not be of an approved type.

14.2.4. Means should be provided for taking bearings as near as practicable over an arc of the horizon of 360º. 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.

14.2.5. For vessels under 300GT the requirements of 14.2.2.4 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.

14.2.6. Attention should 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).

14.2.7. All vessels of 300GT and over should be fitted with an approved automatic identification system (AIS) in accordance with SOLAS Chapter V,. The AIS should:

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.

14.2.8. All vessels of 300GT and over, unless operating solely within sea area A1, should 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 should as a minimum:

1) be capable of automatically, and without human intervention on board 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.

14.2.9. All vessels should be fitted with a bridge navigational watch alarm system (BNWAS), in accordance with SOLAS Chapter V Regulation 19 as follows:

1) Vessels of 150 gross tonnage and upwards constructed on or after 1 July 2011;
2) Vessels of 500 gross tonnage and upwards but less than 3,000 gross tonnage constructed before 1 July 2011, not later than the first survey after 1 July 2013; and
3) Vessels of 150 gross tonnage and upwards but less than 500 gross tonnage constructed before 1 July 2011, not later than the first survey after 1 July 2014.
4) 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 Director General Merchant Shipping.

The bridge navigational watch alarm system should be in operation whenever the ship is underway at sea.

14.2.10. Vessels of 3000 GT and over should comply with the requirements of SOLAS Chapter V Regulation 19.

14.3. Bridge Visibility

14.3.1. Navigation bridge visibility should comply with SOLAS Chapter V. Vessels under 50m in length should comply as far as reasonable and practicable.

14.3.2. Windows may be inclined from the vertical plane provided that, where necessary, appropriate measures are taken to avoid adverse reflections from within.

14.3.3. Windows to the navigating position should not be of either polarised or tinted glass (see 4.8.10) Portable tinted screens may be provided for selected windows.

14.4. Nautical Publications

Navigational Safety, Lights and Equipment

14.4.1. Every vessel should 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.

14.4.2. An approved electronic chart display and information system (ECDIS) may be accepted as meeting these chart carriage requirements.

14.4.3. Back-up arrangements to meet these functional requirements should be provided where this function is partly or fully filled by electronic means: this means single ECDIS and paper charts or duplicate ECDIS. Where duplicate ECDIS is provided as the primary means of navigation, officers with responsibility for navigation watch keeping should have received appropriate shore based and ship type-specific training.

14.5. Miscellaneous Equipment and Requirements

14.5.1. Every vessel should carry a barometer. Every sailing vessel should carry an anemometer and an inclinometer.

14.5.2. Every vessel should 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 14.5.3

14.5.3. Every vessel should carry an efficient fixed or portable searchlight suitable for man-overboard search and rescue operations.

14.5.4. Vessels of <150 GT require a radar reflector.

14.5.5. Vessels of >300 GT must be marked externally with the vessel's IMO number which may be horizontal provided that it is visible from the air.

Anchors and Cables

15.1. General

15.1.1. Vessels will be considered to have adequate equipment if fitted out in accordance with standards for such equipment, set by an approved Classification Society.

15.1.2. Vessels not equipped in accordance with 15.1.1 may be specially considered by the Director General Merchant Shipping, provided full information is submitted for approval.

15.1.3. All vessels are to have at least 2 anchors, one of which must be ready for use at all times. Any powered deployment system should be connected to an emergency power supply or be capable of being manually operated.

15.2. Requirements for Sailing Vessels

15.2.1. The sizing of anchors and cables for sailing vessels should take into account the additional windage effect of the masts and rigging.

15.2.2. Typically, for square rigged sailing vessels, experience-based guidance on approximate increase in anchor mass and cable strength required is:

- for vessels up to 50 metres in length, typically 50% above the requirements for a typical motor vessel having the same total longitudinal profile area of hull and superstructure as the square-rigged sailing vessel under consideration; and
- for vessels 100 metres in length and over, typically 30% above the requirements for a typical motor vessel having the same total longitudinal profile area of hull and superstructure as the square-rigged sailing vessel under consideration.
- For a square-rigged sailing vessel of between 50 and 100 metres in length the increase should be obtained by linear interpolation.

Crew Accommodation Facilities vessels built before 12 January 2018

16.1. General

16.1.1. This section also applies to vessels less than 200GT built after 12 January 2018 that do not trade internationally.

16.1.2. An adequate standard of accommodation should be provided to ensure the comfort, recreation, health and safety of all persons on board, due consideration should also be given to the number of hotel and other support staff required.

16.1.3. 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.

16.1.4. Generally, accommodation standards for the crew should be at least equivalent to the standards set by the International Labour Organization conventions for crew accommodation in merchant ships. The ILO Convention provisions should be practicable with regard to vessels greater than 500GT. For smaller vessels, particularly sailing vessels, the standards should 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 should be agreed with the Director General Merchant Shipping. 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 should not be immersed.

16.1.5. Crew accommodation should not be sited within hazardous spaces.

16.1.6. The standard that follow describe by general principles the requirements which will need to be expanded to meet the requirements which relate to the use and areas of operation of particular vessels.

16.2. Access/Escape Arrangements

16.2.1. Refer to sections 12.16, 12.17 and 12.18 for details.

16.3. Lighting

16.3.1. An electric lighting system should 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 10.

16.4. Heating and Air Conditioning

16.4.1. As considered appropriate, an adequate heating or air conditioning installation should be provided.

16.5. Food Preparation, Storage and Messing

16.5.1. The galley floor should be provided with a non-slip surface and provide a good foothold.

Accommodation Facilities

16.5.2. All furniture and fittings in the galley should be made of a material which is impervious to dirt and moisture. All metal parts of furniture and fittings should be rust resistant.

16.5.3. The ventilation in the galley should 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 16.7).

16.5.4. When a cooking appliance is gimballed it should be protected by a crash bar or other means to prevent personal injury. Means should be provided to lock the gimballing mechanism.

16.5.5. Means should be provided to allow the cook to be secured in position, with both hands free for working, when the vessel motions threaten safe working.

16.5.6. Secure and hygienic storage for food and garbage should be provided.

16.5.7. A messing area(s) should be provided, each messing area should be large enough to accommodate the greatest number of persons likely to use it at any one time.

16.6. Hand Holds and Grab Rails

16.6.1. There should be sufficient hand holds and grab rails within the accommodation to allow safe movement around the accommodation at all times. Stairways should be specially considered

16.7. Ventilation

16.7.1. Effective means of ventilation should be provided to all enclosed spaces which are entered by personnel.

16.7.2. Mechanical ventilation should 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 should 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.

16.7.3. Air conditioning systems are to provide a minimum of 25m3 of air per hour, per person accommodated in the ventilated space during normal operating conditions.

16.7.4. Enclosed galleys are to be specially considered, and where air conditioning is not fitted should have, as a minimum, a mechanical supply of 20 fresh air changes per hour and a mechanical exhaust of 30 changes.

16.8. Water Services

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

16.8.2. In addition, an emergency reserve supply of drinking water should be carried, sufficient to provide at least 2 litres per person. The installation of fresh water making machines and disinfection arrangements are to be to the acceptance of the Director General Merchant Shipping (for this purpose silver ionisation or chlorination would be considered acceptable).

16.9. Sleeping Accommodation

16.9.1. An appropriately sized bed (bunk or cot,) should 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 Director General Merchant Shipping is satisfied that that this is reasonable and will 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, should be provided.

There should 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.

