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Working Party on Inland Water Transport
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**AMENDMENT OF THE RECOMMENDATIONS ON TECHNICAL REQUIREMENTS
FOR INLAND NAVIGATION VESSELS
(annex to resolution No. 17, revised)**

Addendum 1

Note by the secretariat

The Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation, at its twenty-first session, considered the draft amended text of chapters 9, 10A, 11 and 12 of the annex, as transmitted to it by the ad hoc group of experts and reflected in TRANS/SC.3/WP.3/AC.2/2000/1 and Adds.1-2 and TRANS/SC.3/WP.3/AC.2/2000/1/Add.1/Corr.1, modified the text as indicated in TRANS/SC.3/WP.3/42, paragraph 9 and requested the secretariat to submit them to the Working Party on Inland Water Transport for consideration and provisional approval (TRANS/SC.3/WP.3/42, para. 9).

The text of chapters 9, 10A, 11 and 12 is reproduced below for consideration by the Working Party on Inland Water Transport.

CHAPTER 9

LIQUIFIED GAS INSTALLATIONS FOR DOMESTIC PURPOSES

9-1 GENERAL

9-1.1 Every gas installation shall consist essentially of one or more gas receptacles, one or more pressure reducers, a distribution system and a number of gas-consuming appliances.

9-1.2 Such installations may be operated only with the gas mixture of which the customary name is propane.*

9-2 INSTALLATION

9-2.1 Gas installations shall, in all their parts, be suitable for the use of propane and shall be built and installed in accordance with the state of the art.

9-2.2 A gas installation may be used only for domestic purposes in spaces that comply with the requirements of the Administration.

9-2.3 There may be several separate gas installations on board. Accommodation areas separated by a cargo hold or a fixed tank shall not be supplied by the same installation.

9-2.4 Installations which are not permanently fixed may be used only if they meet the special requirements laid down by the Administration.

9-3 RECEPTACLES

9-3.1 Only receptacles with a capacity of between 5 and 35 kg shall be allowed. In the case of passenger vessels, the basin Administration may approve the use of receptacles with a larger content.

9-3.2 The receptacles shall satisfy the requirements in force. They shall bear the official stamp certifying that they have passed the statutory tests.

9-4 LOCATION AND ARRANGEMENT OF THE SUPPLY UNIT

9-4.1 The supply unit shall be installed on deck in a special cupboard located outside the accommodation area in such a position that it does not interfere with movement on board. It shall not, however, be installed against the forward or after bulwark plating. The cupboard may be a wall cupboard set into the superstructure provided that it is gastight and can only be opened from outside. It shall be so located that the pipes leading to the gas consumption points are as short as possible.

* Gas mixture defined in ADN, annex A, marginal 6201, 2° F as mixture C.

Each installation may have up to four receptacles in operation simultaneously, with or without the use of an automatic changeover valve. The number of receptacles on board, including spare receptacles, shall not exceed six per installation.

On passenger vessels having galleys or canteens for the passengers, up to six receptacles per installation may be in operation simultaneously, with or without the use of an automatic changeover valve. The number of receptacles on board such vessels, including spare receptacles, shall not exceed nine per installation.

The pressure reducer or, in the case of two-stage reduction, the first pressure reducer shall be fitted to the inside wall of the cupboard for the receptacles.

9-4.2 The supply unit shall be so installed that any leaking gas can escape from the cupboard without any risk that it may penetrate the vessel or come into contact with any possible source of ignition.

9-4.3 The cupboard shall be constructed of fire-resistant materials and shall be adequately ventilated by openings at the top and bottom. The receptacles shall be placed upright in the cupboard in such a way that they cannot overturn.

9-4.4 The cupboard shall be so constructed and situated that the temperature of the receptacles cannot exceed 50 °C.

9-4.5 The words "liquefied gas" and "no smoking" symbol at least 100 mm in diameter shall be affixed to the outer wall of the cupboard.

9-5 SPARE AND EMPTY RECEPTACLES

9-5.1 Spare and empty receptacles which are not stored in the supply unit shall be stored outside the accommodation area and the wheelhouse in a cupboard constructed in accordance with the requirements of section 9-4, paragraphs 9-4.2 to 9-4.5.

