



**TECHNICAL REGULATIONS APPLICABLE  
TO SHIPS OF **24 METERS LENGTH OR ABOVE**  
DISPLACING LESS THAN 500 TONS TONNAGE  
AND CARRYING A MAXIMUM OF TWELVE  
PASSENGERS**

Unofficial translation from the original french text



Luxembourg, June 30th, 1993

## **TECHNICAL REGULATIONS APPLICABLE TO SHIPS OF 24 METERS LENGTH OR ABOVE DISPLACING LESS THAN 500 TONS TONNAGE AND CARRYING A MAXIMUM OF TWELVE PASSENGERS**

### **INTRODUCTION**

The provisions of this technical regulation apply to ships 24 meters or more long, the tonnage of which is less than 500 which carry a maximum of twelve passengers and which are entered in the Luxembourg shipping register.

These rules have been drawn up by the Commissariat aux affaires maritimes and complete the provisions of the Law of 9th November 1990, which created a public shipping register in Luxembourg, and of the Law of 9th November 1990 approving certain international conventions in shipping matters.

Only ships that have been classed by a Classification Society recognized in Luxembourg may be entered in the register. The rules of the Classification Societies are applicable to provisions that are not covered by this regulation.

Before they can be registered, applicant ships must be inspected by a recognized Classification Society which will certify that they conform to these regulations. Any request for exemption from applicable international agreements or for derogations from these rules must be indicated on the ship's registration form.

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Only ships that have been classed by a Classification Society recognized in Luxembourg may be entered in the register. The rules of the Classification Societies are applicable to provisions that are not covered by this regulation.

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# CHAPTER 1 GENERAL PROVISIONS

## ARTICLE 1-01: Definitions

- 1 - Commissariat: in the following chapters the term “Commissariat” shall be used to indicate the “Commissariat aux affaires maritimes”.
- 2 - The ship’s living quarters shall include meeting and comparable rooms, alloways, bathrooms and lavatories, cabins, offices and pantries that do not contain any cooking apparatus and other rooms of the same nature. The living quarters shall also include the stairs, companionways and escapes that serve these rooms.
- 3 - The category A engine rooms shall be rooms and escapes leading down to them that contain internal combustion engines used as the main means of propulsion of the vessel, or for any other purpose if their total power is equal to at least 110 Kilowatts.
- 4 - The engine rooms shall be all the category A engine rooms and any other rooms that contain internal combustion engines, generators and electrical machines, refrigerating equipment, ventilation and air-conditioning machinery and any other rooms of a comparable nature and the escapes leading to them.
- 5 - The service areas of the vessel shall include all galleys and pantries containing cooking equipment, store cupboards, storerooms, workrooms other than those located in the engine rooms and any other rooms of a comparable nature, as well as the escapes leading to them.
- 6 - Divisions
  - 6 - 1 Where the words “Steel or other equivalent material” occurs “equivalent material” means any non-combustible material which, by itself or thanks to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable period of exposure to the appropriated standard test (e.g. aluminum alloy with appropriated insulation).
  - 6 - 2 “A30” class divisions are those divisions formed by bulkheads and decks which comply with the following:
    - they shall be constructed of steel or other equivalent material;
    - they shall be suitably stiffened;
    - they shall be so constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test;
    - they shall be insulated with approved non-combustible materials such that the average temperature of the unexposed side will not rise more than 139 °C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180 °C above the original temperature, within the time of 30 minutes.
  - 6 - 3 “F” class divisions are those divisions formed by bulkheads, decks, ceilings or linings which comply with the following:

1. they shall be so constructed as to be capable of preventing the passage of flame to the end of the first half hour of the standard fire test;
  2. they shall have an insulation value such that the average temperature of the unexposed side will not rise more than 139°C above the original temperature, nor will the temperature at any one point, including any joint, rise more than 225 °C above the original temperature by the end of the first halfhour of the standard fire test.
- 7 - Conventions
- 7 - 1 The Solas Convention: international convention for the safety of Life at Sea dating from 1974, as amended.
- 7 - 2 Convention on Load Lines: international convention on Loadlines dating from 1966, as amended.
- 7 - 3 The Marpol Convention: international convention for the Prevention of Pollution by Ships dating 1973, as amended.

#### **ARTICLE 1-02: Field of application**

- 1 - Except where otherwise expressly provided, these rules shall be applicable to vessels carrying a maximum of twelve passengers, having a length that is equal to or greater than 24 meters and a gross tonnage of less than 500 tons, and which are entered in the Luxembourg public shipping register (merchant marine).
- 2 - In the case of vessels carrying more than twelve passengers and with a gross tonnage of more than 500 tons, the provisions of the SOLAS convention are applicable.

#### **ARTICLE 1-03: Inspections**

- 1 - These rules shall be applied for the purpose of the inspection that is carried out prior to entry in the register, as required by Article 61 of the Law of 9th November 1990 setting up a Luxembourg public maritime register.

The inspection report shall be sent to the Commissariat and the application for entry in the register shall indicate, where appropriate, any requests for a derogation from the provisions of this regulation.

- 2 - Ships subject to this regulation shall be inspected in dry dock once every three years, except where the class regulations prescribe more frequent inspections.

This regulation shall be applied during dry-dock inspections.



## CHAPTER 2

### FREEBOARD, STABILITY, DIVISION INTO SUBDIVISIONS AND DISCHARGE

#### ARTICLE 2-01: General aspects of freeboard

- 1 - Without prejudice to any provisions contrary to those set out in this chapter, vessels shall be subject to the convention on load lines, hereinafter referred to throughout this chapter as “the Convention”.
- 2 - The international freeboard certificate shall be issued after account has been taken of the rules of the Convention and the relevant prescriptions of this section.
- 3 - A dry-dock inspection of the hull must be carried out once every three years, in accordance with the Classification Society rules and without prejudice to the provisions of Article 1-03. During this inspection, the water inlets, the rudder, the sterntube and the anchor chains must be subjected to special scrutiny.

#### ARTICLE 2-02: Conditions for assigning freeboard

- 1 - The conditions on which freeboard will be assigned are those of the Convention, as amended or supplemented below.
- 2 - Doors giving access to the interior of closed superstructures, as well as those that protect, whether directly or not, access to areas situated below the freeboard deck, must be permanently attached to the bulkhead. They must be made of steel or an equivalent material, they must be equipped with a closing system that renders them water-tight to storm-water, they must open outwards and they must be capable of being operated from both sides of the bulkhead. The way in which such doors are constructed, reinforced and installed must be designed in such a way that the strength of the whole is equal to that of the unpierced part of the bulkhead.

The door sills must be at least 600 mm higher than the free-board deck. This height may be reduced if the doors are located in a place that is, with reservation, protected from the full force of the sea.

- 3 - Wooden hatch covers are prohibited.
- 4 - The covers used to close the hatches on the freeboard deck and on the superstructure deck must show a satisfactory degree of solidity, rigidity and water-tightness. Such criteria shall be deemed to have been met if the hatch-covers have been constructed in accordance with the specifications of one of the recognized Classification Society.
- 5 - The hatchway coamings must be robustly constructed and must extend to a height of at least 450 mm above the freeboard deck. The height of the hatchway coamings may be reduced, or they may be completely omitted, if it can be guaranteed that the safety of the vessel will not thereby be compromised under any sea conditions.
- 6 - The wind scoops providing ventilation to the compartments situated below the freeboard deck or closed superstructure decks shall have coamings of steel or other equivalent material, robustly constructed and efficiently connected to the deck.

That part of the air-vent pipes for water-tanks, water-ballasts, holds or other areas of the vessel which protrudes above the freeboard or superstructure decks must also be robustly made. Suitable devices for closing these pipes must also be fitted.

The ventilator coamings must also be fitted with devices to close them that are effective and water-tight and which are permanently attached. The minimum height of the coamings of ventilators described above must be:

- 760 mm above the freeboard deck;
- 450 mm above the closed superstructure decks.

Alternative heights for the ventilator coamings shall be acceptable provided the safety of the vessel is not thereby compromised under any sea conditions.

- 7 - The vessel's skylights must be robustly constructed. They include openings that can be closed by water-tight and storm-proof covers that are permanently attached to them in cases where the lowest part of these openings is at a height above the deck of at least 450 mm. In the contrary case the skylights must be of the opening porthole type with an outer porthole.

### **ARTICLE 2-03: Means of evacuation and external disposition of the ship**

- 1 - In the crew's quarters and in all other areas of the vessel other than the engine room in which the crew is normally required to work stairs and ladders must be installed in such a way as to provide a means of rapid evacuation from each such area of the vessel to the upper deck. The normal means of access from the upper deck to a particular area or compartment shall be taken into consideration as constituting a means of withdrawal. The continuity and dimensions of all stairs and ladders that may be used to escape to the exterior of the vessel must be defined.
- 2 - The compartment housing the vessel's propulsion machinery must be served by one main exit and an emergency exit. These two exits must be located as far apart as possible. However, in cases where the length of the compartment in question is less than 6 meters an emergency exit shall not be mandatory.
- 3 - The stairs and ladders leading to the compartment housing the propulsion machinery must be made of steel.