16.9.2. In crew accommodation, wherever possible, the maximum number of persons per sleeping room is to be two and there should be unobstructed access to at least one side of each bed. Any increase in the maximum number of persons per sleeping room should be agreed with the Director General Merchant Shipping

16.10. Toilet Facilities

16.10.1. Adequate sanitary toilet facilities should be provided on board. The facilities should be at least one water closet, one shower for every 8 persons or part thereof, and one washbasin for every 6 persons or part thereof.

16.10.2. In vessels where a sanitary system, including a holding tank, is provided, care should 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.

16.11. Stowage Facilities for Personal Effects

16.11.1. Adequate stowage facilities for clothing and personal effects should be provided for every person on board.

16.12. Securing of Heavy Equipment

16.12.1. All heavy items of equipment such as ballast, batteries, cooking stove, etc, should be securely fastened in place. All stowage lockers containing heavy items should have lids or doors which are capable of being securely fastened.

Crew Accommodation Facilities - vessels less than 200GT built after 12 January 2018

17.1. General

17.1.1. Vessels of less than 200GT that do not trade internationally are excepted from the requirements of this section and should comply with Section 16.

17.1.2. Accommodation should provide decent living conditions and recreational facilities for those persons employed or engaged in any work capacity onboard. Due consideration should be given to likely numbers of hotel and support staff onboard.

17.1.3. In order to provide decent living conditions and recreational facilities the following requirements are provided as minimum standards.

17.1.4. The materials used to construct internal bulkheads, panelling and sheeting, floors and joinings should be suitable for the purpose and conducive to ensuring a healthy environment.

17.1.5. Excessive noise and vibration should 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.

17.2. Access/Escape Arrangements

17.2.1. Refer to sections 12.16 and 12.17 for details.

17.3. Headroom

17.3.1. There should be adequate and reasonable headroom for all seafarers on board taking into consideration the size and operation of vessel. Headroom provided should not result in discomfort to the seafarers onboard.

17.3.2. For spaces where seafarers are expected to stand for prolonged periods, the minimum headroom should be 190 centimetres. The competent authority may allow reduced height in some locations if it does not result in discomfort to seafarers.

17.4. Ventilation

17.4.1. Effective means of ventilation should be provided to all enclosed spaces which are entered by personnel.

17.4.2. Mechanical ventilation should 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 should 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.

17.4.3. 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.

17.4.4. Enclosed galleys are to be specially considered, and where air conditioning is not fitted should have, as a minimum, a mechanical supply of 20 fresh air changes per hour and a mechanical exhaust of 30 changes.

17.4.5. In spaces where sanitary facilities are provided there should be ventilation that draws from the accommodation and extracts to the open air independent of the other parts of the accommodation.

17.5. Heating and Insulation

17.5.1. All accommodation spaces should be provided with, an adequate heating or air conditioning installation taking into account climatic conditions. The accommodation should be adequately insulated.

17.6. Lighting

17.6.1. An electric lighting system should 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 10.

17.6.2. Seafarer's sleeping rooms and mess rooms should 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.

17.7. Water Services and Provision

17.7.1. Hot and cold running fresh water should be available in all wash places.

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

17.7.3. In addition, an emergency reserve supply of drinking water should be carried, sufficient to provide at least 2 litres per person. The installation of fresh water making machines and disinfection arrangements are to be to the acceptance of the Director General Merchant Shipping (for this purpose silver ionisation or chlorination would be considered acceptable).

17.8. Galley Facilities and Provision of Food

17.8.1. Adequate food should be provided for all seafarers onboard free of charge. The provision of food should take account of the seafarers' religious requirements and cultural practices, the nature and duration of the voyage, and should be suitable in respect of quantity, nutritional value, quality and variety.

17.8.2. The organisation and equipment of the catering department should be such as to permit the provision to the seafarers of adequate, varied and nutritious meals prepared and served in hygienic conditions. This should 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 should be provided with a non-slip surface and provide a good foothold.

17.8.3. All furniture and fittings in the galley should be made of a material which is impervious to dirt and moisture. All metal parts of furniture and fittings should be rust resistant.

Accommodation Facilities

17.8.4. The ventilation in the galley should 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 17.4.4).

17.8.5. When a cooking appliance is gimballed it should be protected by a crash bar or other means to prevent personal injury. Means should be provided to lock the gimballing mechanism.

17.8.6. Means should be provided to allow the cook to be secured in position, with both hands free for working, when the vessel motions threaten safe working.

17.8.7. Secure and hygienic storage for food and garbage should be provided.

17.8.8. A messing area(s) should be provided, each messing area should be large enough to accommodate the greatest number of persons likely to use it at any one time.

17.9. Hand Holds and Grab Rails

17.9.1. There should be sufficient hand holds and grab rails within the accommodation to allow safe movement around the accommodation at all times. Stairways should be specially considered.

17.10. Sleeping Accommodation

17.10.1. Sleeping accommodation should be of adequate size and properly equipped so as to ensure reasonable comfort and to facilitate tidiness.

17.10.2. There should be no direct access into sleeping rooms from spaces for machinery, galleys, storerooms, drying rooms, or communal sanitary areas.

17.10.3. In seafarer accommodation, wherever possible, the maximum number of persons per sleeping room is to be two and there should be unobstructed access to at least one side of each bed. Any increase in the maximum number of persons per sleeping room should be agreed with the Director General Merchant Shipping.

17.10.4. Sleeping accommodation should be situated or equipped, as practicable, so as to provide appropriate levels of privacy for men and for women.

17.10.5. Berths for seafarers must 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 will 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.

17.10.6. Where considered appropriate, means for preventing the occupants from falling out, should be provided.

17.10.7. Sleeping rooms should 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.

17.10.8. 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 17.10.7, there should 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.

17.11. Sanitary Facilities

17.11.1. There must 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 should include one shower or one tub, one wash basin and one toilet. Each set of sanitary facilities must be provided with a door that is lockable. Where reasonable and practicable there should be separate sanitary facilities provided for men and for women.

17.11.2. In vessels where a sanitary system, including a holding tank, is provided, care should 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.

17.12. Mess Rooms

17.12.1. Mess rooms should 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 will be a shared facility for seafarers and passengers; this should be subject to agreement by the Director General Merchant Shipping.

17.13. Recreational Facilities

17.13.1. Appropriate seafarers' recreational facilities, amenities and services, as adapted to meet the special needs of seafarers who must live and work onboard, should be provided.

17.13.2. All vessels should 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 onboard, and are protected from the elements. Due consideration should 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.

17.14. Stowage Facilities for Personal Effects

17.14.1. Each seafarer should be provided with adequate storage space for personal effects which must be a minimum of 125 litres per seafarer.

17.15. Machinery Space Boundaries

17.15.1. Where machinery spaces are adjacent to accommodation spaces, the boundaries should be designed to be gas tight.. The requirement to be gas-tight is taken to mean that bulkheads should 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.

17.15.2. Machinery space boundaries must retain any liquids which may leak from the equipment within the machinery space.

17.16. Securing of Heavy Equipment

17.16.1. All heavy items of equipment such as ballast, batteries, cooking stove, etc, should be securely fastened in place. All stowage lockers containing heavy items should have lids or doors which are capable of being securely fastened.

17.17. Protection from Mosquitoes

17.17.1. Vessels regularly trading to and within mosquito infested ports should be fitted with appropriate devices to protect seafarers from mosquitos, as agreed by the Director General Merchant Shipping

17.18. Master's Inspections

17.18.1. There should be weekly documented inspections carried out on board 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.

17.18.2. The results of each inspection should be recorded and made available for review.

Crew Accommodation Facilities - vessels 200GT and over built after 12 January 2018

18.1. General

18.1.1. This section applies to vessels of 200GT or over, the keel of which was laid or was at a similar stage of construction, after the 12 January 2018.