9-6 PRESSURE REDUCERS

9-6.1 The gas-consuming appliances may be connected to the receptacles only through a distribution system fitted with one or more pressure reducers to bring the gas pressure down to the working pressure. The pressure may be reduced in one or two stages. All pressure reducers shall be set permanently at a pressure determined in accordance with section 9-7 below.

9-6.2 The final pressure reducer shall be either fitted with or followed by a device to protect the piping automatically against excess pressure in the event of a malfunction of the pressure reducer. Any gas which this protection device allows to escape shall be evacuated into the open air without any risk that it may penetrate the vessel or come into contact with any possible source of ignition; if necessary a special vent shall be fitted for this purpose.

9-6.3 The safety devices and the vents shall be protected against ingress of water.

9-7 PRESSURE

9-7.1 The pressure at the outlet of the final pressure reducer shall not be more than 5 kPa above atmospheric pressure, with a tolerance of 10%.

9-7.2 In the case of two-stage reduction, the intermediate pressure shall not be more than 250 kPa above atmospheric pressure.

9-8 PIPING AND FLEXIBLE TUBES

9-8.1 The piping shall consist of fixed steel or copper tubing.

The pipes connected to the receptacles, however, shall consist of high pressure flexible tubing or spiral tubes suitable for the gas used. The gas consuming appliances may, if they are not installed as fixtures, be connected up by means of suitable flexible tubes not more than 1 m long.

9-8.2 The piping shall be able to withstand all influences to which it may be subjected under normal operating conditions on board, in particular corrosion and stresses, and its characteristics and layout shall be such that it ensures a satisfactory flow of gas at the appropriate pressure to the gas consuming appliances.

9-8.3 The piping shall include as few joints as possible. The piping and the joints shall be gastight and shall remain gastight despite any vibration or expansion to which they may be subjected.

9-8.4 The piping shall be readily accessible, properly fixed and protected at every point where it might be subjected to impact or friction, particularly where it passes through metal bulkheads or other metal partitions.

The entire outer surface of steel piping shall be treated against corrosion.

9-8.5 Flexible pipes and their joints shall be able to withstand any stresses which may occur under normal operating conditions on board. They shall be fitted without load and in such a way that they cannot be overheated and can be inspected throughout their length.

9-9 DISTRIBUTION SYSTEM

9-9.1 No part of a gas installation shall be situated in the machinery space.

9-9.2 It shall be possible to shut off the entire distribution system by means of a valve which is readily and quickly accessible.

9-9.3 Each gas-consuming appliance shall be supplied by a separate branch of the distribution system, and each such branch shall be controlled by a separate closing device.

9-9.4 The valves shall so far as possible be protected from the weather and against impact.

9-9.5 The ends of pipes intended for connection to gas-consuming appliances shall be closable by a flange or cap even if they are equipped with a shut-off valve.

9-9.6 An inspection joint shall be fitted after each pressure reducer. It shall be ensured, using a closing device, that in pressure tests the pressure reducer is not exposed to the test pressure.

9-10 GAS-CONSUMING APPLIANCES AND THEIR INSTALLATION

9-10.1 The only consuming appliances that may be installed shall be those which have been approved by the Administration and which are equipped with devices that effectively prevent the escape of gas in case of extinction either of the burner or of the pilot flame.

9-10.2 Each appliance shall be so placed and connected as to avoid any risk that the connecting piping may be accidentally wrenched loose.

9-10.3 The installation of gas-consuming appliances in the wheelhouse shall be permitted only if the wheelhouse is so constructed that no leaking gas can escape into the lower parts of the vessel.

9-10.4 Gas-consuming appliances may be installed in sleeping rooms only if the combustion process does not depend on the ambient air.

9-10.5 Gas-consuming appliances in which the combustion process depends on the ambient air shall be installed only in rooms of sufficient size.

9-11 VENTILATION AND EVACUATION OF THE COMBUSTION GASES

9-11.1 Heating and water-heating appliances and refrigerators shall be connected to a duct for evacuating combustion gases into the open air.

9-11.2 In spaces containing gas-consuming appliances in which the combustion process depends on the ambient air, the supply of fresh air and the evacuation of the combustion gases shall be ensured by means of apertures of adequate dimensions determined according to the capacity of the appliances, with a clear section of at least 150 cm² per aperture.