### **ARTICLE 2-04: Sounding pipes and air vents**

- 1 - Measures shall be taken to make it possible to sound the interior of any tanks intended to contain liquids, as well as all compartments of the ship that are not easily accessible at all times.

### **ARTICLE 2-05: Intact stability**

- 1 - Intact Stability Booklet
- 1 - The intact stability characteristics of the ship must meet the prescriptions of the Classification Society.
- 1 - 2 Information on the ship's stability for the use of the captain must be kept onboard the ship at all times.

## 2 - Stability tests

2 - 1 A plan showing the draughts or the position of the draught marks must be sent to the Commissariat.

## 2 - 2 Inspection reports and ships' files

All safety inspections of a ship must be reported on in writing. In the event that the report should include recommendations concerning respects in which aspects of the vessel's safety measures should be brought into line with the regulations, such recommendations should be accompanied by deadlines for the implementation of these recommendations that are as short as possible and checks should be carried out to ensure that they have been implemented.

These reports shall be copied to the Commissariat. They shall constitute part of the vessel's safety file, which shall, in addition, include: the declaration of the laying of the keel, all minutes approving the ship's plans, all correspondence concerning the ship, copies of the latest safety certificates issued, which must be kept onboard the ship or in any other place notified to the Commissariat in the application for entry in the register.

2 - 3 The computer calculations assigning the freeboard, the hydrostatic data and, the intact stability data, duly initialled by the Classification Society, that issued the freeboard certificate, must be supplied to the Commissariat.

2 - 4 Ships must undergo a stability test, once they have been completed and, as far as practically possible, with the life-boats and other life-saving equipment in place, in order to determine the actual displacement in the light condition and the coordinates of the center of gravity.

2 - 5 The stability test must be carried out, and its results analysed by an approved surveyor, specifically appointed by the shipyard or the shipowner. It must be carried out in presence of a representative of the Classification Society which issued the freeboard certificate.

2 - 6 The stability test must be carried out whilst observing all the customary precautions so as to obtain results that are as accurate as possible: these precautions concern, in particular, weather conditions at the time of the test, the position of the vessel, the way it is moored, the location and distribution of weights to be removed or added and the installation of life-saving equipment.

Movable weights must be carefully weighed in the presence of a representative of the safety center, or a certificate stating the number of such weights and their weights must be supplied by an approved body.

The bunker tanks or the water tanks must be sealed so as to prevent any liquid from flowing from the one to the other during inclination of the ship. Special attention shall be paid to the setting up of the measuring device. If a pendulum is used it shall not be less than 3 m long and shall be set up, as far as ever possible, inside the vessel. Excessively rigid suspension cords may not be used.

2 - 7 The vessel must be inclined from the perpendicular four times, each such test leading to an angle of heel of at least two degrees and not more than three degrees. This effect should not be obtained by moving the liquid inside the vessel. However, a stability test consisting of two inclinations only may be accepted when the weather and measurement conditions specified in 2-6 above are not such as to give rise to any observations.

- 2 - 8 The test provides the means for determining the displacement and the coordinates of the vessel's center of gravity in the state in which it is at the moment of the test.

The displacement, the center of gravity in the light condition and the trim of the vessel shall be determined on the basis of the data resulting from the test, after making the corrections corresponding to any foreign weights to be deduced and any absent weights to be added. These weights must be determined as accurately as possible, in terms of value and position, at the time the test is carried out.

- 2 - 9 The person in charge shall analyse the results of the stability test and draw up a written report on the test giving the corresponding results and calculations.
- 2 - 10 The results obtained must agree to an extent that is considered acceptable with the data, displacement and position of the center of gravity set out in the provisional stability file before this latter can be considered final. In the contrary case, and in particular when the GM established during the test is less than the provisional GM less 10%, or when the increase in the displacement is greater than 10%, the stability file must be recompiled using the data, displacement and GM actually observed during the test.
- 2 - 11 In the event that a ship should undergo design modifications that have the effect of modifying its stability data, a new test must be carried out and, where appropriate, a new file must be forwarded to the Commissariat.

#### **ARTICLE 2-06: Division into compartments**

- 1 - All vessels must have a water-tight collision bulkhead placed at a distance from the forward perpendicular equal to between 5 and 10% of the total length of the ship. However, there is no requirement for this distance to be less than 2 meters.
- 2 - The engine compartment must be water-tight.
- 3 - The water-tight bulkheads must reach the level of the free board deck.

#### **ARTICLE 2-07: Drainage**

- 1 - All ships must be fitted with equipment or devices for the evacuation of water from all compartments so as to drain them completely.
- 2 - Measures shall be taken to ensure that the water in a given compartment is free to flow to the suction point (s) provided.

## CHAPTER 3

### THE ENGINES

#### ARTICLE 3-01: General provisions

- 1 - The engine installations shall be designed and set up in such a way as to ensure the proper functioning of the ship's instruments.
- 2 - The number and the power of the auxiliary engines that are indispensable for the functioning of the ship's engines shall be such that in the event of a breakdown of any one of them the ship's engines will still be capable of operating at half-power or of propelling the ship at a minimum speed of 7 knots, except in cases of justified exception to this rule, if the power needed to achieve this speed is less than half-power.

#### ARTICLE 3-02: The rules of the Classification Society

- 1 - In the case of all technical questions not covered by this chapter, the rules of the recognized Classification Society shall be applicable.

#### ARTICLE 3-03: Reverse thrust

- 1 - In all ships the power developed during reverse thrust must be sufficient to ensure that effective control of the vessel can be retained in all normal circumstances.
- 2 - Sea trials should be carried out to show that the propulsive system allows the thrust of the propeller to be reversed within a suitable period of time so as to bring the vessel to a stop within a reasonable distance when it is proceeding full speed ahead.

#### ARTICLE 3-04: Protection against noise

- 1 - Steps must be taken to reduce the effects of noise on engine room personnel to a satisfactory level. There should be 2 sets of ear-muffs on board.

#### ARTICLE 3-05: Pipes and instruments under pressure or at high temperatures

- 1 - The pipes for the venting of the exhaust gases from the engines must consist of a minimum number of joints, flexible metal sections or expansion joints.
- 2 - Pipes coming from and to the engines shall be easily identifiable, either by appropriate labels placed on their attachments or by indications painted in the traditional colors, as defined by the standards at present in force. Pipes conveying liquid fuel must be distinguished using the traditional colors.
- 3 - The closing devices shall be equipped with labels indicating which instruments and circuits they serve, unless their distribution around the vessel is such that there can be no doubt as to which instruments and circuits they serve. Labels written in French must not be attached to moving components, such as the hand-wheel or the operating gear of the systems in question.

### **ARTICLE 3-06: Storage and use of liquid fuels**

- 1 - The air pipes from the compartments and from the fuel tanks must terminate in a goose neck equipped with a cap made of fine-mesh wire gauze and a removable closing device. There must be a hole of 5 to 6 mm in diameter in this latter device.

The closing device may be replaced by a system such as an automatic ball-valve if that can offer an equivalent guarantee of reliability.

### **ARTICLE 3-07: Receptacles for storing liquid petroleum gas (LPG)**

- 1 - Receptacles for storing LPG should consist of cylinders of a standard type or of a type approved for use in land-based installations.
- 2 - These cylinders shall be equipped with a closing tap and a pressure valve. The pressure valve shall be of a standard type or of a type approved for use in land-based installations.

### **ARTICLE 3-08: Installations of a special type**

- 1 - The Commissariat may require the application of appropriate rules to the case of any installation of a type not provided for this chapter and which may impinge upon the safety of the vessel or that of any persons on board. This will be the case, in particular, for all installations including components, reservoirs or pipes containing dangerous fluids or fluids subject to high pressure or temperature, provided that such installations are of reasonably developed dimensions.
- 2 - These prescriptions must take account of the nature and type of the installation in question, as well as of its characteristics and the degree of safety it is required to offer in the varying circumstances in which it is operated.

### **ARTICLE 3-09: Plans and documents showing machine installations**

- 1 - The plans and documents that must be available on ships are specified in Article 6-09.

### **ARTICLE 3-10: Plan of the drainage installation**

- 1 - On board of each ship a plan of the drainage installation must be posted up in a part of the ship where all qualified personnel can consult it without difficulty.

## CHAPTER 4

### FIRE PROTECTION

#### ARTICLE 4-01: Fire prevention

- 1 - Paints, varnishes and other substances based on nitrocellulose, or any other highly inflammable products, may not be used.
- 2 - Precautions shall be taken to ensure that combustible materials or vapours may not come into contact with parts of the ship that are liable to be heated to high temperatures. In particular:
  - 2 - 1 Measures shall be adopted to ensure that sparks or flames deriving from smoke conduits, such as those attached to cooking or heating apparatus, cannot find their way into the ventilation ducts.
  - 2 - 2 Measures shall be adopted to insulate the fuel bunkers, the ship's living quarters and service areas, and any vertical surfaces that are heated to high temperatures, such as the smoke conduits, venting pipes or kitchen chimneys.
  - 2 - 3 Apparatus involving a naked flame or an unprotected heating element may not be used for lighting or heating purposes on board.
  - 2 - 4 Electric radiators must satisfy the requirements of Article 5-18 of Chapter 5.
- 3 - Insulating materials must be approved by the Classification Society.
- 4 - The permanent installation of combustible materials at a distance of less than 60 cm from items of equipment such as ovens and furnaces shall be prohibited except where special precautions have been taken to insulate them.
- 5 - Materials which are susceptible to heat must not be used in the manufacture of scupper pipes and discharges on the ship's side which emerge near the water line, or in the construction of fittings which, if destroyed by fire, would give rise to the risk of flooding.
- 6 - Pipes carrying oil or liquid fuel shall be made of steel or other materials that have been duly authorized taking the risk of fire into account.
- 7 - Airpipes from tanks that contain liquid fuels must be equipped with an effective fire-resistant screen that can easily be cleaned and which does not appreciably reduce the usable section of the venting pipe and must satisfy the requirements of paragraph 6 above.
- 8 - The other openings giving access to the engine rooms must be capable of being sealed off from outside.
- 9 - The horizontal and vertical divisions (decks and bulkheads) separating off the class A engine rooms must, as a minimum, be:
  - of type A 30 in the case of ships built of steel or an equivalent material, including aluminum alloys
  - of type F in the case of ships built of combustible materials.