18.1.2. When agreed with the Director General Merchant Shipping, vessels which are of traditional build and are true replicas of traditionally designed yachts, which includes wooden yachts, where their traditional character is incompatible with the detailed accommodation requirements, particularly with regard to cabin size, are excepted from the requirements of this section and should comply with Section 16.

18.1.3. Accommodation should provide decent living conditions and recreational facilities for all seafarers onboard the vessel. Due consideration should be given to likely numbers of hotel and support staff onboard

18.1.4. In order to provide decent living conditions and recreational facilities the following requirements are provided as minimum standards.

18.1.5. The materials used to construct internal bulkheads, panelling and sheeting, floors and joinings should be suitable for the purpose and conducive to ensuring a healthy environment. All relevant health and safety standards should be observed.

18.1.6. The accommodation should be adequately insulated; proper lighting and sufficient drainage should be provided.

18.1.7. There should 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 should 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 should be so constructed as to prevent ingress of water, cooking smells, and noxious gases into adjacent cabins.

18.2. Headroom

18.2.1. There should be adequate headroom in all seafarer accommodation. The minimum permitted headroom in all seafarer accommodation where full and free movement is necessary should 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 Director General Merchant Shipping.

18.3. Access/Escape arrangements

18.3.1. Refer to sections 12.16 ,12.17 and 12.18 for details.

18.4. Lighting

18.4.1. Seafarer's sleeping rooms and mess rooms should 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.

18.5. Heating

18.5.1. All accommodation spaces should be provided with, an adequate heating or air conditioning installation taking into account climatic conditions. The accommodation should be adequately insulated.

18.6. Ventilation

18.6.1. Sleeping rooms and mess rooms should be adequately ventilated. Vessels, except those regularly operating in areas where temperate climatic conditions do not require this, should be equipped with air conditioning for seafarer accommodation, for any separate radio room and for any centralised machinery control room. All sanitary spaces should have ventilation that draws from the accommodation and extracts to the open air, independently of any other part of the accommodation.

18.6.2. Mechanical ventilation should 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 should 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.

18.6.3. 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.

18.7. Sleeping Accommodation

18.7.1. The sleeping accommodation should meet 18.7.3 (the requirements for sleeping accommodation of the Maritime Labour Convention 2006 for vessels less than 3000GT). Where this is not practicable the sleeping accommodation should meet the substantially equivalent requirements of 18.7.4 for vessels of 200GT and over and less than 500GT, and 18.7.5 for vessels of 500GT and over and less than 1250GT. Vessels of 3000 GT and more should comply with the requirements of 18.7.6.

18.7.2. Sleeping accommodation should be of adequate size and properly equipped so as to ensure reasonable comfort and to facilitate tidiness.

18.7.3. Sleeping Accommodation - for vessels up to 3000 GT;

1) Sleeping rooms should 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.
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 should be agreed with the Director General Merchant Shipping. Where the sole of the sleeping accommodation is below the deepest waterline amidships, a bilge flooding alarm should 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 vessels operation in area categories 3.4 and 5, 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 deck head lining should not be immersed. Satisfactory arrangements should be made for lighting and ventilation.
3) Separate sleeping rooms should be provided for men and for women.
4) A separate berth for each seafarer should in all circumstances be provided. The minimum inside dimensions of a berth should 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) The master, the chief engineer and the chief navigating officer should 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 should 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 ship is not engaged in navigation. When the ship is engaged in navigation, the watchkeepers should not be distracted.
6) Sleeping rooms should not be subject excessive noise or vibration which may affect the seafarer's ability to rest.
7) Every seafarer is to 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 should be 500 litres. The locker should 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 Director General Merchant Shipping 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 should 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 should 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 should 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 should be provided for each seafarer, the floor area of which should 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 are provided should 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 should 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 are provided should 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 should be required to share a cabin.

18.7.4. Sleeping Accommodation - Equivalent arrangements to the Maritime Labour Convention 2006 for vessels of 200GT and over and less than 500GT;

1) Sleeping rooms should 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.
2) Sleeping rooms should not be subject excessive noise or vibration which may affect the seafarer's ability to rest.
3) 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 should be agreed with the Director General Merchant Shipping. Where the sole of the sleeping accommodation is below the deepest waterline amidships, a bilge flooding alarm should 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 vessels, 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 deck head lining should not be immersed. Satisfactory arrangements should be made for lighting and ventilation.

4) Separate sleeping rooms should be provided for men and for women.
5) A separate berth for each seafarer should in all circumstances be provided. The minimum inside dimensions of a berth should 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 should 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) Where practical, the master, the chief engineer and the chief navigating officer should 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 should 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 ship is not engaged in navigation. When the ship is engaged in navigation, the watchkeepers should not be distracted.
7) Every seafarer is to 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 should be 500 litres. The locker should 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 Director General Merchant Shipping 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 should 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) Where a single berth seafarer's cabin without en-suite sanitary facilities is provided it should have a floor area of not less than 3.6 square metres.
10) A single berth seafarer's cabin provided with en-suite sanitary facilities, should 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.
11) Sleeping rooms occupied by two seafarers without en-suite sanitary facilities should have a floor area of not less than 7 square metres.
12) A cabin occupied by two seafarers where en-suite sanitary facilities are provided should 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.
13) Where the reduced floor areas in 18.7.4.9 to 18.7.4.12 are adopted, the free floor area in the sleeping accommodation should be at least 1.45 square metres per seafarer to provide for sufficient comfortable movement.
14) Where the requirement of 18.7.4.13 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 Director General Merchant Shipping's agreement but should not be less than 1 square metre per seafarer.
15) Where the requirements of 18.7.4.14 are accepted by the Director General Merchant Shipping, the en-suite sanitary facilities should 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 should never be less than 1 square metre per seafarer.

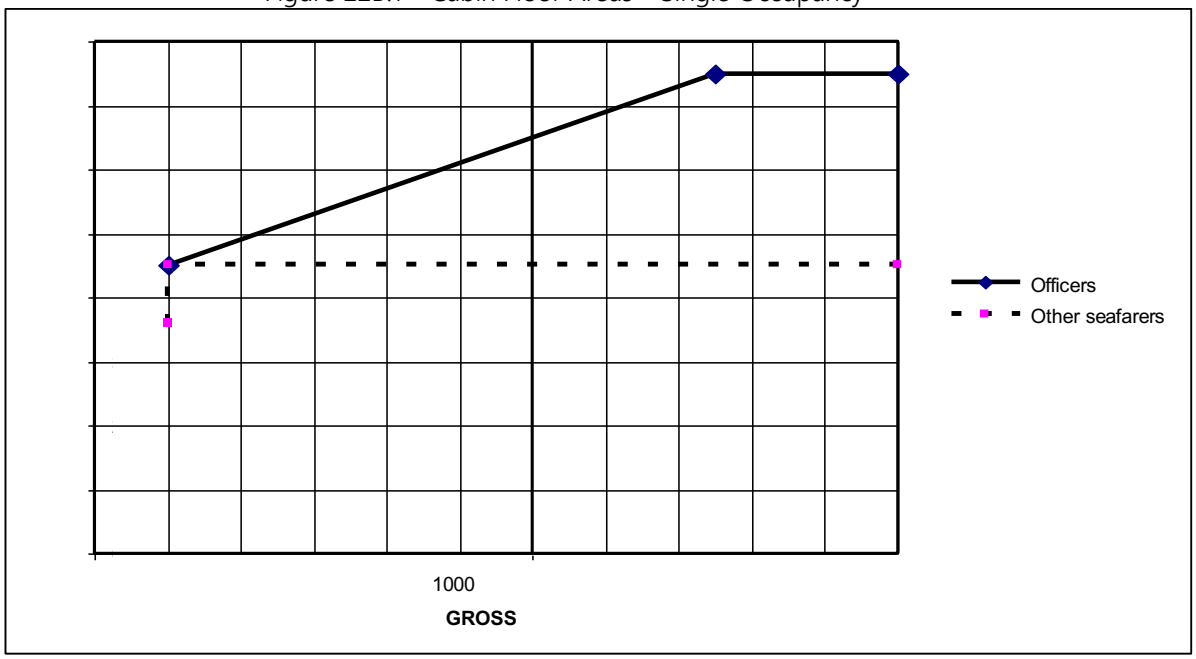
Accommodation Facilities

18.7.5. Sleeping Accommodation - Equivalent arrangements to the Maritime Labour Convention 2006 for vessels of 500GT and over and less than 1250GT.