9-11.3 The ventilation apertures shall not have any closing device and shall not lead into sleeping rooms.

9-11.4 The evacuation devices shall be such as to ensure reliable and effective evacuation of the combustion gases. They shall be fire-resistant and their effectiveness shall not be impaired by the room ventilators.

9-12 INSTRUCTIONS FOR USE AND SAFETY

9-12.1 A notice containing instructions on the use of the installation shall be affixed on board in a suitable place. The notice shall bear, in particular, the following instructions:

"The valves of receptacles which are not connected to the distribution system shall be closed even if the receptacles are presumed to be empty."

"Flexible pipes shall be renewed as soon as their condition so requires."

"All receptacles shall be kept connected up unless the corresponding connecting pipes are closed by valves or sealed."

9-13 INSPECTION

9-13.1 Before a gas installation is put into service, after any modification or repair and at each renewal of the entry referred to in section 9-15 below, the whole of the installation shall be submitted to an expert recognized by the Administration for inspection. At the time of the inspection, the expert shall check whether the installation complies with the requirements of this chapter.

The expert shall submit a report to the competent authority of the Administration.

9-14 TESTS AND TRIALS

The completed installation shall be subjected to the following tests and trials:

9-14.1 Medium-pressure piping between the first pressure reducer and the valves upstream of the final pressure reducer:

- (i) Strength test, carried out with air, an inert gas or a liquid at a pressure prescribed by the Administration. This pressure shall not be less than 2 MPa above atmospheric pressure;
- (ii) Gastightness test, carried out with air or an inert gas at a pressure of 350 kPa above atmospheric pressure.

9-14.2 Piping at the working pressure between the single or final pressure reducer and the valves upstream of the gas-consuming appliances:

Gastightness test, carried out with air or an inert gas at a pressure of 100 kPa above atmospheric pressure.

9-14.3 Piping situated between the single or final pressure reducer and the controls of the gas-consuming appliance:

Gastightness test at a pressure of 20 kPa above atmospheric pressure.

9-14.4 In the tests referred to in paragraph 9-14.1 (ii), 9-14.2 and 9-14.3, the piping shall be considered gastight if, after sufficient time has elapsed for thermal balancing, no drop in the test pressure is noted during the following 10 minutes.

9-14.5 Receptacle connectors, piping and other fittings subjected to the pressure in the receptacles, and joint between the pressure reducer and the piping:

- (i) Strength test, carried out with air, an inert gas or liquid at the pressure prescribed by the Administration but in any case not less than 2.5 MPa above atmospheric pressure;
- (ii) Gastightness test, carried out with a foam-producing product at the working pressure.

9-14.6 All gas-consuming appliances shall, on being put into service, be tested at the working pressure to ensure that combustion is satisfactory with the controls in the different positions.

The safety devices shall be checked to ensure that they work properly.

9-14.7 After the test referred to in paragraph 9-14.6 above, trials shall be carried out with every gas-consuming appliance connected to a flue to check whether, after five minutes' operation at full capacity, with windows and doors closed and the ventilation devices in operation, any combustion gases are escaping through the damper.

If combustion gases are escaping otherwise than sporadically, the cause shall immediately be sought and eliminated. The appliance shall not be approved until all defects have been corrected.

9-15 ENTRY IN THE APPROPRIATE VESSEL'S PAPER

9-15.1 For every gas installation, the appropriate vessel's paper shall contain an entry stating that the installation complies with the requirements of this chapter.

9-15.2 This entry shall be made by the competent authority of the Administration following the inspection referred to in section 9-13 above.

9-15.3 The entry shall be valid for a period not exceeding three years and may be renewed only after another inspection has been carried out in accordance with section 9-13.

At the request of the owner of the vessel, accompanied by a statement of his reasons for making the request, the Administration may extend the validity of the entry by not more than three months without carrying out the inspection referred to in section 9-13 above. Such extension shall be granted in a written document which shall be kept on board the vessel. Such extension shall not affect the date of the next scheduled inspection.