Bulkheadings made of

- sheet steel covered with a 50 mm layer of rock wool, or
- a sheet aluminum alloy covered with a single layer of 80 mm, or two layers of 40 mm with uncrossed joints, of rock wool, may be considered to be equivalent to type A 30 bulkheads.

Bulkheads consisting of an inflammable surface covered with a 100 mm layer of rock wool, or with two layer of 50 mm each with uncrossed joints, may be considered to be equivalent to type F divisions. The rock wool must have a minimum volumetric mass of 96 kg/m<sup>3</sup>. The outer surface of the rock wool must be suitably protected against any splashing with fuel oil and other inflammable liquids.

- 10 - Insulation should extend downwards from the deck on the outer shell of the vessel, to a height of 500 mm in the case of a ship made of steel and down to the light water line in the case of a ship made of any other material.

Stairs that serve several decks must be surrounded by a casing bulkhead made of steel or of an equivalent material, or of type F.

- 11 - In the case of type F divisions, the bulkhead surrounding the category A engine rooms must be smoke-excluding.
- 12 - The bulkhead must only evince the characteristics of a type A 30 or F division, according to the case, in respect of a fire that breaks out in the engine room.
- 13 - The doors and other devices for closing other openings in the bulkheads must be constructed in such a way not to prejudice the structural integrity of the bulkheads into which they have been let.
- 14 - The casing bulkheads of the kitchens shall be made of steel or an equivalent material, or shall be of type F.
- 15 - Stairs, companionways used as runs etc shall above a basic structure of steel and, in cases where they serve several decks, they must be protected by a steel surround, or one made of an equivalent material, or a type F material.
- 16 - Pipework, ducts and operating gear that pass through a fire-resistant bulkhead should not be such as to reduce the bulkhead's resistance to fire.

#### **ARTICLE 4-02: Fire extinction using water under pressure**

- 1 - Any fire extinguishing network using water under pressure which it is intended to install in implementation of the provisions of this chapter shall consist of pipes powered by one or more pumps and serving spraying nozzles, via hydrants and hose-pipes.
- 2 - Fire pumps
- 2 - 1 Except where otherwise provided for in this chapter, fire pumps shall be mechanically powered by motors that are independent of the ship's propulsion system.
- 2 - 2 The bilge pumps and water ballast and drainage pumps, as well as the general service pumps, may be considered to be fire pumps provided that they are not normally used for the purpose of pumping fuel oil.



- 2 - 3 The fire pumps shall be equipped with safety valves if they are capable of exerting a pressure that is greater than the pressure which the pipework and its fittings have been designed and tested to cope with.
- 2 - 4 Each mechanically powered pump must, where the installation of such a pump is provided for in this chapter, be powerful enough to produce, under fire-fighting conditions and at the pressure specified in paragraph 3.2., a flow of water that is at least equal to two thirds of the regulation flow of a drainage pump.
- 3 - Fire-fighting system
- 3 - 1 The diameters of the pipes comprising the fire-fighting system shall be calculated in such a way as to allow the effective use of the maximum flow of a fire pump.
- 3 - 2 Where a fire pump is pumping the quantity of water specified in section 3-1 above to any contiguous fire hydrants a pressure of at least 0.2 N/mm<sup>2</sup> must be maintained at the fire hydrants in question.
- 3 - 3 The layout of the fire-fighting system must be such that it is able to supply water very rapidly. The operating equipment must be easy to use and easily accessible.
- 4 - Pipes and fire hydrants
- 4 - 1 The number and the distribution of the fire hydrants must be such that a one jet of water at least is able to reach any point of the ship that is normally accessible to the crew while the vessel is at sea.
- 4 - 2 The pipes and the fire hydrants shall be such that the hoses can easily be connected to them.
- 4 - 3 Taps or valves shall be mounted on the pipelines in such a way that any one of those can be disconnected whilst the pumps are in use and so that the pumps can continue to supply water to hoses connected to other fire hydrants.
- 4 - 4 Rot-proof materials the properties of which are easily impaired by heat may not be used in the manufacture of the fire-fighting system pipes, except where they have been suitably protected against heat.
- 5 - Hoses and nozzles
- 5 - 1 The fire hoses shall be made of approved materials. They may not be more than 20 meters long, nor may they be longer than half the length of the ship, but there shall be no requirement for them to be shorter than 10 meters. The hoses shall be equipped with the necessary connections and fittings.
- 5 - 2 In the crew's living quarters, in the service quarters and in the engine rooms a hose shall be supplied for each fire hydrant installed in implementation of the provisions of this chapter and shall be kept permanently attached to it. On open decks there shall be no requirement for a separate hose for each hydrant, but the number of hoses installed shall be sufficient for the jet of water prescribed in this article to be supplied in the area in question under all circumstances.
- 5 - 3 The fire hoses and their fittings shall be kept permanently ready for use.
- 5 - 4 The diameter of the exit holes in the nozzles (full jet) shall not be less than 12 mm.
- 5 - 5 All nozzles shall be equipped with a device for halting the jet of water.



## **ARTICLE 4-03: Mechanism for extinguishing fire with extinguishing gas**

- 1 - The use of an extinguishing agent that emits toxic gases, either spontaneously or under specific operating conditions, in quantities that are dangerous for the persons on board shall not be permitted. The operation of the extinguishing system should only be possible as a result of a deliberate manual intervention.
- 2 - The pipes that convey the extinguishing agent to the protected areas must be equipped with directional sections for which
  - the areas to which the pipes lead are clearly indicated,
  - the open and closed positions can easily be checked, and
  - opening and closing is only possible on the spot (no remote control).

The mechanisms for operating the extinguishers may be remote controlled; in that case they shall be operated, from the area of the vessel in which the extinguisher is stored, except in the event that the latter should be stored within a protected area of ship.

The pipes shall be laid out in such a manner as to ensure that the gas is efficiently distributed. They shall be tested to the standards laid down by an approved Classification Society.

All apertures through which air may enter or gas may escape from a protected area shall be closed by appropriate mechanisms. The ventilation system for the protected area must be automatically shut off before the extinguishing agent is pumped in.

- 3 - Periodic checks shall be carried out on the percussive systems for operating the extinguishers, on the section mechanisms, on the quantity of gas available and on the general state of the installation.

Appropriate means of blowing down the pipes without risk, downstream of the directional valves and in both directions, shall be installed.

A suitable system for checking the quantity of gas in the tanks without risk shall be installed.

- 4 - For the purpose of determining the quantity of gas, in the event that the safety valves or other safety devices belonging to the starting air bottles of the pump motors shot emit gases, the gross volume that must be taken into account for the purpose of calculating the minimum concentration of gas should be increased by the volume of free air corresponding to these bottles.
- 5 - Whenever the extinguishing agent is pumped into any part of the ship where the crew normally work or to which they normally have access this fact shall be signalled by an audible signal. It should be connected to the ship's emergency power supply and should be distinct from all other alarm signals. The period of time between the moment the alarm is sounded and the arrival of the gas in the protected area should be such as to permit the evacuation of any crew members present in the protected area. The proper functioning of the mechanism must be periodically checked.
- 6 - The controls used for operating any fixed gas fire extinguishing system must be easily accessible, easy to operate and grouped together in places where there is no risk that they may be cut off by fire in the protected area. They must also be accompanied by clear operating instructions in the interest of the safety of the crew.

- 7 - If several parts of the ship are protected by the same installation, the quantity of gas must be sufficient for the largest of these areas. A group of several enclosed spaces that are not completely separated from each other shall be considered to constitute one single area.
- 8 - Any tanks that are under pressure must be declared satisfactory by the Classification Society.
- 9 - Reservoirs containing extinguishing gas under pressure must not be located to the fore of the collision bulkhead. Such reservoirs must be located in parts of the ship that are specifically reserved for that purpose, must be in secure and easily accessible positions and must be properly ventilated. Access to such areas of the ship should preferably be from the weather deck and, in any case, by an entrance that is independent of the protected parts of the ship. Doors giving access to these areas must open outwards. Bulkheads, decks and access doors that separate such areas structurally from adjacent closed areas must be made of steel or an equivalent material or must be of type F, except in the case of vessels that are less than 35 meters long when such reservoirs are installed above the freeboard deck.
- All doors giving access to rooms containing extinguishing agent reservoirs must indicate the type of agent stored therein and must bear the warning "DANGER!" in large and easily legible type.
- 10 - After a fire has been extinguished, the air in the protected area must be renewed within a period of time that is compatible with the safety of the vessel.
- 11- In the case of the engine rooms, the quantity of carbon dioxide conveyed by the pipes must be sufficient to supply a volume of free gas equal at least to 30% of the gross volume of the largest protected engine room. The volume occupied by free carbon dioxide shall be calculated at the rate of 0.56 m<sup>3</sup>/kg. The pipework must be such that it is capable of supplying 85% of the prescribed volume of gas in less than two minutes.

