Chapter III

Hull, Machinery and Electrical Installations

1 Standards for Construction and Installations etc.

1.1 The vessel's strength, structure, arrangements, materials, scantlings, main and auxiliary machinery, boilers and pressure vessels, electrical installations, etc. shall be so designed, constructed and installed as to ensure that the vessel is fit for the service for which it is intended. Owner or builder may make reference to any relevant standards of an authorized organization for pleasure vessels or small craft or appropriate standards for equipment and material or any other equivalent standards.

2 Hull Construction and Marking

2.1 (1) The vessel shall be designed and constructed to:

(a) provide structural strength adequate for the intended services of the vessel;

(b) maintain adequate freeboard and stability; and

(c) prevent the ready ingress of sea water.

(2) Vessel shall not have false bottom or secret compartment.

2.2 Bulwarks, guard/hand rails or equivalent protection/fixing shall be installed near the periphery of weather decks accessible to passengers and crew.

2.3 Bulkheads of vessel except those of wooden construction, and as far as practicable on wooden vessel in particular the foremost bulkhead, shall be of watertight construction.

2.4 (1) Every enclosed space shall be provided with suitable ventilation and lighting. Every such space for regular entrance by crew or working personnel shall be suitably mechanically ventilated and illuminated.

(2) Every deck house shall be provided with appropriate insulation to avoid from excessive heat.

2.5 The certificate of ownership number of a vessel must be painted and mounted in accordance with section 38 of the Certification and Licensing Regulation.

~~2.6 (1) For any new vessel, an inclining test shall be carried out in accordance with the standards of an authorized organization or equivalent standard.~~

~~(2) As alternative to (1) above, for any new vessel licensed to carry not more than 12 passengers, a simple inclining test shall be carried out with the objective to ascertain that no angle of heel exceeding 7^{o} will arise when 2/3 of the passengers distributed on one side of the vessel and 1/3 on the other side. If the length of the new vessel is not exceeding 6 metres, an immersion test to prove its adequacy of buoyancy is also acceptable as an alternative. (Amended G.N. 1134 of 2017)~~

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~~2.7 For any existing vessel, a simple inclining test shall be carried out to ascertain the angle of heel a vessel would occur when 2/3 of the passengers distributed on one side of the vessel and 1/3 on the other side. The objective is to ensure that no angle of heel exceeding 7° will arise as a result of the movement of passengers from one side of the vessel to the other side. If the vessel is not exceeding 6 metres, an immersion test to prove its adequacy of buoyancy is also acceptable as an alternative. (Amended G.N. 1134 of 2017)~~

2.6 If a pleasure vessel not let for hire that is licensed to carry not more than 60 passengers changes its use to let for hire, an inclining test or calculation shall be conducted according to the standards of an authorized classification society or their equivalent. Alternatively, relevant certificates (such as class certificates or CE certificates), documents or declarations issued by an authorized classification society or a certification body shall be provided.

2.7 As an alternative to section 2.6 above, a simple inclining test can be conducted. Please refer to Annex 5 for details –

(1) for Class IV vessels (including open or enclosed deck vessels) that are licensed to carry not more than 12 passengers, there is a need to ascertain that the angle of heel will not exceed 7° when having 2/3 of the passengers distributed on one side of the vessel and 1/3 on the other side. The test is to be carried out in accordance with the details stated in Part 1; or

(2) for Class IV vessels (including open or enclosed deck vessels) that are licensed to carry 13 to 60 passengers, there is a need to ascertain that the angle of heel will not exceed 10° when all passengers move from one side of the vessel to the other side. The test is to be carried out in accordance with the details stated in Part 2.

If the vessel isless than 6 metres in length, conducting an immersion test to prove its adequacy of buoyancy is also acceptable.

3 Machinery Installations

3.1 Suitable means of protection or device shall be provided to machinery, equipment, winches, etc. so as to reduce to a minimum any danger to person on board. Special attention shall be paid to moving parts, hot surfaces and other dangers.

3.2 Machinery spaces shall be so designed and built so as to prevent risk of fire or explosion, and provide safe and free access to all machinery and its controls as well as to any other part that may require servicing. Adequate ventilation shall be provided for the machinery spaces.

3.3 On any open deck vessel capable of cruising at high speeds (Note), it is recommended that a safety device capable of tripping the propulsion engine(s), shall the vessel become out of control, be fitted. For a jetski, manufacturer recognized engine cutoff device or as appropriate, is to be fitted on board.

Note

When an open deck vessel is rated with operating speed exceeding 17 knots or capable to achieve that speed, it is also termed as “high speed open deck vessel”

3.4 If the vessel is of wooden construction, it is recommended that a metal tray, which can readily be cleaned, be fitted under the engine to protect the bilges against saturation by oil.