CHAPTER 10 A

STEERING GEAR

10A-0 DEFINITIONS

- 10A-0.1 Steering gear: all the equipment necessary for steering the vessel, such as to ensure the manoeuvrability laid down in chapter X.
- 10A-0.2 Rudder: the rudder or rudders, with shaft, including the rudder quadrant and the components connecting with the steering apparatus.
- 10A-0.3 Steering apparatus: the part of the steering gear which produces the movement of the rudder.
- 10A-0.4 Drive unit: the steering-apparatus control, between the power source and the steering apparatus.
- 10A-0.5 Power source: the power supply to the steering control and the steering apparatus produced by an on-board network, batteries or an internal combustion engine.
- 10A-0.6 Steering control: the component parts of and circuitry for the operation of a power-drive unit;
- 10A-0.7 Steering apparatus control unit: the control for the steering apparatus, its drive unit and its power source.
- 10A-0.8 Manual drive: a system whereby manual operation of the hand wheel, moves the rudder by means of a mechanical or hydraulic transmission, without any additional power source.
- 10A-0.9 Manually-operated hydraulic drive: a manual control actuating a hydraulic transmission.
- 10A-0.10 Rate-of-turn regulator: equipment which automatically produces and maintains a given rate of turn of the vessel in accordance with preselected values.

10A-1 GENERAL REQUIREMENTS

- 10A-1.1 Vessels shall be equipped with steering gear which ensures at least the manoeuvrability prescribed in chapter X.
- 10A-1.2 The steering gear shall be so constituted that the rudder position cannot change unexpectedly.
- 10A-1.3 The entire steering gear shall be designed for a permanent list up to 15°, an angle of trim up to 5° and ambient temperatures from - 20° C to + 40° C.

10A-1.4 The component parts of the steering gear shall be rugged enough always to be able to withstand the stresses to which they may be subjected during normal operation. No external forces applied to the rudder shall impair the operating capacity of the steering equipment and its controls.

10A-1.5 The steering gear shall comprise a power-driven unit if the forces required to activate the rudder require so.

10A-1.6 The power-driven unit of the steering gear shall be protected against overload.

10A-1.7 Shaft bushings shall be so designed as to prevent any leakage of water-polluting lubricants.

10A-2 STEERING APPARATUS CONTROL UNIT

10A-2.1 If the steering gear has a power-driven unit, in case of the failure or breakdown of the steering apparatus control unit, it shall be possible to bring a second unit or a manual drive into service within five seconds.

10A-2.2 If the second steering apparatus control unit or manual drive is not automatically brought into service, it shall be possible for the helmsman to bring it into service simply and rapidly by means of a single manipulation.

10A-2.3 The second drive unit or manual drive shall ensure the manoeuvrability prescribed in Chapter X.

10A-3 HYDRAULIC DRIVE UNIT

10A-3.1 No consumer appliance may be connected to the hydraulic drive unit of the steering gear.

10A-3.2 If there are two hydraulic drive units a hydraulic tank is required for each of them; double tanks, however, are permitted. The hydraulic tanks shall be equipped with an oil low level indicator with alarm.

10A-3.3 The dimensions, construction and arrangement of the piping shall ensure as far as possible that they will not be damaged by mechanical effects or fire.

10A-3.4 Hoses are only permitted when their use is indispensable to absorb vibrations and permit the freedom of movement of the constituent parts. They shall be rated according to the maximum working pressure.

10A-4 POWER SOURCE

10A-4.1 If the steering gear is equipped with two power-driven units it shall have two power sources.

10A-4.2 If the second power source for the power-driven unit is not permanently available while the vessel is under way, a buffer device is required. Its capacity shall be sufficient to provide power during the period needed for bringing the second power source into operation.

10A-4.3 In the case of electrical power sources no other consumers may be powered by the network supplying the steering gear.

10A-5 MANUAL DRIVE

10A-5.1 The hand wheel shall not be actuated by the power-driven unit.

10A-5.2 Regardless of rudder position hand wheel kickback must be prevented when the manually-operated wheel is engaged automatically.

10A-6 RUDDER-PROPELLER, WATER-JET, CYCLOIDAL-PROPELLER, AND ACTIVE BOW-RUDDER SYSTEMS

10A-6.1. In the case of rudder-propeller, water-jet, cycloidal-propeller or active bow-rudder installations where the remote control of the modification of the direction of the drive is electric, hydraulic or pneumatic, there shall be two steering apparatus control units independent of each other, between the wheelhouse and the installation, and on analogy, meet the requirements of paragraphs 10A-1 to 10A-5.