#### **ARTICLE 4-04: Engine rooms - Fixed fire extinguishing systems using diffusion jets of water under pressure**

- 1 - Any system for projecting jets of water under pressure in the engine rooms must be equipped with diffusion jets of an approved type.
- 2 - The number and the layout of the diffusion jets must be considered satisfactory by the Classification Society and must also ensure an effective average distribution of the water at the rate of at least 3-5 meters per square meter and per minute when the height below the deck of the area to be protected is less than 2.5 meters.
- 3 - The installation may be divided into sections, the distribution valves of which must be capable of being operated from easily accessible positions situated outside the protected areas and which are not subject to any risk of being rapidly cut off by a fire in the protected area.
- 4 - The pump should make it possible to supply water, simultaneously and at the requisite pressure, to all sections of the system in any of the areas of the vessel that are to be protected. The pump and its controls must be located outside the area or areas to be protected. There should be no risk of the mechanism's being rendered inoperable in the event that a fire should break out in the area or areas which it is supposed to protect.

- 5 - The pump may be powered by an independent internal combustion engine. On the other hand, it should operate on energy supplied by the emergency power supply provided for in the Article 5-15, the said power supply must be easily accessible and easy to operate in the event of the failure of the main source of electrical power on the ship. Should the pump be powered by an independent internal combustion engine, this latter should be installed in such a manner that a fire in the protected area will not jeopardize the supply of air to it.
- 6 - Precautions must be taken to ensure that the exit holes of the diffusion jets may not become blocked by impurities in the water or by the corroding of the pipes, spray nozzles or sections of the pump.

#### **ARTICLE 4-05: Protection against fire**

- 1 - Extinguishing fires using water under pressure
- 1 - 1 There must be a fire-fighting network on board the vessel corresponding to the provisions of Article 4-02.
- 1 - 2 The fire-fighting network shall be supplied with water by a main pump located in the main engine room and an autonomous auxiliary pump located outside the main engine room; these two pumps must satisfy the requirements of Article 4-02.
- 1 - 3 In the case of vessels which are less than 35 meters long, the main pump may be connected to the ship's engines, in which case there must be a suitable decoupling mechanism.
- 1 - 4 In the case of vessel with multiple hulls with two independent engine rooms, it will be permissible for the main pump and the auxiliary pump cited in paragraph 1 - 2 to be replaced by two fire pumps, each of which is connected to a separate engine, is capable of being decoupled and supplies a flow of water to the same fire-fighting network.
- 1 - 5 In addition to the hose and nozzle mentioned in paragraph 1-6, there shall also be at least three other hoses with nozzles on board.
- 1 - 6 A fire hydrant to which a hose equipped with a nozzle has been permanently attached shall be installed in the engine room.
- 2 - In addition to the provisions laid down in paragraph 1 , all areas of the ship containing internal combustion engines used to propel the ship must be equipped, to the full satisfaction of the Classification Society, with one of the following fixed fire extinguishing devices:
  - a fire extinguishing device using gas corresponding to the provisions of Article 4-03;
  - a fire extinguishing device using sprinkler jets of water under pressure corresponding to the provisions of Article 4-05, paragraph 1.

#### **ARTICLE 4-06: Fire extinguishers**

- 1 - The ship's fire extinguishers shall be of a type approved by a maritime authority.
- 2 - One of the extinguishers that are intended to be used in a given room or area of the ship must be placed near the entrance to the room or area in question, preferably outside.

- 3 - The number of different makes of fire extinguisher installed on board a given ship must be as small as possible.
- 4 - To the extent that the fire extinguishers installed on the ship can be re-used, an adequate number of refills must be kept on board.
- 5 - The number and the distribution of the portable fire extinguishers installed on the ship must satisfy the following requirements:
  - 5.1 - In all category A engine rooms there must be at least two portable fire extinguishers capable of extinguishing a fire caused by inflammable liquid. In the event that these rooms should house engines with a total power of not less than 250 KW, or boilers containing inflammable liquid, there should be at least one extra extinguisher.
  - 5.2 - In all the various areas of the vessel comprising safety stations, the crew's living quarters and service areas there should be available an adequate number of portable fire extinguishers so that at least one extinguisher of the appropriate type is ready for use in any part of these areas of the vessel; this number may not be less than three.

#### **ARTICLE 4-07: Fire-fighting equipment**

- 1 - The following equipment shall be installed on ships:
  - breathing apparatus of an approved type, of face-mask sort with an external source of air, on the deck, fitted with a tube made of a material with a low index of inflammability and of sufficient length;
  - a torch light;
  - a pair of gloves made of material with a low inflammability index;
  - a life-line;
  - a staving-in tool;
  - a hard hat (safety helmet).

#### **ARTICLE 4-08: Fire-fighting instructions**

- 1 - Fire-fighting instructions shall be kept in an easily accessible place on board all ships.

#### **ARTICLE 4-09: Readiness for immediate use of fire-extinguishing apparatus**

- 1 - All equipment for extinguishing fires must be kept in good working order and ready for immediate use at any moment. The apparatus and installations shall be subjected in turn and at least once a year to periodic tests to ensure that they are in good working order, or to special tests according to the type of apparatus or installation concerned. The date and purpose of such examinations shall be entered in a maintenance and testing register, and the fact of such checks shall be mentioned in the ship's log.

## **ARTICLE 4-10: Equivalence**

- 1 - Each time that 'a specific type of equipment, apparatus or fire-extinguishing agent or device is provided for this chapter, any other type of equivalent equipment may be authorized by the Commissariat.

## **CHAPTER 5**

### **ELECTRICAL INSTALLATIONS**

#### **ARTICLE 5-01: Rules of the Classification Society**

- 1 - For all technical questions that are not specifically dealt with in this chapter, the rules of procedure of the Classification Society shall be applicable.

#### **ARTICLE 5-02: Electrical generators**

- 1 - All vessels on which electrical power constitutes the only means of ensuring the continuous supply of the auxiliary services that are indispensable for the propulsion, steering and safety of the vessels in question shall be equipped with at least two sources of electrical power. The power rating of each of these two sources shall be such that it will still be possible to maintain the said services during any period when either of the two sources of energy is not functioning. One of these two sources of energy may constitute the emergency power supply provided for in this Article 5-15 on condition that it also satisfies the requirements of this Article.
- 2 - In the event that the functioning of one of these two sources of electrical power should depend on the ship's engines (a generator connected to the propeller shafts for example) the installation should be designed so that it is still possible to start the ship's propulsion system when the source of electrical power which does not depend on the engines is out of action. In addition, the power supplied by the source of electrical energy that is connected to the ship's engines must, under all sailing conditions, be adequate to ensure maintenance of all the auxiliary services that are indispensable for the propulsion, steering and safety of the vessel.

#### **ARTICLE 5-03: Type of current. Voltage**

- 1 - The electrical current may be direct or alternating.
- 2 - The terminal voltage of electrically powered instruments may not exceed the following values:

## 2 - 1 Direct current:

Motive power	500 volts
Lighting and household appliances, power points	250 volts
Heating	250 volts
Very low voltage appliances (VLV)	55 volts

## 2 - 2 Alternating current

Motive power	500 volts
Household appliances with a power greater than 3 KW (Kitchen, laundry etc)	500 volts
Heating	500 volts
Lighting, remote control and remote monitoring installations, household appliances with a power equal to or less than 3 KW and power points	250 volts
Very low voltage appliances (VLV)	55 volts

### ARTICLE 5-04: Classes of installations

1 - Electrical installations shall be classed in two categories, depending in particular on the greater of the voltages existing under normal operating conditions, as well as between any two of their leads and between one of these latter and the earth:

#### 1 - 1 Category A (very low voltage)

Installations in which the voltage does not exceed 55 volts of alternating or direct current and in which no point of the circuit is earthed.

#### 1 - 2 Category B

Installations in which the voltage does not exceed 55 volts but which do not come into Category A and installations with a voltage in excess of 55 volts of alternating or direct current.

2 - In the case of installations in Category B, the accessible metal parts, which are not normally live of fixed or portable instruments that are part of the ship's equipment must be earthed under the conditions defined in Article 5-05, except where they are separated from the parts that are normally live by reinforced or double insulation.

3 - The use of portable Category B appliances is prohibited in parts of the ship where the effects of humidity are normally to be met with, such as laundries, bathrooms or showers. However, the use in these parts of the ship of portable appliances with a Category B voltage of less than 250 volts of alternating current may be tolerated provided that they are powered by a separation transformer in which the secondary circuit has no point in common with the primary circuit, or with any other circuit, or any point that is



earthed; such a circuit must moreover be of limited extent. Portable appliances that are part of the ship's electrical equipment and are intended to be used in such conditions must have reinforced or double insulation.