1) Sleeping rooms should 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.
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 should be agreed with the Director General Merchant Shipping. Where the sole of the sleeping accommodation is below the deepest waterline amidships, a bilge flooding alarm should 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 should be arranged such that in the event of damage to the watertight compartment in which the accommodation space is situated, the deck head lining should not be immersed. Satisfactory arrangements should be made for lighting and ventilation.
3) Separate sleeping rooms should be provided for men and for women.
4) Sleeping rooms should not be subject excessive noise or vibration which may affect the seafarer's ability to rest.
5) separate berth for each seafarer should in all circumstances be provided. The minimum inside dimensions of a berth should 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 should 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) Where practical, the master, the chief engineer and the chief navigating officer should 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 should not be less than 4.5 square metres. If there is no dayroom provided see 18.7.5.15.
7) Every seafarer is to 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 should be 500 litres. The locker should 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 Director General Merchant Shipping 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 should 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) Where a single berth seafarer's cabin without en-suite sanitary facilities is provided it should have a floor area of not less than 3.6 square metres.
10) A single berth seafarer's cabin provided with en-suite sanitary facilities, should 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.
11) Sleeping rooms occupied by two seafarers without en-suite sanitary facilities should have a floor area of not less than 7 square metres.
12) Single occupancy cabins for seafarers who are officers for whom no adjoining sitting room, day room or equivalent additional space are provided should be not less than 4.5 square metres for a vessel of 500GT and not less than 7.5 square metres for vessels of 1250GT and over. For a vessel of intermediate gross tonnage the floor area should be determined by linear interpolation, as shown in

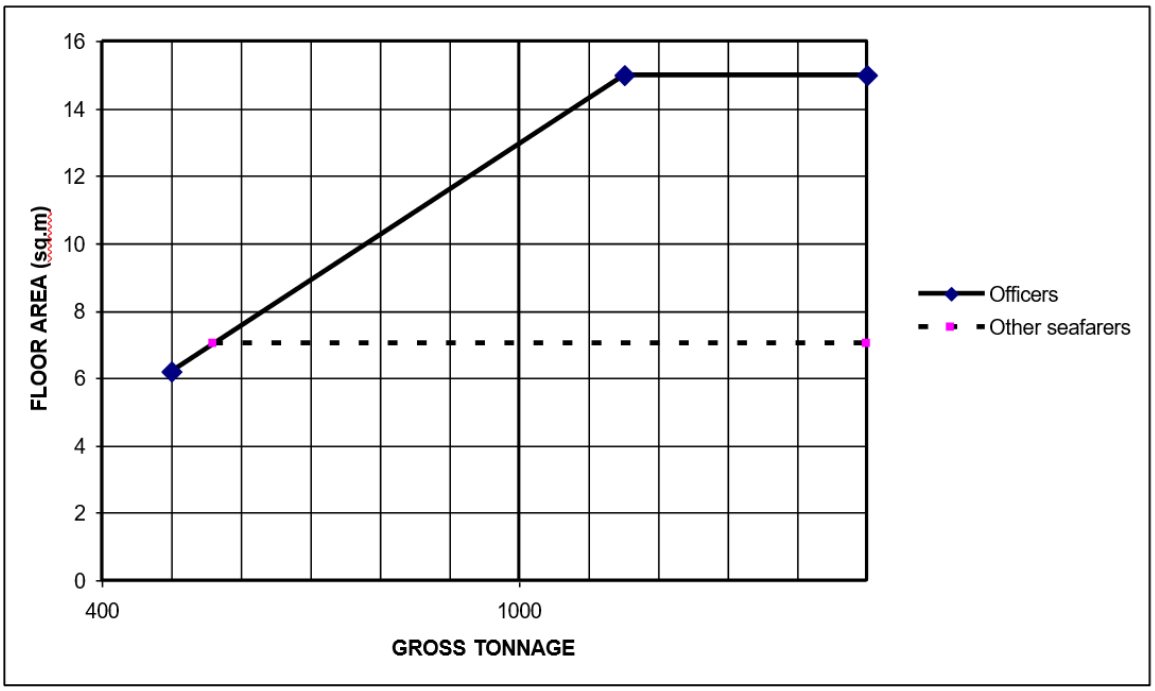
Figure below. En-suite sanitary facilities are considered to compensate for reduced floor area and form part of the floor area.

Figure 22B.1 – Cabin Floor Areas – Single Occupancy



13) 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 should be not less than 6.2 square metres for a vessel of 500GT and not less than 15 square metres for vessels of 1150GT and over. For a vessel of intermediate gross tonnage the floor area should be determined by linear interpolation, as shown in Figure below. For seafarers who are not officers, the floor area of a double occupancy cabin with en-suite sanitary facilities should increase at the same rate as cabins provided for seafarers who are officers until it is 7 square metres.

Figure 22B.2 – Cabin Floor Areas – Double Occupancy



14) Officer's cabins with a floor area less than 7.5 square metres should be provided with televisions and other suitable electronic audio-visual equipment.
15) Where adjoining sitting rooms, day rooms or other equivalent additional spaces are not provided in accordance with 18.7.5.12 an additional space providing a comfortable shared sitting area for such officers should be provided with a floor area of at least 1.5 square metres per officer. Such a space should 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 should not be distracted.

18.7.6. Sleeping Accommodation – yachts of 3000 GT or more
1) Vessels of 3000 GT or more constructed on or after the Maritime Labour Convention, 2006 enters into force should comply with the full requirements of standard A3.1 of the Maritime Labour Convention 2006.

18.8. Mess Rooms

18.8.1. Mess rooms should be located apart from the sleeping rooms to avoid disturbing those persons sleeping and as close as practicable to the galley. Mess rooms should 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.

18.8.2. Where the substantially equivalent arrangements in 18.7.4 and 18.7.5 are used, the floor area of mess rooms for seafarers should not be less than 1.5 square metres per person of the planned seating capacity.

18.9. Galley Areas, Food Preparation, Storage, and Provision of Food

18.9.1. Adequate food should be provided for all seafarers onboard free of charge. The provision of food should take account of the seafarers' religious requirements and cultural practices, the nature and duration of the voyage, and should be suitable in respect of quantity, nutritional value, quality and variety
.

18.9.2. The organisation and equipment of the catering department should be such as to permit the provision to the seafarers of adequate, varied and nutritious meals prepared and served in hygienic conditions. This should 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 should be provided with a non-slip surface and provide a good foothold.

18.9.3. All furniture and fittings in the galley should be made to be impervious to dirt and moisture. All metal parts of furniture and fittings should be rust resistant.