Such systems are not subject to this section if they are not necessary in order to achieve the manoeuvrability required by chapter X or if they are only needed for the stopping test.

10A-6.2 Where there are several rudder-propeller, water-jet, cycloidal-propeller or bow-rudder systems that are independent of each other the second steering apparatus control unit is not necessary if the vessel retains the manoeuvrability required by chapter X if one of the units fails.

10A-7 INDICATORS AND MONITORING DEVICES

10A-7.1 The rudder position shall be clearly displayed at the steering position. If the rudder-position indicator is electrical it shall have its own power supply.

10A-7.2 There shall be at least the following indicators and monitoring devices at the steering position:

- (a) oil level in the hydraulic tanks in accordance with paragraph 10A-3.2, and working pressure of the hydraulic system;
- (b) failure of the electrical supply for the steering control;
- (c) failure of the electrical supply for the drive unit;
- (d) failure of the rate-of-turn regulator;

- (e) failure of the required buffer devices.

10A-8 RATE-OF-TURN REGULATORS

10A-8.1 The rate-of-turn regulators and their components shall meet the requirements laid down in paragraph 6 – 2.18.

10A-8.2 The proper functioning of the rate-of-turn regulator shall be displayed at the steering position by means of a green warning light.

Any lack of or unacceptable variations in the supply voltage and an unacceptable fall in the speed of rotation of the gyroscope shall be monitored.

10A-8.3 Where, in addition to the rate-of-turn regulator, there are other steering control systems, it shall be possible to distinguish clearly at the steering position which of these systems has been activated. It shall be possible to shift from one system to another immediately. The rate-of-turn regulator shall not cause any kickback in the steering systems.

10A-8.4 The electrical supply to the rate-of-turn regulator shall be independent of that for the other power consumers.

10A-8.5 The gyroscopes, detectors and rate-of-turn indicators used in the rate-of-turn regulators shall meet the minimum requirements and test conditions concerning rate-of-turn indicators for inland waterways as set by the competent authority.

10A-9 APPROVAL

10A-9.1 The compliance of the installed steering system shall be checked by a competent authority on the inspection of vessels. It may, for this purpose, request the following documents:

- (a) description of the steering gear;
- (b) drawings and information on the steering apparatus control units;
- (c) information concerning the steering apparatus;
- (d) electrical wiring diagram;
- (e) description of the rate-of-turn regulator;
- (f) system-use instructions.

10A-9.2 Operation of the entire steering gear shall be checked by means of a navigation test. It shall be checked that a predetermined course can be reliably maintained by the rate-of-turn regulators and that bends can be negotiated safely.

CHAPTER 11

SPECIAL WHEELHOUSE ARRANGEMENTS FOR RADAR STEERING BY ONE PERSON

11-1 GENERAL PROVISION

A wheelhouse shall be deemed to be specially arranged for radar steering by one person if it meets the requirements of this chapter.

11-2 GENERAL REQUIREMENTS RELATING TO DESIGN

11-2.1 The wheelhouse shall be designed in such a way that the helmsman¹ shall be able to accomplish his task while seated.

11-2.2 All appliances, instruments and controls shall be so arranged that the helmsman can use them conveniently during the voyage without leaving his seat and without losing sight of the radar screen.

11-2.3 The radar display shall be placed in the wheelhouse forward of the helmsman's position in such a way that the helmsman can observe the image on the screen with no significant change in his line of vision. The radar image shall continue to be perfectly visible, without a mask or screen, whatever the lighting conditions applying outside the wheelhouse. The rate-of-turn indicator shall be installed directly above or below the radar screen or be incorporated into this.

11-3 SIGNALLING EQUIPMENT

11-3.1 Signal lights shall be controlled from a light-control switchboard on which the tell-tale lamps shall be arranged in position corresponding to the actual positions of the signal lights. Failure of a signal light shall cause the corresponding tell-tale lamp to go out or to be signalled in another manner by the corresponding warning light.

11-3.2 It shall be easy to operate the acoustic warning signals while performing steering operations.

11-4 INSTALLATIONS FOR MANOEUVRING THE VESSEL AND CONTROLLING THE PROPELLING MACHINERY

11-4.1 The vessel's steering gear shall be controlled by one lever, which can be easily manipulated manually. Every movement of the steering device shall be accompanied by an exact indication of the position of the rudders. The neutral position shall be perceptibly indicated. The rudders shall remain in position in the absence of further actuations of the steering device.