3.5 The engine's exhaust pipe and bulkhead piece shall be insulated with heat-resistant material unless it is served by a water-cooling system. A silencer or expansion chamber shall be fitted on the exhaust pipe.

3.6 The arrangements for filling fuel tanks shall be such that oil will not spill or overflow into any compartment of the vessel.

3.7 Fuel tanks shall be substantially constructed of suitable material and securely fixed in position. Fuel oil outlet valves shall be readily closed from a position outside the space where the tank is situated. A suitable metal tray for collection of leaking oil shall be fitted under each valve of oil tank. For portable petrol containers, requirements in Annex 2 of this Code are to be followed.

3.8 All fuel oil tank and lubrication oil tank venting pipes shall be led outside the compartment to open area. The open end of each venting pipe for fuel oil tanks shall be fitted with properly secured metallic wire-gauze.

3.9 Oil pipes, water pipes and engine exhaust pipes shall generally not be fitted above or close to any electrical distribution board, switchboard, etc., or any hot surface. If it is unavoidable to do so, suitable protection shall be provided.

3.10 Fuel oil pipes and their attachments shall be of adequate strength and free from excessive vibration.

3.11 A bilge pump of sufficient capacity shall be provided for any vessel of length (L) 8 metres and above.

3.12 When petrol is stowed onboard for use in outboard engines or portable generator engines, safety precautions as indicated in Annex 2 shall be strictly followed.

3.13 Every vessel of gross tonnage 400 and above must be fitted with an oily water separator of an approved type in compliance with the requirements of the Merchant Shipping (Prevention of Oil Pollution) Regulations (refer to Annex 10).

3.14 Engine Room and Wheelhouse Communication and Safety Arrangement

(1) On any vessel with manned engine rooms, a suitable system of communication between wheelhouse and engine room shall be provided.

(2) Any vessel with length as indicated below, operating in unattended machinery spaces mode, shall be provided with the following installation in the proximity of the position of helmsman:

(a) Vessel of $L \leq 24$ m

(i) for main engine - essential control (such as means of start and stop, control

of speed and clutch), indicators, abnormal alarms and remote stop.

(ii) for generator engine and engine room ventilation fans - means to stop

(iii) for bilge water in engine room - high level audible alarm. (Note)

(vi) for existing vessels, a fixed fire detection (operated by smoke detectors) and fire alarm system for engine room are recommended. If these fittings are not installed, regular surveillance shall be exercised from outside engine room or control station by the coxswain or a crew member.

(v) for new vessels, a fixed fire detection (operated by smoke detectors) and fire alarm system for engine room are to be installed. (Note)

Note

For vessel length of less than 12 m, if regular surveillance can be exercised from outside engine room or control station by the coxswain or a crewmember, these requirements can be waived.

(b) Vessel of L>24 m

same as (a) above but in addition, provided with a fixed fire detection (operated by smoke detectors) and fire alarm system for engine room.

3.15 Any engine fitted on a vessel shall be properly maintained at all time free from dark smoke emission. In this regard, during the final inspection for initial and periodic survey, engine performance condition check would include smoke emission test using Ringelmann Chart. When the dark smoke emitted is as dark as or darker than Shade 2 of the Ringelmann Chart and is emitted for a continuous period of more than 3 minutes, the emission is considered a contravention of the law. (Amended G.N. 1134 of 2017)

3.16 Any vessel if found or reported emitting excessive dark smoke, owners would be requested to present vessel's engine(s) for special inspection and smoke test to ensure compliance. Any non-compliance will be pursued in accordance with relevant legislation requirement.

3.17 Compressed Air System

3.17.1 Suitable pressure-relief arrangements shall be provided to prevent excess pressure in any part of the compressed air systems.

3.17.2 The starting air arrangements for main engine of a cylinder diameter exceeding 300 mm shall be adequately protected against the effects of back firing and internal explosion in the starting air pipes.

3.17.3 The discharge pipes from starting air compressor shall be led directly to the starting air receiver. Starting air pipes from air receivers serving main or generator engines shall be entirely separate from other services.

3.17.4 Provision shall be made to avoid or minimize the entry of oil into the air pressure systems and to drain the oil from the systems.

3.17.5 (1) Construction of air receivers shall meet the standard of a maritime administration's national standard or a classification society, and be subject to the approval of the Director. The air receivers are classified according to the following table:

Class I	Class II	Class III
P > 39.2	39.2 ≥ P ≥ 17.2	P < 17.2
or S > 38	or 38 ≥ S ≥ 16	or S < 16
or T > 350	or 350 ≥ T ≥ 150	or T < 150

where P = maximum design or working pressure (bar)

S = shell thickness (mm)

T = working temperature (^{o}C)

(2) Air receivers of new vessel [Notei] shall be built under the survey of one of the abovementioned maritime institutions, and issued with appropriate certificates.