18.9.4. The ventilation in the galley should 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 are to provide a minimum of 25 cubic metres of air per hour, per person working in the ventilated space during normal operating conditions. Enclosed galleys are to be specially considered, and where air conditioning is not fitted should have, as a minimum, a mechanical supply of 20 fresh air changes per hour and a mechanical exhaust of 30 changes per hour.

18.9.5. When a cooking appliance is gimballed it should be protected by a crash bar or other means to prevent personal injury. Means should be provided to lock the gimballing mechanism.

18.9.6. Means should 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 should be provided.

Accommodation Facilities

18.10. Water Services

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

18.10.2. In addition, an emergency reserve supply of drinking water should 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 are to be to the acceptance of the Director General Merchant Shipping - for this purpose silver ionisation or chlorination would be considered acceptable.

18.11. Sanitary Facilities

18.11.1. 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 should be provided at a convenient location.

18.11.2. Separate sanitary facilities should be provided for men and for women. In respect of sanitary facilities for men and for women, vessels should 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.

18.11.3. Where a sleeping room is provided with en-suite sanitary facilities those facilities should include a minimum of one toilet, one wash basin and one tub or shower or both.

18.11.4. Where private or semi-private facilities cannot be provided, all seafarers should 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 should be available in all wash places.

18.11.5. Sanitary facilities within easy access of the wheelhouse, and the machinery space or near the engine room control centre should be provided where practical.

18.11.6. Every sleeping room should 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.

18.12. Hospital accommodation

18.12.1. Vessels carrying 15 or more seafarers and engaged in a voyage of more than three days' duration should 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 should be designed to facilitate the giving of medical first aid and to help prevent the spread of infectious diseases.

18.12.2. It is recommended that the arrangement of the entrance, berths, lighting, ventilation, heating and water supply should be designed to ensure comfort and facilitate the treatment of occupants.

18.12.3. Sanitary facilities should 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 should comprise a minimum of one toilet, one washbasin and one shower or tub.

18.12.4. Vessels operating in area categories 2,3,4 and 5 are exempt from 18.12.1. 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 should be designated exclusively for medical purposes. Such a cabin should 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 should be designed to ensure comfort and facilitate the treatment of occupants.

Accommodation Facilities

18.13. Laundry Facilities

18.13.1. Appropriately situated and furnished laundry facilities should be available.

18.14. Offices

18.14.1. Separate offices or a common office for use by deck and engineer seafarers should be provided where practicable.

18.15. Other Provisions

18.15.1. A space or spaces should be provided on open deck for the recreation of seafarers to which seafarers can have access when off duty. This should 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.

18.15.2. Vessels regularly trading to and within mosquito infested ports should be fitted with appropriate devices to protect seafarers from mosquitos, as agreed by the Director General Merchant Shipping.

18.15.3. Appropriate seafarers' recreational facilities, amenities and services, as adapted to meet the special needs of seafarers who live and work onboard should be provided.

18.16. Master's Inspections

18.16.1. There should be weekly documented inspections carried out on board 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.

The results of each inspection should be recorded and made available for review.

18.17. Hand Holds and Grab Rails

18.17.1. There should be sufficient hand holds and grab rails within the accommodation to allow safe movement around the accommodation at all times. Stairways should be specially considered.

18.18. Securing of Heavy Equipment

18.18.1. All heavy items of equipment such as ballast, batteries, cooking stove, etc, should be securely fastened in place. All stowage lockers containing heavy items should have lids or doors which are capable of being securely fastened.

18.19. Sailing Vessels

18.19.1. The requirements of Section 18 apply to sailing vessels in the same way as they do to motor vessels.

18.19.2. Where the sailing vessel is below 1500GT the variations described in 18.19.3 and 18.19.4 may be adopted.

18.19.3. On a case by case basis where due to the number of seafarers and passengers on a sailing vessel, for example a sail training vessel or a sailing vessel used for racing, it is not possible to meet the equivalent arrangements of 18.7.4.14 (minimum of 1 square metre free floor area per seafarers), seafarers should have no worse accommodation arrangements than the passengers.

18.19.4. Where it is not possible to meet the requirements of 18.7.5.15due 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 Director General Merchant Shipping. Such a space should allow the seafarers who are officers to meet privately, or the seafarers who are officers to meet with other seafarers privately.

Protection of Personnel

19.1. Deckhouses and Superstructures

19.1.1. The structural strength of any deckhouse or superstructure should comply with the requirements of one of the IACS Classification Societies, as appropriate to the vessel and its areas of operation.

19.2. Bulwarks and Guardrails

19.2.1. Bulwarks and/or guardrails on all accessible decks should be 1000mm high except that on vessels built to 1959 Load Line Rules these may be 915mm high. Any opening should not exceed 380mm. Where no bulwarks are fitted, or bulwark height is less than 230mm, the lowest opening should not exceed 230mm. They should be supported at intervals not exceeding 2.2 metres. Intermediate courses of rails or wires should be evenly spaced.

19.2.2. Satisfactory means (in the form of guard rails, life lines, gangways or underdeck passages, etc.) should 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.

19.2.3. Where the function of the vessel would be impeded by the provision of bulwarks and/or guard rails complying with 19.2.1, alternative proposals detailed to provide equivalent safety for persons on deck should be submitted to the Director General Merchant Shipping for approval.

19.3. Safe Work Aloft, Overside, and on the Bowsprit of Sailing Vessels

19.3.1. When access to the rig, bowsprit, or overside working is required, provision should be made to enable people to work safely, in accordance with national and or ISO standards.

19.3.2. The arrangements provided should 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, overside, and for work on the bowsprit;
4) sufficient footropes and horses in wire (or rope) permanently rigged to enable seamen 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:
   - fixed metal steps or ladders attached to the mast; or
   - traditional ratlines (rope) or, rattling bars (wood/steel), fixed across the shrouds to form a permanent ladder.

19.4. Personal Clothing

19.4.1. It should be the responsibility of an owner/managing agent/skipper to advise that the following requirements for items of personal clothing should be met:

1) Each person on board a vessel should have protective clothing appropriate to the prevailing air and sea temperatures.
2) Each person on board a vessel should have footwear having non-slip soles, to be worn on board.

19.5. Noise

19.5.1. Vessels covered by this Code should meet the recommendations of the IMO Code on Noise Levels on Board Ships, Resolution A.468(XII), published 1982so far as is reasonable and practicable.

19.5.2. The IMO Code on Noise Levels on Board Ships promotes the control of noise within the framework of internationally agreed guidelines, whilst recommending methods of measuring noise at listening posts.

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

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

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

19.5.6. The limits have been set from hearing damage risk considerations and the use of suitable ear protectors.

19.5.7. To indicate the need to wear ear protectors, safety signs, signs with symbols and supplementary warning notices should be displayed at all entrances to spaces in which the noise level exceeds 85dB(A).

19.6. Lifts

19.6.1. Personnel lift installations should be appropriately designed and constructed, installed and tested by a competent person.