¹ The Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation is considering if the term "helmsman" ("homme de barre" in French and "rulevoy" in Russian) should not be replaced by "boatmaster" ("conducteur" in French and "sudovoditel" in Russian).

11-4.2 If the vessel is also fitted with reversing rudders or bow rudders, they shall be controlled by separate devices meeting the above requirements. This requirement shall also apply to convoys where the steering gear of vessels other than the vessels propelling the convoy is used.

11-4.3 The number of revolutions of the main engine or the propellers and the direction of rotation of the propellers shall be indicated.

11-4.4 A device for emergency stopping of the main machinery shall be provided and shall function independently of the remote control system.

11-5 INSTALLATIONS FOR ANCHOR MANOEUVRES

11-5.1 The helmsman shall be able, without leaving his seat, to drop anchors which are necessary for an emergency stop of his vessel.

11-6 COMMUNICATION EQUIPMENT

11-6.1 Vessels shall be fitted with a radiotelephone installation for ship-to-ship and ship-to-shore communication. Reception shall be by loudspeaker and transmission by fixed microphone. Reception/transmission shall be selected by a push-button.

11-6.2 The connection to the public communication system if available shall be independent of the installation referred to in paragraph 11-6.1.

11-6.3 There shall be a voice intercommunication network on board. It shall enable the helmsman to communicate at least with the bow of the vessel or the head of the convoy, the skipper's cabin, the crew accommodation and the stern of the craft or convoy if no other means of direct communication from the wheelhouse is possible. The voice intercommunication network shall be so installed that the helmsman can easily use it while carrying out the steering operations. At all sound-link locations, reception shall be by loudspeaker and transmission by fixed microphone. The link with the bow and stern of the craft or head and stern of the convoy may be by radio-telephone.

11-7 CERTIFICATES

11-7.1 Where a vessel complies with the requirements of this chapter in respect of wheelhouses that have been designed for radar navigation by one person, the following statement shall be entered in the certificate:

“The vessel has special wheelhouse arrangements for steering on radar by one person”.

CHAPTER 12

FIRE PROTECTION

12-1 STRUCTURAL REQUIREMENTS

12-1.1. The hull, superstructures, structural bulkheads, decks and deckhouses shall be made of steel. The Administration or a recognized Classification Society may allow the use of other materials with due regard to the risk of fire.

In addition to the requirement set out in the first sentence of 12-1.1 above on vessels with a length of 85 m or more and intended for navigation in zone 1, in accommodation spaces, the corridor bulkheads shall be made of steel or other materials approved by the Administration or recognized Classification Society with due regard to the risk of fire.

12-1.2 Crew elevator trunks within accommodation and interior stairways below the open deck shall be made of steel or equivalent material.

12-1.3 The bulkheads of galleys, paint stores, lamprooms, boatswain's stores (when adjacent to accommodation spaces) and emergency generator rooms, if any, shall be made of steel or equivalent material.

12-1.4. Deck, bulkheads and ceiling coverings within accommodation spaces, especially on decks forming the upper part of machinery space and store rooms and escape routes shall be made of fire-resistant materials. The furniture in the above-mentioned accommodation spaces shall be made of a material which will not easily catch fire. In the case of fire or heating the materials shall not release toxic or explosive gases in dangerous concentrations.

12-1.5. Bulkheads, ceilings and doors of machinery spaces, boiler rooms and bunkers shall be made of steel or equally fire-resistant material.

Stairways and ladders leading to machinery spaces, boiler rooms and bunkers shall be fixed permanently and made of steel or equivalent material.

12-1.6. Paints, varnishes and similar products having a nitro-cellulose or other highly inflammable base shall not be used in machinery spaces.

12-1.7. Tanks and their pipelines as well as other accessories shall be laid out and arranged with due regard to the risk of fire and in such a way that no fuel or gas can escape accidentally into the vessel. Tank valves intended for fuel sampling or water drainage shall close automatically. Materials with a low resistance to heat shall not be used for overboard scuppers, sanitary discharges or other outlets which are close to the water line, or in places where failure of the material in the event of fire might cause flooding.