- 4 - The installation of any power points other than those that supply current at a Category A voltage (VLV) or via a separation transformer in accordance with the specifications above shall be prohibited in the parts of the ship concerned.
- 5 - In cases where installations of both categories coexist, the connections of the power points must be different and the voltage used must be indicated by a label.

#### **ARTICLE 5-05: Earthing of Category B installations**

- 1 - All the uncovered metal parts of engines and electrical equipment which are not intended to be made live but may become live accidentally, such as the mounting or casing of engines or generators or of various electrical devices, measuring instruments or comparable equipment must be earthed. This earthing must be permanent, using suitable conductors attached to the hull or to an earthing point, must be carefully executed and must be protected against any form of deterioration, except where the very disposition of the devices provides an effective guarantee thereof.

In the case of ships built of metal the hull shall constitute the earth.

In the case of ships that are not built of metal, an effective earthing point especially designed for this purpose and permanently in contact with the sea must be installed.

- 2 - Any accessible section of the metal casing or sheathing of the cables, where such exists, must be earthed. The earthing thereof must be carried out in such a way as to satisfy the provisions of Article 5-23.
- 3 - The metal carcasses of portable lamps, tools and similar portable accessories which are part of the electrical equipment of the ship and operate on a Category B voltage must be earthed using a suitable section conductor housed in the power cable, except where equivalent precautions have been taken, such as the double insulation of the appliance in question or the connection thereof to a separation transformer using a secondary circuit of limited extent which has no point of contact with the primary circuit or any other circuit and of which no point is earthed.
- 4 - The power points that are necessary for the purpose of supplying power to the ship's electrical circuit from a shore circuit must be equipped with a built-in earthing point intended to be connected to the shore circuit. The equipment must be designed in such a way that the connection to the earth always occurs first. This power point shall be fitted with a switch and shall be protected against overloads and short-circuits.

#### **ARTICLE 5-06: Distribution systems**

- 1 - The usual distribution systems that may coexist on board one and the same vessel are the following:
  - 1 - 1 Direct current
    - distribution using two insulated conductors



1 - 2 Alternating current

- monophase distribution using two insulated conductors with or without a middle earthing point;
  - triphase distribution with three wires and neutral insulated or earthed;
  - triphase distribution with four wires and neutral earthed or insulated.
- 2 - Any other equivalent power distribution system may be authorized by the Commissariat.
- 3 - In insulated distribution systems a device must be included that constantly monitors the level of insulation of the primary circuit and automatically indicates any fault.

**ARTICLE 5-07: Location of electrical equipment**

- 1 - All electrical equipment must be located in rooms or spaces that are properly ventilated and in which dust, gas or inflammable vapours are not likely to accumulate. If for operating reasons such an arrangement cannot be abided by, the equipment in use must be secured against such risks and must be of an approved type.
- 2 - All electrical equipment must be protected against outside influences in a manner that is suited to its operating conditions, in accordance with the relevant parts of the recommendations of the International Electrotechnical Commission (IEC) .

**ARTICLE 5-08: Plans. Guide marks. Modifications**

- 1 - Guide marks must be placed at various points in the circuits so as to make it easy for the crew to monitor them. Plaques should indicate the type and voltage of the electrical current.
- 2 - No modifications may be made to the electrical installation without the involvement of the proper specialists. Plans stored on board the ship shall be kept up to date in respect of any modifications carried out and the dates on which they were made shall also be recorded on the plans.

**ARTICLE 5-09: Construction and installation of distribution boards**

- 1 - No unprotected item that is live may be installed on the front side of the distribution boards.
- 2 - Where necessary, space at the rear of switchboards is provided. The lateral and inner sides of the boards must be properly protected. The passeway should be wide enough, so that it will be no danger for the personnel. A non-conducting mat or grating must be installed under each board.
- 3 - The main distribution boards shall be installed well away from any inflammable substances and in a position where they are protected against any explosive gases, acid fumes and splashes of water vapour or other liquids. In particular, there must be no piping joints in the vicinity, except where the board has been protected with a suitable form of protection.

### **ARTICLE 5-10: Protection of circuits at the main boards**

- 1 - Each circuit that is connected to the main distribution rods must be protected, at the point of connection, and in respect of each of the poles that are not earthed, against any power surges by a protective device, the nominal calibre of which is appropriate to the conductor section; this protective device must be capable of breaking a current that is at least equal to the intensity of the current it may be required to break in the various eventualities that may be envisaged, bearing in mind the condition of the installations, including short-circuit currents.
- 2 - The protective devices must either be disjunctors or disconnectors, combined where appropriate with fuses that have a high rupturing capacity, either fuse-based circuit-breakers. The use of disjunctors shall be compulsory in cases where the current intensity normally passing through the circuit is equal to or in excess of 300 amps. In the event that fusebased circuit-breakers should be used spare fuses should be provided for.

### **ARTICLE 5-11: Protection of generators**

- 1 - Generators must be equipped with protection against overloads and short-circuits.
- 2 - If several generators are likely to be coupled together, each of them must be protected against any returns of power.

### **ARTICLE 5-12: Protection of circuits at the subsidiary boards**

- 1 - The distribution boards shall include at each outgoing point either a multipolar disjuncteur or a multipolar switch and a fuse circuit-breaker on each insulated pole.
- 2 - However, the switch installed at the outgoing point of a secondary board may be eliminated if the board or the apparatus powered from this outgoing point itself incorporates a circuit-breaker and is located in the same compartment of the ship or on the same deck in the immediate vicinity.
- 3 - The protective devices and any non insulated items through which current is flowing must be accessible only to qualified members of the crew.
- 4 - Circuit-breakers installed on terminal lighting circuits may be singlepole switches in any parts of the vessel that are not damp. The singlepole break should not be on a conductor that is earthed.

### **ARTICLE 5-13: Provisions concerning fire**

- 1 - There must be provision for operating the electric motors powering the engine-room ventilators from outside the engine rooms.
- 2 - The pumps for transferring and moving fuel oil, as well as the fuel oil separators, must be capable of being shut off from a point outside the part of the ship in which such pumps are housed.

## **ARTICLE 5-14: Miscellaneous provisions**

- 1 - The lighting for the ship's engine room must be distributed between at least two separate outgoing points on the main distribution board. However, one of these points may be taken on the emergency supply board.
- 2 - The navigation lights shall be separately connected to a board designed for this purpose only and powered directly from the main board; there shall also be a current reverser installed at the incoming point on the navigation light board by which this latter can be powered by another circuit that may derive from a subsidiary board or the emergency board.
- 3 - In cases where the electric or electro-hydraulic steering gear is made up of two units arranged in such a way that each can operate independently of the other, each should be powered by a cable coming from the main distribution board. However, the use of one of the circuits to power other apparatus may be accepted provided that the apparatus in question is not in use when the vessel is at sea; the adjustment of the protector devices may have to be modified in order to allow the steering gear motors to operate in the conditions specified below. Each of these circuits shall have a sufficient section to power all the motors that may be connected to it and which must function simultaneously in order to satisfy the conditions laid down for the emergency steering gear. Throughout their length these circuits must be kept as far apart as possible. Circuits directly entering and leaving a main board may not power other apparatus.
- 4 - The motors that operate the steering gear and the corresponding circuits must only be protected against short-circuits; in the case of induction motors the protective device must be tripped in the event of the jamming of a rotor. The motors must however be equipped with devices for giving warning of overloads that are dangerous for the maintenance in correct working order of the equipment concerned. Dials indicating that the electric motors powering the steering gear are working, halted or undergoing overload must be installed in the steering stand.

## **ARTICLE 5-15: Emergency power supply**

- 1 - An autonomous emergency power supply must be installed that is capable of continuing for a period of three hours to supply lighting to the launch stations of the life-boats, the embarkation points on deck and the launching points, as well as ensuring minimum internal lighting for safety purposes, the continued operation of the navigation lights, and where it exists, the internal alarm network. In addition, it must, where relevant, provide power to the fixed extinguishing system provided for in Article 4-05.
- 2 - The emergency power supply in question must be capable of operating in conditions of a 30° list, combined or not with a 10° trim. It may consist of:
  - either an accumulator battery,
  - or a generator powered by an internal combustion engine burning a fuel with a flash point higher than or equal to 43°C and stored in a separate tank. The starter motor must offer all guarantees as to its effectiveness.

- 3 - The emergency supply must be installed outside the engine room, in principle above the freeboard deck.
- 4 - All the necessary measures must be adopted to ensure that the functioning of all the emergency installations is tested at regular intervals.