19.6.2. Designs should be submitted at an early stage of construction. Recognised international standards such as BS EN 81 should be considered but the following gives a minimum standard that should be provided:

1) Structural fire protection requires lift shaft within an "A" class division as per section 12.4.11. 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 should be supported by a certificate from a Classification Society or manufacturer and include a relevant load test.
3) Lift should comprise an enclosed capsule.
4) A suitable means of escape from the capsule and lift shaft should be provided.
5) Mains and emergency power to be provided, where necessary to comply with item.
6) Emergency lighting to be provided.
7) An internal alarm and telephone to be provided.
8) Normal operation should ensure lift only stops at each deck.
9) "Not to be used in case of fire" sign to be posted within. Reference standards include:
   - BS EN 81 series – Safety rules for the construction and installation of lifts BS 5655 series – Lifts and service lifts

19.7. Medical Stores

19.7.1. All vessels must carry medical stores according to the requirements specified in the UK MCA "Merchant Shipping Notice - MSN 1768 (M+F)", as follows

- Vessels operating in area categories 3, 4 and 5 must have on board Category C medical stores – an extract from the MSN is provided in annex ddd for guidance
- Vessels operating in area categories 1 and 2 must have on board Category B medical stores, refer to the UK MSN for guidance, a full copy of the MSN must be carried on board
- Vessels operating in area category 0 must have on board Category A medical stores, refer to the UK MSN for guidance, , a full copy of the MSN must be carried on board

19.8. Tenders

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

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

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

19.8.4. In the case of petrol-engined tenders, see section 12 for the safety requirements for the carriage of petrol.

19.9. Pilot for Vessel

19.10.1. Boarding arrangements provided for pilots should have due regard for SOLAS Chapter V, Regulation 23 and IMO Resolution A.889 (21) "Pilot transfer arrangements", International Maritime Pilots' Association (IMPA) recommendations, or any documents replacing them.

19.10. Gangways, Passerelles, and Accommodation Ladders

19.11.1. A safe means of access is to be provided at all times when in port, either deployed or available for deployment. If the safe means of access is not deployed, there should be a means provided for communication between those on the quay and those on board.

19.11.2. When provided, gangways, passerelles, and accommodation ladders should 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) should be provided on both sides.

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

19.11.4. Accommodation ladders should be provided on a vessel of 120 metres in length and over.

19.11.5. Access equipment and immediate approaches to it should be adequately illuminated.

19.11.6. Reference standards include:
- BSMA 78:1978 - Gangways (excluding the maximum overall widths specified in table 2); and
- BSMA 89:1980 - Accommodation Ladders;
- ISO 7061:1993 -Shipbuilding - Aluminium shore gangways for seagoing vessels; ISO 5488:1979 - Shipbuilding - Accommodation ladders.

19.11. Submersible Craft

19.12.1. Submersible Craft carried on yachts should comply with National or ISO Standards and include the following:

- They should be constructed and maintained in accordance with the rules of a recognised Classification Society, applicable national regulations and be suitable for the intended use.
- Supporting equipment should be constructed and maintained in accordance with the rules of a recognised Classification Society and any applicable national regulations. The maximum safe working load of the equipment and maximum sea state in which the craft may be launched are to be stated.
- A safety management system which may be separate from any system operated by the parent vessel, including an operations manual, must be in place, and subject to annual audit.
- Following satisfactory survey and audit, certification for safety of submersible craft and its support equipment should be issued, and is subject to annual survey.
- Maintenance should be carried out by the manufacturer or an organisation or person accepted by the Director General Merchant Shipping at intervals specified by the manufacturer.
- Operating crew to have adequate theoretical and practical training for the type of submersible craft onboard, and have demonstrated ability to operate it.

19.12. Personal Water Craft

19.13.1. The operators are reminded that operation of personal watercraft should comply with the applicable legislation of the state in whose waters they are being operated

19.13. Manning and Personnel Certification

19.14.1. The manning and personnel certification should be in accordance to the Merchant Shipping (Non-Convention Vessel) Regulations, No.1 of 2024 and Merchant Shipping Licensing of Boat Masters, Boat Engineers and Crew Regulations 2019

Prevention of Pollution

20.1.1. Vessels should comply with all the requirements of MARPOL as prescribed by the regulations of the Director General Merchant Shipping. For vessels under 400GT it is the owner's responsibility to comply with local Director General Merchant Shipping/port state requirements and for dealing with oily bilge water retention etc.

20.1.2. Every ship of 100GT and above, and every ship which is certified to carry 15 persons or more, should carry a garbage management plan which should 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.

20.1.3. 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.

20.1.4. All yachts should comply with the hull Anti-Fouling System Convention requirements..

Safety Management

21.1.1. All vessels of 500GT and over, and associated managers, are required to comply with the IMO's International Safety Management Code

21.1.2. All vessels under 500GT should employ a safety management system as described in Annex 4.

21.1.3. All vessels should include emergency towing procedures, as required by SOLAS regulation II-1/3-4, in their safety management system or in a separate plan.

Prevention of Pollution

International Ship and Port Facility Code

22.1.1. All vessels of 500GT and over are required to comply with the IMO's International Ship and Port Facility Security Code.

Annexures

Annex 1 – Large Yacht Code Certificate

Certificate Number

Democratic Socialist Republic of Sri Lanka

LARGE YACHT CODE SAFETY CERTIFICATE

This certificate shall be supplemented by the Survey Record and Record of Equipment
Issued under the provisions of Merchant Shipping (Non- Convention Vessel) Regulations, No.1 of 2024 and the Merchant Shipping (Vessel Classification and Certification) Regulations, No.3 of 2024

.....
Name of Certifying Body

Type of Ship : ..... *Motor / Sail / , Mono / Multi Hull*.....
Vessel Group : .....

Operational Area Category	0	1	2	3	4	5	6	7	8	9
Assigned										

Nominated Departure point for Area Categories 4 or 5 : .....

Particulars of Ship

Name of Ship: Distinctive Numbers :
Registration Number: Port of Registry
IMO Number (If Available) Date* :
Gross tonnage Net Tonnage
Load Line Length

* Date on which the Keel was laid or at similar stage of construction or where applicable date on which work for conversion or an alteration or modification of a major character was commenced

This is to certify

1) That the ship has been surveyed in accordance with the requirements of the Large Yacht Code 2025
2) That the survey showed that the condition of the structure, subdivision, structural fire protection, machinery, ships equipment and systems, lifesaving appliances and equipment, firefighting appliances and equipment, navigational equipment, radio installations and in all other respects, the vessel has complied with the relevant requirements of the code.
3) That the maximum number of persons on board the vessel should not exceed ..... and the maximum number of passengers on board should not exceed.....
4) That an Exemption certificate has/has not been issued

This certificate is valid until Issued at

Date of issue Signature of authorized official seal or stamp of certifying body

Annual / Intermediate Survey endorsements

This is to certify that the vessel has been surveyed in accordance to the survey requirements of the code for the type of survey as given

Type of Survey

Place of Survey

Date of Survey

Signed Seal or stamp of Certifying Body

This is to certify that the vessel has been surveyed in accordance to the survey requirements of the code for the type of survey as given

Type of Survey

Place of Survey

Date of Survey

Signed Seal or stamp of Certifying Body

This is to certify that the vessel has been surveyed in accordance to the survey requirements of the code for the type of survey as given

Type of Survey

Place of Survey

Date of Survey

Signed Seal or stamp of Certifying Body

This is to certify that the vessel has been surveyed in accordance to the survey requirements of the code for the type of survey as given

Type of Survey

Place of Survey

Date of Survey

Signed Seal or stamp of Certifying Body

Annex 2 - Initial Survey Record & Record of Equipment

	Democratic Socialist Republic of Sri Lanka Merchant Shipping Secretariat	Certification Number:
	Record of Equipment Large Yacht Code	Expiration Date:

1.0 Particulars of vessel

Name of Vessel	Distinctive Numbers:	
Registration Number:	Port of Registry	
IMO Number (If Available)	Date of Build*:	
Builders Name and Address	Yard Number	Hull Material
Vessel Group:	LOA	Breadth
Vessel Type Motor ☐ Sail ☐ Mono Hull ☐ Multi Hull ☐		
Assigned Operational Areas	Nominated Departure Point for Area Category 4 or 5	
Total number of persons on board	Maximum number of Passengers	
This vessel shall be manned with the following personnel: -		