(3) Each air receiver shall be provided with the following fittings:

(i) Stop valve and pressure gauge

(ii) Drain valve

(iii) Safety valve

(4) The following information shall be submitted in duplicate for approval:

(i) Air receiver construction (including details of welded connections, attachments, dimensions and supports etc.)

(ii) Construction of pressure parts (cylindrical shell, end plates, etc.)

(iii) Arrangement of mountings and fittings

(iv) Mechanical properties of material

(v) Test pressure.

3.17.6 Every air receiver shall be tested at pressure according to the following table:

Type of Construction	Maximum Working Pressure (MWP)	Test Pressure
Riveted or Fusion welded	MWP ≤ 7 bar	2 × MWP
Riveted	7 bar< MWP ≤ 20 bar	1.5 × MWP + 3.5
Riveted	MWP> 20 bar	MWP + 14
Fusion welded	MWP> 7 bar	1.5 × MWP + 3.5

4 Electrical Installations

4.1 The nominal voltage of electrical systems is recommended to be 380V for generation and power circuits, 220V for lighting and distribution circuits and 24V D.C. for low voltage circuits.

4.2 The hull return system shall not be used for power or lighting.

[Notei] A vessel which is a new vessel when the reference to "the commencement date" in the definition of "new vessel" under section 2 of the Survey Regulation is substituted by "3 March 2017".
(Added G.N. 1134 of 2017)

4.3 Permanently exposed fixed metal parts of electrical machines or equipment which are not intended to be “live”, but which are liable under fault conditions to become “live” shall be earthed if they are supplied at a voltage exceeding 50V, except arranged with double insulation internally.

4.4 Electrical apparatus shall be so constructed and so installed that it should not cause injury to person when handled or touched in the normal manner.

4.5 The voltage rating of any cable shall not be less than the nominal voltage.

4.6 Every conductor of a cable or flexible cord shall be capable of carrying the maximum current which will normally flow through it without exceeding the appropriate current rating as specified by the manufacturer of the cable.

4.7 Cable runs shall be selected so as to protect against condensed moisture or drips. Cables shall, as far as possible, be remote from sources of heat, such as hot pipes, resistors, etc., and shall be protected from avoidable risks of mechanical damage.

4.8 Circuits shall be protected against short circuit and overload.

4.9 The current rating of circuit breakers shall not exceed the current rating of the smallest size of cable in the circuit protected by the circuit breaker.

4.10 Lighting fittings shall be so arranged as to prevent temperature rises which could damage the wiring and to prevent surrounding material from becoming excessively hot.

4.11 Accumulator batteries of lead-acid type shall not be located in accommodation spaces. Suitably installed hermetically-sealed accumulator batteries of alkaline type are acceptable to be placed in accommodation spaces.

4.12 In spaces where flammable mixtures are liable to collect and in any compartment assigned principally to contain an accumulator battery lead-acid type, the electrical fittings shall be of an explosion proof type.

4.13 A lightning conductor is recommended to be fitted for a vessel whose hull or mast is constructed of nonconductive materials. The lightning conductor may be connected to a copper plate fixed to the vessel's hull below the light waterline. The requirement is applicable to only non-metallic hull vessels.

5 Pollution Prevention

5.1 Owners and agents are required to comply with the requirements relevant to the MARPOL as follows :

(1) The Merchant Shipping (Prevention of Oil Pollution) Regulations (Cap. 413A) applicable to any pleasure vessel of gross tonnage 400 and above (Refer to Annex 10 of this Code); and

(2) The Merchant Shipping (Prevention of Air Pollution) Regulation (Cap. 413P) applicable to any pleasure vessel (Refers to Annex 7 of this Code).

6 Other Installations and Equipment

6.1 At least one anchor of adequate weight is to be installed with anchor chain of adequate size, length and strength for its intended purpose. Where ropes are used instead of chain cables, the rope's size and strength shall be equivalent to that of chain cable. Except for manual operating type, suitable cable and anchor recovery arrangement or windlass is recommended.

6.2 A repair tool kit for main and auxiliary engines is to be carried.

6.3 No naked fire is permitted to use for cooking or similar activities whenever there is passenger onboard, unless the cooking is done inside a galley fitted with fire protected bulkheads.

(Amended G.N. 1134 of 2017)

7 Alteration

Before making any major alteration of the pleasure vessels, the shipowner/agent/competent surveyor shall follow the requirements of "Instruction to Competent Surveyors No. 2/2010".