#### **ARTICLE 5-16: Nature and laying of electrical cable ducts**

- 1 - Cable must be of an approved type; in particular, they must be flameretardant and may be composed of one or more conductor wires.
- 2 - Bulk laying of cables should be avoided. Except where it proves impossible to do so, the cables must be mounted in regular layers. The cabling must be supported in such a way to ensure that there is no risk of deterioration through friction or any other cause; if necessary cables must be held in position by clips, if possible made of metal. Except where exceptional circumstances require it, the cable ducts must not be laid on the ship's bottom or in any other place where there is a risk of immersion in water, even if only temporary.
- 3 - Packing boxes or equivalent devices shall be installed at points where the cables pass through bulkheads and water-tight decks.
- 4 - Cables must be protected wherever they are exposed to the risk of bumps or jolts; protection may be provided in the form of sheathing or a metal cowling or any other means that is mechanically equivalent.
- 5 - Splicing of cables is prohibited. Conductors must be joined exclusively on the basis of internal connections if their mode of construction permits it or using junction or derivation boxes made of flame-retardant materials.
- 6 - Accessible coatings and sheathing of cable must where they exist, be carefully earthed.
- 7 - Conductors shall be mounted in such a manner as not to interfere with the electric compasses or other electric and electronic apparatus.

#### **ARTICLE 5-17: Small accessories, household appliances - power points**

- 1 - Small accessories and household appliances must be adapted for use on board ship; they must comply with the requirements of Articles 5-04 and 5-05 to the extent that they are applicable to them.
- 2 - In category B installations power points that may be used to power appliances that are part of the ship's equipment and which include metal parts that must be earthed must have a terminal for connection to the earth. Appropriate measures must be taken to ensure that such appliances can only be plugged into the corresponding power points. The alignment of the fixed part (plate) and of the moving part (prong) of the power point must be such that the connection of the earthing wire of the power cable of a portable appliance must necessarily occur first and with no risk that the wire itself may become live.
- 3 - Power points supplying a voltage greater than 250 volts must be capable of being shut off using a switch located within the immediate vicinity.
- 4 - In class B installations power points located outside must be of the type that is protected against heavy seas and must correspond to the IP 56 degree of protection specifies in the relevant IEC recommendations.

## **ARTICLE 5-18: Heating apparatus**

- 1 - Electric radiators must be of an approved type. They must be permanently fixed in place and must be built in such a way as to reduce the risk of fire as far as possible. No radiators should be installed which have heating elements that expose clothes, curtains or other similar articles to the risk of smouldering or catching fire under the effect of the heat given off by the element. The use of electric radiators made up of reflectors with an incandescent source of heat is prohibited.

## **ARTICLE 5-19: Provisions relating specifically to certain areas or spaces**

- 1 - Within parts of the ship where mixtures of inflammable gases or vapor are likely to build up (battery stores, for example) no electrical equipment should be installed, unless it is of an approved safety type.
- 2 - In spaces or areas where humidity is normally to be met with, such as bathrooms or showers, the electrical equipment should be installed in such a way that it cannot be reached by anyone who is in contact with water.

## **ARTICLE 5-20: Accumulator batteries**

- 1 - Where such exist, battery stores must be properly ventilated: for this purpose they shall be equipped with high and low ventilation openings which communicate with the open air. It is forbidden to install equipment that may produce an electric arc or sparks in rooms where, batteries are stored or in rooms communicating with them, except where such equipment is of an approved safety type.
- 2 - In cases where they are not stored in rooms specially allocated to that purpose accumulator batteries must be placed in crates equipped with lids. These crates must be capable of preventing any leakage of electrolyte. They must be suitably ventilated in all circumstances. The accumulator batteries must be easily accessible and must be properly held in place so as to eliminate any risk of shifting or breaking under the effect of the movement of the vessel.
- 3 - Small batteries, such as those used in the radio installations, with a charge of less than 0.2 KW, may be stored in the open air or in crates located where they are needed. Measures shall be taken to ensure that no radio equipment or other delicate apparatus may be damaged by the corrosive effect of the gases given off by such batteries.
- 4 - No accumulator battery may be stored in the living quarters of the ship, with the exception of low-capacity batteries which have been sealed to prevent leaks.
- 5 - Suitable means of isolating the batteries shall be installed as close to them as possible.
- 6 - Accumulator batteries must be equipped with a device to protect them against overloads and short-circuits. These devices must be installed on the terminals of the batteries on each pole and ahead of the battery-isolators. If the engines have electric starter motors, the batteries used to power them may not be equipped with overload-protectors. In the cases where the accumulator batteries are used both for starting the engines and for general purposes the protection devices shall be installed to the satisfaction of the Classification Society. The emergency batteries used to power essential services shall be equipped only with protection against short-circuits.

## **ARTICLE 5-21: Internal communications circuits**

- 1 - Internal communications circuits, such as bells, telephones, fire alarms, public address system etc, shall comply with the requirements of Article 5-16. The cables shall be insulated for at least 250 volts. Telephone lines, other than those that are powered by batteries or which are part of an autonomously powered network, shall be equipped with fused circuit-breakers on each terminal at the exit point from the exchange, or with equivalent protective devices.

## **ARTICLE 5-22: Radio communications installations**

- 1 - Radio telegraphy and radio telephony installations shall comply with the applicable specifications set out in Chapter IV of the SOLAS convention.

## **ARTICLE 5-23: Elimination of interference and static of electrical origin**

- 1 - In order to eliminate induction effects that may disrupt the proper functioning of radio communication, navigation and safety instruments, the precautions listed in 2 to 6 below shall be taken.
- 2 - in cases where it proves necessary, electric cable ducts passing through or in the vicinity of rooms that contain instruments of the type described above or their aerials should be of the sheathed type or should be fused and the sheathing or covering should be earthed, in accordance with the requirements of Articles 5-04 and 5-05.
- 3 - Any transformer or generator situated in rooms or areas where there is a risk that it may produce interference and disturb the functioning of these instruments must be screened, or at least placed in a box with definite screening and then earthed or shielded.
- 4 - The metal cores of radio-electric instruments located in such rooms or areas that may produce interference must be earthed.
- 5 - In- addition, all radio-electric instruments other than radio communications apparatus or safety or navigation instruments must, as far as ever possible, be installed in places where they cannot produce interference.
- 6 - All electrical instruments or machines that produce interference that is likely to hinder the proper functioning of the ship's radio communications, safety or navigation instruments must be shielded.

## **ARTICLE 5-24: Test before commissioning**

- 1 - Before the commissioning of the vessel, the insulation of the installations shall be checked and the necessary adjustments shall be made. The results of these checks and adjustments shall be entered in a special register kept on board the vessel. The correct functioning of the instruments shall then be tested.

## **ARTICLE 5-25: Periodic tests**

- 1 - Periodic tests of the insulation of the installations shall be carried out, sector by sector, in such a way that the installations in their entirety have been tested at least once every five years.

The results of these tests shall be entered in the special register mentioned in Article 5-24.

## **CHAPTER 6**

### **SAFETY AT SEA**

#### **ARTICLE 6-01: General provisions applicable**

- 1 - Ships that are subject of these regulations must abide by the applicable parts of the rules set out in Chapter V of the SOLAS convention, except in so far as these latter do not concern the type of navigation in which they are engaged or are not compatible with the installations on board the ships in question.

#### **ARTICLE 6-02: Steering**

- 1 - On all vessels visibility from the wheelhouse must be satisfactory. From the point where the helmsman stands, the view of the surface of the sea ahead of the bow should not be obstructed for more than two lengths of the ship. The forwardpart of the ship must be visible from the wheelhouse and the port and starboard sides of the ship must be visible from a point within the immediate vicinity of the bridge.
- 2 - The windows of the bridge or wheelhouse must not be made of polarized or tinted glass. At least one of the windows of the wheelhouse must be equipped with a wiper.
- 3 - The following means of communication must be installed in the wheelhouse, except in cases where the lay-out of the room renders such equipment superfluous:
  - 3 - 1 A voice transmission system providing effective communication with the mooring stations situated at the fore and aft ends of the ship.
  - 3 - 2 A voice transmission system providing communication with the emergency steering gear compartment; a single system may be accepted for the purpose of providing communication with the emergency steering gear compartment and the aft mooring station if it is placed in such a way as to be able to satisfy these two needs.
  - 3 - 3 A voice transmission system providing communication with the radio operator.
  - 3 - 4 A voice transmission system providing communication with the standard magnetic compass and, where appropriate, with the gyroscopic compass.
  - 3 - 5 A voice transmission system providing communication with the Captain's cabin.
- 4 - A device for controlling the steering gear must be installed in the wheelhouse. A rudder angle indicator must also be provided for.



### **ARTICLE 6-03: The magnetic compass**

- 1 - Ships must be equipped with a steering compass and the means for taking bearings.
- 2 - Magnetic compasses must be of an approved type. They must be properly adjusted and a deviation card showing the residual deviations must be kept on board.
- 3 - No magnetic substance may be located in the horizontal plane at a distance of less than one meter from the center of the bowl of the standard magnetic compass. In the event that it should prove impossible to satisfy this requirement, the compass must either be placed outside the wheelhouse or mounted to the ceiling, so as to ensure that it continues to function effectively.
- 4 - If there is only one compass on board, a spare magnetic compass bowl that is interchangeable with the one in use must be kept on board.
- 5 - In cases where a ship is equipped with a magnetic compass with a repeater, the whole unit must be powered by an emergency power source. Suitable lighting with a device for reducing the intensity must be installed to ensure that it is always possible to read the card. If this lighting is powered by the ship's main source of electrical power, emergency lighting must be provided.
- 6 - Ships that are equipped with emergency control units for the steering gear must also be equipped with at least one telephone or other means of telecommunications by which information on the heading can be transmitted of these stations.