* Date on which the Keel was laid or at similar stage of construction or where applicable date on which work for conversion, or an alteration or modification of a major character was commenced

Annexures

2.0 Record of Equipment

Code Ref	Description	Provided
11.2	Total number of Lifeboats (Total number of persons accommodated)	
11.2	Number of Lifeboats on Port side (number of persons accommodated)	
11.2	Number of Lifeboats on Stbd side (number of persons accommodated)	
11.3	Total number of Liferafts (Total number of persons accommodated)	
11.1 & 11.9	Total number of Lifebuoys	
11.1 & 11.9	Number of Lifebuoys with light	
11.1 & 11.9	Number of Lifebuoys with light and smoke signals	
11.1 & 11.9	Number of Lifebuoys with buoyant line	
11.1 & 11.9	Number of Lifebuoys without attachments	
11.7	Total number of Life jackets (Type)	
11.7	Number of child Life jackets (Type)	
11.8	Number of immersion suits	
11.8	Number of thermal protective aids	
11.10	EPIRB	
11.11	SART	
11.4, 11.5 & 11.6	Tenders (Rescue boat)	
11.1	Number of parachute flares	
11.1	Number of Red hand flares	
11.1	Number of smoke signals (buoyant /hand-held)	
11.1	Line throwing apparatus	
11.1	Portable VHF set	
11.12	General Alarm	
11.14	Lifesaving signals table	
11.1	Training Manual	
11.1	Instructions for onboard maintenance of Life saving equipment	
12.21	Fixed Fire extinguishing system (Type)	
12.21	Number of portable fire extinguishers	
12.21	Fire Pumps (power driven)	
12.21	Number of Fire hoses with spray nozzles	
12.21	Fire Blanket	
12.21	Fireman's outfit	
13.3	VHF fixed radio installation	
13.3	MF SSB radio installation with DSC	
13.3	MF/HF Transceiver with DSC	
13.3	Inmarsat Ship Earth Station	
13.3	Navtex receiver	

Annex 3 - Model Stability Information Book

This annex outlines the information requirements that is expected from a stability information book.
The Booklet should include all applicable items for a particular vessel from the sections below, the format should be as set out.

The Stability Information booklet is arranged into sections, sections are arranged such that the most essential matters are brought to the user's attention first
The sections of a Stability Information book are;

- Section 0 – Cover page, contents page and Vessel information
- Section 1 - Operational information
- Section 2 - Technical data and loading conditions
- Section 3 - Reference information including lightship and VCG derivation
- Name and version number of stability software used

SECTION	PAGE/DESCRIPTION	CONTENTS
Section 0	Front Cover	Name of vessel Intact Stability Information Booklet Date of issue Version number Name and address of Naval Architect
	Contents	Contents with page numbers
	General Particulars	Vessel's name Official number Port of registry (if applicable) Certifying body Number of persons carried Maximum weight of cargo Area of operation Name and address of Owners Class Material of construction Yard number Builder's name and address Fitted out by (if different) Date of build Date of commissioning Dimensions Length overall Length BP Moulded beam Depth Rake of keel Displacements: fully laden, lightship Draughts: fully laden, lightship Minimum freeboard: lightship freeboard Gross and net tonnage
	General Arrangement	Profile {Including definition of FP, AP Plan} midships, base line
	Arrangement of Tanks & Ballast	Plan and profile views showing tank positions and position of any permanent ballast

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SECTION	PAGE/DESCRIPTION	CONTENTS
Section 1	Stability information	Special notes regarding the stability of the vessel Example of static stability curve with details of Area A, Area B, Area C, Point X, Maximum GZ and Initial GM General precautions against capsizing and downflooding Area of operation Stability criteria Weather Reference to location of downflooding openings Statement ref. maximum crane load (kg) and maximum outreach (m) (if applicable) and any other relevant advice ref. crane operation, such as the provision and use of an inclinometer Maximum VCG (KG) curve with appropriate range of displacement and trim Example showing the use of the maximum KG curve Summary of pass/fail margins and stability category for each load condition
Section 2	Freeboard and draught marks	Depth from baseline to top of deck at midships (m) Maximum fully laden draught at midships (m) Minimum freeboard at midships (m) Position of midships (metres aft of foreside of stem at deck level) Diagram showing location and dimensions of draught mark Determination of draughts at AP and FP relative to BL from draughts read at marks Draught marks and hydrostatic datum Drawing identifying draught marks and datum
	Downflooding points	Drawing identifying downflooding openings Table listing each downflooding point, the area of each opening, the angle of immersion in each load case
	Tank Capacities	Arrangement of tanks and ballast Drawing showing tanks and ballast fitted Table listing tank capacities, fluid, location, weight, LCG, VCG, TCG and FSM Details of ballast weight and location Reference to baseline, forward perpendicular, transverse origins and +ve –ve trim
	Loading Conditions	Information to be included for each condition; Weights and centres table, referenced to LCG, VCG, TCG and free surface Include Draught @ AP, Draught @ FP, mean draught, trim, GM solid, Free surface correction GM fluid GZ curve - incl critical downflooding angle GZ data and assessment against criteria Table with DISP, Draft FP, Draft AP, WSA. WPA, LCB, VCB, GZ, LCF, TCF against heel angle 0 to 90 degrees Stability summary, detailing required criteria, achieved criteria, margin and pass/fail Required Loading conditions ; Loading condition - Departure 100% consumables Loading condition - Arrival 10% consumables Other conditions as required for the operation of the craft any other relevant load condition, for instance different load/passenger combinations

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SECTION	PAGE/DESCRIPTION	CONTENTS
	Hydrostatic Data – for an appropriate range of drafts and three trims	Tables of data for : displacement, wetted area, LCB, LCF, KB, KMT, KML, TPC, MTC Suggested Trims Trim 1 degree forward (or as may be appropriate) Level trim Trim 1 degree aft (or as may be appropriate)
	KN Data - For an appropriate range displacement vs. appropriate range of heel angle	Suggested Trims KN data - Trim 1 degree forward (or as may be appropriate) KN data - Level trim KN data - Trim 1 degree aft (or as may be appropriate) Notes on the use of KN data (refer to sample book for text) Insert hull section drawing illustrating the relative positions of K, M, G, GZ and B
	Free Surface Moments	Notes on the use of free surface moments Include calculation of maximum free surface moment
Section 3	Reference information	lightship and VCG derivation Inclining experiment report Vessel type specific information such as, Crane details and restrictions, maximum specific gravity of spoil for dredgers, towing details and restrictions etc Record of minor modifications Beaufort scale of wind speeds and corresponding pressures Metric/imperial conversion

Annex 4 - Safety Management System for Vessels Under 500gt

INTRODUCTION

1. The purpose of this Annex 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.

GENERAL

2. Each operator should create a safe working environment, which should include the following:

A health and safety protection policy.

2.1 This must 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) will 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] will carry out an assessment of the risks to the health and safety of workers and others affected by [the undertaking], and will take the necessary measures to minimise the risks identified."

2.2 The owner/operator 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.

Procedures to ensure safe operation of vessels in compliance with the regulations and rules.

2.3 The regulations and rules, not addressed by this Code of Practice, which apply to all vessels include, but are not limited to:

- International Regulations for Preventing Collisions at Sea;
- Local Navigation Rules;
- National health and safety regulations;
- The Code of Safe Working Practices for Merchant Seamen;
- All relevant national shipping or guidance notices.