12-1.8. At tank outlets the pipelines for the distribution of liquid fuels shall be fitted with a shutoff device that can be operated from the deck.

12-1.9. Electric radiators shall be so designed and fixed in position as to reduce fire risks to a minimum.

12-1.10. Forced ventilation of machinery spaces shall be capable of being stopped from an easily accessible position outside the machinery spaces.

12-1.11. Automatic devices for detecting and signalling about smoke or heat, which indicate fire on board, shall satisfy the requirements of the Administration or recognized Classification Society.

12-2 MEANS OF ESCAPE

12-2.1. In all crew spaces and spaces in which crew members are normally employed, stairways and ladders shall be so installed as to provide a ready means of escape to an open deck.

12-2.2. Living and sleeping quarters shall have at least two exits as far apart from each other as possible which serve as escape routes. One of them may be designed as an emergency exit. This does not apply to areas with an exit giving directly onto the deck or into a corridor which serves as an escape route, provided the corridor has two exits at a distance from each other and giving onto port and starboard. Emergency exits, which may include skylights and windows, shall have a clear opening of at least 0.36 m² with a smallest side of at least 0.50 m and permit rapid evacuation in an emergency.

12-2.3. Engine and boiler rooms shall have two exits of which one may be an emergency exit.

The second exit may be dispensed with if:

- (a) the total floor area (average length x average width) of the engine or boiler room does not exceed 35 m² and
- (b) the distance between each point where service or maintenance operations are to be carried out and the exit, or foot of the stairway near the exit providing access to the outside, is not longer than 5 m and
- (c) a fire extinguisher is placed at the maintenance station that is furthest removed from the exit door and also, by way of a derogation from Article 12-3.1 (e) below, where the installed power of the engines does not exceed 100 kW.

12-3 FIRE-FIGHTING APPLIANCES

12-3.1. There shall be at least:

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|-----|---|-------------------------------|
| (a) | in the wheelhouse: | 1 portable fire extinguisher; |
| (b) | close to each means of access from the deck to the accommodation: | 1 portable fire extinguisher; |
| (c) | close to each means of access to service premises that are not accessible from the accommodation, and which contain heating, cooking or refrigerating equipment using solid or liquid fuels | 1 portable fire extinguisher; |
| (d) | at each entrance to the engine room and boiler rooms: | 1 portable fire extinguisher; |
| (e) | at an appropriate point in the engine rooms that is beneath the deck, where the total power output is more than 100 kW: | 1 portable fire extinguisher. |

12-3.2. The extinguishers shall be suitable for their purpose and shall meet the requirements of the Administration or recognized Classification Society. They shall be inspected and checked at least once every two years. A certificate to that effect, signed by the firm or person that carried out the inspection, shall be kept on board.

12-3.3. The extinguishing substance may neither be halon nor contain a product which is likely to release toxic gases, such as carbon tetrachloride during use. Portable fire extinguishers using CO₂ may only be used to fight fires at specific locations such as electrical installations, kitchens; the quantity of CO₂ shall not constitute a health hazard.

12-3.4. Extinguishers sensitive to frost or heat shall be installed or protected in such a manner that they are always ready for use.

12-3.5. If the fire-fighting appliances are so installed as to be concealed from view, the plates or doors concealing them shall bear a red symbol not less than 100 mm high.

12-3.6. Fixed fire-extinguishing installations shall meet the requirements of the Administration or of a recognized Classification Society. The use of halon is not authorized. The equipment shall be checked at least every two years by an approved expert. The dated inspection certificates, signed by the inspector involved, shall be kept on board.

12-3.7. In addition to the above provisions of this chapter, all vessels intended for navigation in zone 1 shall be provided with fire pumps, pressure piping for fire-extinguishing water, and fire hydrants and hoses. The equipment shall meet the requirements of the Administration or recognized Classification Society.

12-3.8. In addition to the above provisions of this chapter, vessels with a length of 110 m or more and intended for navigating in zone 1 shall have a fixed fire-extinguishing installation installed in:

- (a) rooms in which main or auxiliary oil-fired boilers are installed and rooms containing fuel pumps or settling tanks;
 - (b) rooms containing internal combustion engines constituting the main means of propulsion or used as auxiliary engines with the installed total capacity of not less than 750 kW.
-