### **ARTICLE 6-04: The gyroscopic compass**

- 1 - If there is a gyroscopic compass on board it should, where appropriate, be fitted with repeaters so as to make it possible to steer the vessel and take bearings.
- 2 - All gyroscopic compasses must be of an approved type.

### **ARTICLE 6-05: Use of the automatic pilot**

- 1 - In cases where the ship is navigating on automatic pilot in areas where there is a high density of traffic and in circumstances of reduced visibility, as well as in all other-delicate navigating conditions, it must be possible to take control of the ship immediately using the manual steering.
- 2 - Manual control of the rudder must be tested after any period of prolonged use of the automatic pilot and before entering any area in which navigation requires special attention.
- 3 - All automatic pilots must be of an approved type.

### **ARTICLE 6-06: Signalling systems to prevent collisions at sea**

- 1 - Vessels must be fitted with navigation lights and other visual and sound-based signalling devices that are laid down by the Regulation for Preventing Collisions at Sea and which are applicable to the type of ship concerned. All navigation lights, as well as the soundbased signalling devices, must be of an approved type. The way in which they are installed on board the ship must satisfy the requirements of the Regulation for Preventing Collisions at Sea.



- 2 - When the electric navigation lights mentioned above are not fitted with two sources of light, emergency electric navigating lights must be installed. These emergency lights are only required for the mast lights, the side lights and the stern lights.
- 3 - The navigation lights shall be controlled from a lighting panel installed in the bridge or at the wheelhouse and equipped with switches and a correct functioning indicator light.

#### **ARTICLE 6-07: Signalling lamps**

- 1 - All ships with a gross displacement of more than 150 tons engaged in international voyages must have an effective signalling lamp for signalling by flashing (Aldis) on board which must not be powered exclusively by the ship's main source of electric power.

#### **ARTICLE 6-08: Radar. Radar reflectors**

- 1 - Ships must be fitted with a radar of an approved type.
- 2 - Ships which have no material in their structure capable of producing an adequate echo must be fitted with a device for reflecting radar waves of an effective design.

#### **ARTICLE 6-09: Plans and documents kept on board**

- 1 - All ships must have the following plans and documents:
  - a general arrangement plan of the ship;
  - a plan or layout of the vessel's capacities;
  - a loading plan;
  - the trim and stability books;
  - a plan of the engines;
  - a plan or a layout of the drainage pipes;
  - a plan or a layout of the steam and fuel oil pipes;
  - a plan or a layout of the electrical installations;
  - a plan or a layout of the fire-fighting equipment.
- 2 - The symbols used in these documents must be in line with current standards, except where the meaning of the symbols used is clearly indicated.
- 3 - The information required in one or more of the above indents may be combined in a single document, provided that the clarity and legibility of the resulting document are not adversely affected by such an arrangement. The plans and other documents must state their origin and the date on which they were drawn up.

#### **ARTICLE 6-10: The ship's log**

- 1 - Every ship must have a ship's log which is signed each day by the captain. The bridge logbook, the engine-room logbook and the radio operator's logbook together constitute the ship's log.

- 2 - All facts concerning the ship's safety, in all circumstances, must be entered in chronological order in the bridge logbook, as well as weather conditions and all events that concern the safety of life at sea. Information concerning the steering of the vessel and constant adherence to the dead-reckoning positions should be accurately recorded in the log.
- 3 - The engine-room logbook shall be kept under the authority of the chief engineer. All relevant facts concerning the functioning and the maintenance of the vessel's propulsive system and of auxiliary engines shall be recorded therein in chronological order. Ships that have equipment for the automatic recording of the information that is to be recorded in the engine-room logbook shall not be required to enter this information in the engine-room logbook. In cases where the effective power in continuous running of the engines is less than 300 KW there shall be no requirements for an engine-room logbook but in that case the captain shall enter in the bridge-logbook the main facts concerning the running of the engines which the chief engineer is required to report to him.
- 4 - These logbooks shall also be used to record information and miscellaneous details concerning safety, work and discipline on board.

#### **ARTICLE 6-11: Mooring installations**

- 1 - All vessels which have received the highest class by an approved Classification Society, or which are equipped with mooring gear that is considered to be acceptable by a Classification Society, shall be considered to comply with the regulations.

#### **ARTICLE 6-12: Nautical equipment, instruments and documents**

- 1 - Tables 1,2 and 3, which are annexed to this chapter, set out the nautical equipment, instruments and documents which all vessels must have on board.

#### **ARTICLE 6-13: Commissioning equipment**

- 1 - The conditions for the use of the machinery and any other mobile equipment that may be potentially dangerous in any way for the crew and the ship itself, bearing in mind the use to which it is put, its location or its particular structure, must be specified in instructions laid down by the captain.
- 2 - Under the same conditions, any prohibition of smoking or striking a naked flame in certain parts of the ship must be subject to special instructions, which shall be posted up in public.
- 3 - All vessels must be fitted out with mooring equipment, such as bollards and fair-leads, and must be equipped with ropes, hawsers and tow-lines so that they can, where necessary, receive assistance when in difficulties.

## ANNEX 1 \*

\* Derogations from the rules may be granted to ships sailing in certain restricted and limited navigation zones.

**TABLE 1 - NAUTICAL INSTRUMENTS**

Objects	Observations
1 chronometer indicating at least seconds *	
2 protractors *	or equivalent instruments
2 two-point compasses	
2 binnacle chronometers	1 on the bridge indicating periods of silence and 1 in the engine room *
or	
1 central clock with a time distribution system	
1 barometer	A second barometer is required on board ships traveling more than 200 miles from port, one of which must be a recording barometer
2 thermometers *	One in the engine room
1 sextant with accessories *	
1 pair of binoculars	7 X 50. An additional pair is required on ships that travel more than 200 miles from port
1 spare magnetic compass bowl for the steering compass with its suspension rings and magnetic gimbal *	
1 alidade *	
1 set of spares and maintenance equipment for a gyroscopic compass	Of the kind recommended by the manufacturer of the compass
	Where the ship is equipped with a gyroscopic compass or equivalent instrument.

1 log *	
1 sounding line	At least 50 meters long.
1 echo sounder *	This instrument must include a scale of at least 0 to 300 meters.

**TABLE 2 - MISCELLANEOUS EQUIPMENT**

Objects	Observations
6 distress signals of an approved type	These signals must be of the parachute type. They must be stored in water-tight crates within the vicinity of the bridge or inside it.
2 floating smoke-emitting signals of an approved type *	Emitting smoke for a period of not less than three minutes.
1 complete set of code flags and pennants	Ships of category B which have been exempted from keeping the complete set of code signals must have the N and C flags of the international signal code.
1 table of flags and pennants *	This table must be posted up.
1 call sign (flags)	
1 national maritime flag	
2 halyards for flags and pennants *	
1 portable lamp daytime signalling lamp *	In the case of ships that are not equipped with the light specified in Article 6-07. Ships which do not travel more than 20 miles from the nearest landfall must have a light of this kind or an electric lamp that can be used for emitting Morse-code signals.

**TABLE 3 - NAUTICAL BOOKS AND DOCUMENTS**

Objects	Observations
1 set of charts, sailing directions, list of lights and charts showing the traffic separation schemes in the area in which the ship is expected to be navigating	These documents must be entered in the catalogue of nautical charts and books and must be kept up to date
1 tide table *	
1 copy of the International Code Signals	Compulsory on vessels with radio telephony transceiver equipment.
1 nautical almanac *	
1 list of coast radio stations	
Or	
1 list of coast radio stations with which the vessel is likely to enter into communications	On ships which are obliged to operate a radio-telephone
1 manual for the use of the mobile maritime services and the mobile maritime by satellite	
1 seasonal load line chart	Compulsory on ships which change zones
1 copy of the Regulations for Preventing Collisions at Sea (COLREG) currently in force	An illustrated table summarizing the lights and signals which ships are obliged to carry in order to avoid collisions at sea must be posted up.
1 copy of the rescue signals *	An illustrated table of these signals must be posted up
1 copy of the current laws and regulations concerning the safety of maritime navigation *	
1 current international Convention on the safety of life at sea (SOLAS)	Compulsory on ships engaged in international traffic so as to inform the captain of his obligations while aboard.

1 copy of tables for position calculations	On ships equipped with a sextant
1 IMO “Mersar” manual	On ships travelling more than 20 miles from the nearest landfall.
1 copy of the azimuth tables*	

## CHAPTER 7

### RESCUE APPLIANCES

#### ARTICLE 7-01: Provisions of the SOLAS Convention applicable

- 1 - Except where otherwise provided for in this chapter, the rules set out in Chapter III of the SOLAS Convention shall be applicable.

#### ARTICLE 7-02: Number and type of life-rafts and life-boats

- 1 - All ships must be equipped with the following items of rescue equipment:
- 1 - 1 At least two life-rafts of a Class I approved type having total passenger capacity adequate to receive 200% of the total number of persons on board. These life-rafts must be capable of being launched from either side of the ship in sufficient number for them to be able to accommodate at least the total number of persons on board.

In the event that it should not be possible to transfer the life-rafts rapidly from one side of the ship to the other, the total accommodation -capacity of the rafts on each side of the vessel must be adequate to accommodate the total number of persons on board.