2.3.1 The company should 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.

2.3.2 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 should be accepted as evidence of compliance with the ONBOARD PROCEDURES requirements.

Lines of communication between personnel, ashore and afloat.

2.4 Responsibility and authority of each employee should be clear. This may be best illustrated in a simple diagram, showing who reports to whom.

Procedures for reporting accidents.

2.5 The requirement for reporting accidents should be well understood by all personnel and in so doing improve the safety culture practiced on board.

Procedures for responding to emergency situations.

2.6 There should be clearly stated procedures for responding to emergency situations. These may include but not be limited to:

- fire
- collision
- grounding
- violent act
- main propulsion or steering failure
- man overboard

2.6.1 Checklists may be useful in this regard.

HEALTH AND SAFETY PROTECTION POLICY

3. One or more competent persons should be delegated to take responsibility for health and safety, and that person/persons should be clearly identified. It is the responsibility of the owner/operator to ensure that the policy is complied with, and that the responsibilities are understood.

4. The company/owner should develop a policy on prevention of alcohol and drug abuse.

5. 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.

6. 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.

RESPONSIBILITIES

7. The Master must have authority at all times, to make decisions with regard to the safety of the vessel and the persons on board. To ensure that there is no ambiguity regarding the authority of the Master, there should be a simple written statement to this effect.

PERSONNEL AND TRAINING

8. All personnel should 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.

9. As a minimum, this means:

- for the Master, the relevant qualifications;
- for the crew, relevant qualifications and any additional training appropriate to their designated duties.

10. Prior to the first occasion of working on the vessel, each employee must receive appropriate familiarisation training and proper instruction in onboard procedures. This could include, but not necessarily be, limited to:

- mooring and unmooring;
- launching and recovery of survival craft;
- evacuation from all areas of the vessel;
- donning of lifejackets; and
- use and handling of fire fighting equipment.

ONBOARD PROCEDURES

11. Simple procedures should be developed for the operation of the vessel. These should include, but not be limited to:

- testing of equipment, including steering gear, prior to commencing a passage;

- navigation and handling of the vessel;
- maintenance routines;
- bunkering operations;
- watertight/weathertight integrity;
- stability of the vessel;
- conduct of passengers and crew while on board;
- emergency towing (may be in a separate document);
- safe use and qualification of users for personal watercraft.

PREPARATION FOR EMERGENCIES

12. The potential emergencies likely to be encountered by the vessel should be considered. Exercises should then be carried out in the handling of these emergencies and evacuation from the vessel.

13. Where possible, all personnel should be involved in these exercises, both ashore and afloat.

14. The roles and responsibilities of all personnel in an emergency situation should be defined.

15. The exercises should be recorded. The names of those who participated should also be recorded.

REPORTING OF ACCIDENTS

16. Vessels operating under this Code are required to report any accidents to the Administration and the company must therefore have a procedure in place. Additionally, all accidents and near accidents should be recorded and reported to the operator/owner, who should implement corrective action, with the aim of improving safety.

MAINTENANCE OF THE VESSEL AND EQUIPMENT

17. Maintenance of the vessel and equipment is an essential ingredient of safety management. The equipment should be checked and tested daily when in use, in addition to the tests referred to in the ONBOARD PROCEDURES section of the Code.

18. There should be procedures for a more detailed inspection and maintenance programme of the vessel and equipment.

19. The frequency of the inspections should be determined by the owner/operator, but every event should be recorded.

20 A checklist could be employed as an aide memoir for the inspection of equipment.

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REVIEW

21. Every company/owner should undertake a review of the safety management system of all vessels at least once in every three years.

Annex 5 Open Flame Gas Installations

1 General Information

1.1 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.

1.2 Consequently, the siting of gas-consuming appliances and storage containers and the provision of adequate ventilation to spaces containing them, is most important.

1.3 It is dangerous to sleep in spaces where gas-consuming open flame appliances are left burning, because of the risk of carbon monoxide poisoning.

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.

1.5 A frequent cause of accidents involving LPG installations is the use of unsuitable fittings and improvised "temporary" repairs.

2 Stowage of Gas Containers

2.1 LPG cylinders, regulators and safety devices should 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.

2.2 The vent and drain should not be less 19mm in diameter, run to the outside of the craft and terminate 75mm or more above the "at rest" waterline. Generally, the drain and locker ventilation should be 500 mm or more from any opening to the interior.

2.3 The cylinders and associated fittings should be positively secured against movement and protected from damage in any foreseeable event.

2.4 Any electrical equipment located in cylinder lockers should be certified safe for use in the potential explosive atmosphere.

3 Cylinders and Attachments

3.1 Each system should be fitted with a readily accessible, manually operated isolating valve in the supply pressure part of the system.

3.2 In multiple container installations, a non-return valve should be placed in the supply line near to the stop valve on each container. If a change-over device is used (automatic or manual), it should be provided with non-return valves to isolate any depleted container.

3.3 Where more than one container can supply a system, the system should not be used with a container removed, unless the unattached pipe is fitted with a suitable gas tight plug arrangement.

3.4 Containers not in use or not being fitted into an installation should have the protecting cap in place over the container valve.

4 Fittings and Pipework

4.1 For rigid pipework systems solid drawn copper alloy or stainless steel tube should be used. Steel tubing, aluminium, or any materials having a low melting point should not be used.

4.2 Connection between rigid pipe sections should be made with, hard solder (minimum melting point 450ºC). Appropriate compression or screwed fittings are recommended for general use for pipework in LPG installations.

4.3 Lengths of flexible piping (if required for flexible connections) should conform to an appropriate standard, be kept as short as possible, and be protected from inadvertent damage. Such hose should 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) should be submitted to the Administration for approval on an individual basis.

5 Appliances

5.1 All appliances should be well secured to avoid movement.

5.2 All unattended appliances should 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.

5.3 All gas burners and pilot flames should be fitted with a flame supervision device which will shut off the gas supply to the burner or pilot flame in the event of flame failure

5.4 Flue-less heaters should 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.

5.5 Heaters of a catalytic type should not be used.

6 Ventilation

6.1 The ventilation requirements of a space containing a LPG appliance should be assessed against an appropriate standard and should take into account gas burning equipment and persons occupying that space.

6.2 Where ventilators required for LPG appliances in intermittent use can be closed, there should be appropriate signs at the appliance warning of the need to have those ventilators open before the appliance is used.

7 Gas Detection

7.1 Suitable means for detecting the leakage of gas should be provided in any compartment containing a gas-consuming appliance, or in any adjoining space of a compartment into which the gas (more dense than air) may seep.

7.2 Gas detectors heads should 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 should at least be fitted below the lowest point of ignition.

7.3 Any gas detector should preferably, be of a type which will 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 should 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.

7.4 Where electrical detection equipment is fitted, it should be certified as being flame-proof or intrinsically safe for the gas being used.

7.5 In all cases, the arrangements should be such that the detection system can be tested frequently whilst the vessel is in service, which should include a test of the detector head operation as well as the alarm circuit, in accordance with the manufacturer's instructions.

7.6 All detection equipment should be maintained in accordance with the manufacturer's requirements.

8 Emergency Action

8.1 A suitable notice, detailing the action to be taken when an alarm is given by the gas detection system, should be displayed prominently in the vessel.

8.2 The information given should include the following:

.1 The need to be ever alert for gas leakage; and

.2 When leakage is detected or suspected, all gas-consuming appliances should be shut off at the main supply from the container(s) and NO SMOKING should be permitted until it is safe to do so.

.3 NAKED LIGHTS SHOULD NEVER BE USED AS A MEANS OF LOCATING GAS LEAKS.