The life-rafts must be of an approved Class I type which satisfies the requirements of Rules 39 and 40 of Chapter III of the SOLAS Convention.

- 1 - 2 A motor life-boat of an approved type which is in accordance with Rule 47 of Chapter III of the SOLAS Convention and which is capable of being launched from either side of the vessel, with launching tackle if necessary. However, due account being taken of the dimensions and manoeuvrability of the vessel, as well as the proximity of the existing search and rescue facilities and the meteo alert network, the type of activity the ship is engaged in in zones that are not subject to bad weather, or the seasonal nature of the ship's activity, the Commissariat may accept the installation of inflatable life-boats the length of which is equal to or greater than 3.5 m, which are kept permanently inflated and which are equipped with an outboard motor.

#### ARTICLE 7-03: Availability and stowing of life-rafts and life-boats

- 1 - Life-rafts must:
  - 1 - 1 be promptly available in a moment of crisis.

- 1 - 2 be capable of being launched safely and speedily, even in unfavorable conditions of trim and with a counter-list of 20 degrees;
- 1 - 3 be capable of being rapidly retrieved if they are also suitable for use as life-boats;
- 1 - 4 be stowed on the vessel in such a way that:
  - the mustering of persons at the embarkation stations is not hindered,
  - rapid handling is not impeded,
  - it is possible to embark passengers quickly and in an orderly fashion,
  - they do not hinder the use of other boats or life-rafts.
- 2 - The life-rafts and the apparatus for launching them must be in serviceable condition and ready for immediate use before the vessel leaves port and throughout the period during which it is at sea.

#### **ARTICLE 7-04: Embarkation on to life-rafts**

- 1 - Appropriate steps must be taken to facilitate embarkation on to the life-rafts and provide in particular for:
  - at least one ladder, or any other approved means, on each vessel, to be used for providing access to boats or life-rafts after they have been launched, except where the distance between the point of embarkation and the boat or life-raft in the water is such that a ladder is not indispensable,
  - suitable lighting to light the stowing stations for the boats or life-rafts and the launching apparatus during the stage of preparation for launching and launching, and also to light the surface of the water into which the boats or life-rafts are being launched until the launching stage is complete,
  - an address system to warn all persons on board that the ship is about to be abandoned, and
  - a device to prevent any outfall of water into the boats or life-rafts.

#### **ARTICLE 7-05: Survival suits and life-jackets**

- 1 - Ships putting out to sea for a distance greater than 20 miles from the nearest landfall must be equipped with a survival suit of an approved type for every person on board.

In addition, on the bridge and at the exit from the engine room there shall be one life-jacket of an approved type for each person on watch. The total number of such life-jackets shall not be less than four.

Ships navigating exclusively in tropical waters where the zone is classified as permanently tropical in accordance with the definition given in the 1966 International Convention on Loadlines and its annexes shall not be obliged to carry survival suits but must carry as many life-jackets as there are persons on board, plus additional life-jackets for all the personnel on watch.



- 2 - Ships putting out to sea for distances not greater than 20 miles from the nearest landfall must carry a life-jacket of an approved type for each person on board, plus life-jackets located on the bridge and at the exit from the engine room for all personnel on watch.
- 3 - The places on board the vessel where the survival suits and the life-jackets are stowed shall be indicated on a plan which shall be submitted to the Commissariat for its prior approval.
- 4 - The name of the vessel and its port of registry to which the survival suits or life-jackets in question belong must be printed thereon in visible and indelible lettering.

#### **ARTICLE 7-06: Life-buoys**

- 1 - All ship must be fitted with at least four life-buoys, two of which must be equipped with a light source which is automatically switched on, one of these buoys being also equipped with a smoke signal which is automatically released.  
  
Two buoys, one on each side, must be equipped with a floating lifeline at least 20 meters in length and corresponding to the description in Rule 31 of Chapter III of the SOLAS Convention.  
  
During any period spent by the ship in port or in a roadstead, one of the life-buoys, with a casting-line attached, shall be kept permanently at the gang-way.
- 2 - Each life-buoy must bear, written in visible and indelible lettering, the name and port of registry of the vessel to which it belongs.

#### **ARTICLE 7-07: Line-throwing apparatus**

- 1 - All ships must have a line-throwing apparatus of an approved type which satisfies the requirements of Rule 49 of Chapter III of SOLAS Convention.

#### **ARTICLE 7-08: Distress signals**

- 1 - Ships putting to sea for a distance greater than 20 miles from the nearest landfall must be fitted with at least six parachute flares of an approved type (Rule 35 of Chapter III of the SOLAS Convention), and other ships must have at least three such flares. These flares must be stored in water-tight crates placed within the vicinity of the wheelhouse or inside it. In addition, these ships must have two floating smoke-signals corresponding to the type specified in Rule 37 of Chapter III of the SOLAS Convention.

#### **ARTICLE 7-09: General alarm system in an emergency**

- 1 - In an emergency the general alarm system must be capable of giving the general alarm signal using the ship's whistle or siren and also by means of a bell or horn powered by electricity, or by another equivalent device, which must be powered by the ship's main source of electricity and also by the emergency power supply. It must be possible to give the alarm from the wheelhouse. It must be possible for the alarm signals to be heard in all inhabited areas and in all areas where the crew normally work.



## **ARTICLE 7-10: Muster list and instructions in an emergency, order to abandon ship**

- 1 - A muster list must be drawn up according to duties before the ship puts to sea. If, after the muster list has been drawn up, the composition of the crew changes in a way that requires the amendment of the muster list the captain shall revise it or draw up a new one.
- 2 - The muster list must indicate the duties assigned to the various members of the crew as regards, in particular, the closing of water-tight doors, fire doors and other comparable openings on board, the operation of the boats, rafts and other life-saving equipment, the mustering of the passengers, the use of the radio communications equipment and the special tasks relating to the use of the fire-fighting equipment and installations.
- 3 - The muster list must be posted up in a prominent place in several parts of the ship, and in particular in the wheelhouse and in the crew's quarters.

## **ARTICLE 7-11: Drills and practices**

- 1 - All members of the crew must regularly participate in exercises in abandoning ship and fire drills.
- 2 - During such drills, the life-saving and rescue equipment, the fire-fighting equipment and any other mobile safety equipment must be examined to check that they are complete and in proper working order.
- 3 - In the case of vessels equipped with life-rafts, at least once a year the actual launching of a raft shall be practised. The participation by the crew in collective demonstrations of the use of life-raft may be considered to be equivalent.

## **ARTICLE 7-12: Training and instructions given on board**

- 1 - Training and instructions must be given on board so that the crew are adequately trained. This training concerns the signals, the life-boats, the life-rafts, survival in water and fire-fighting.

# **CHAPTER 8**

## **FITNESS FOR HABITATION**

### **ARTICLE 8-01: General**

- 1 - Ships covered by this set of rules must be designed and equipped in such a way as to offer those on board an adequate degree of habitability.

## **ARTICLE 8-02: Quarters allocated to the crew**

- 1 - The location, the access to, the construction and the layout of the crew's quarters must be such that they can guarantee adequate safety, protection against the weather and the sea and insulation against heat and cold, smells or odours from other parts of the ship and, as far as possible, condensation.

## **ARTICLE 8-03: Ventilation**

- 1 - All inhabited areas shall be properly ventilated. The ventilation system shall be installed in such a form that the flow of air is sufficient in all weathers and in all climates. In particular, it must be such as to provide for a rate of renewal of the air of 6 volumes per hour when all openings in the hull are closed.

## **ARTICLE 8-04: Heating**

- 1 - Depending on the uses for which the ship is intended, a heating system shall be provided for.

## **ARTICLE 8-05: Lighting**

- 1 - All inhabited areas must be properly lit. The lighting system must be designed so as to minimize the risk of an explosion or a fire.

## **ARTICLE 8-06: Bunks**

- 1 - A bunk having minimum internal dimensions of 1.90m by 0.70m shall be provided for all persons on board. Suitable means (anti-roll systems) shall be installed to prevent falls.

## **ARTICLE 8-07: Galley**

- 1 - The ship's galley must be separate from the crew's sleeping quarters and must be equipped for the purpose of preparing meals for all the crew and other persons on board whilst the ship is at sea.

## **ARTICLE 8-08: Sanitary installations**

- 1 - Adequate sanitary installations, consisting of lavatories, wash-basins and showers, must be installed on board all ships.

## CHAPTER 9

### PREVENTION OF POLLUTION BY SHIPS

#### **ARTICLE 9-01 : Ships with a gross tonnage of more than 400 tons**

- 1 - All vessels of more than 400 tons gross tonnage must be equipped in such a way to prevent marine pollution, in accordance with the applicable provisions of the MARPOL Convention.
- 2 - The installation on board will be monitored before the issuing of the international certificate of prevention of pollution by hydrocarbons and its annexes.

#### **ARTICLE 9-02: Ships with a gross tonnage of less than 400 tons**

- 1 - Vessels of less than 400 tons gross tonnage shall not be subject to the MARPOL Convention.

Measures shall be adopted to minimize risks.

#### **ARTICLE 9-03: Oil record book**

- 1 - Vessels of more than 400 tons gross tonnage must have an oil record book.