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### Inland Transport Committee

#### Working Party on Inland Water Transport

##### Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation

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Item 3 (c) of the provisional agenda

##### **Standardization of technical and safety requirements in inland navigation: Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels (Resolution No. 61, revised)**

### **Aligning of Chapters 7, 10, 12 and 13 of the Annex to Resolution No. 61, revised, with the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)**

#### Note by the secretariat

#### Mandate

1. This document is submitted in line with Cluster 5: Inland Waterway Transport, para. 5.1 of the programme of work 2016-2017 (ECE/TRANS/2016/28/Add.1) adopted by the Inland Transport Committee at its seventy-eighth session on 26 February 2016.
2. Following the decision of the Working Party on Inland Water Transport (SC.3) at its sixtieth session to align the Annex to Resolution No. 61 with the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)<sup>1</sup> (ECE/TRANS/SC.3/203, para. 67) adopted by the European committee for drawing up common standards in the field of inland navigation (CESNI). SC.3/WP.3 asked the secretariat to continue revising the Annex to Resolution No. 61 on the basis of the analysis set out in ECE/TRANS/SC3/WP3/2017/7 (ECE/TRANS/SC.3/WP.3/100, para. 42).

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<sup>1</sup> [www.cesni.eu/documents/es-trin/](http://www.cesni.eu/documents/es-trin/)

3. SC.3/WP.3 may wish to use the text of the ES-TRIN provisions reproduced in the Annex to this document as the basis for updating Chapters 7, 10 and 12 of the Annex to Resolution No. 61 and elaborating a new Chapter 13.

## Annex

### Proposal for updating Chapters 7, 10, 12 and elaborating a new Chapter 13 of the Annex to Resolution No. 61, revised

#### I. Proposal for updating Chapter 7, Wheelhouse

The present Section reproduces the text of Articles 7.02, 19.01.5 and 19.01.6 of ES-TRIN.

##### “Article 7.02 Unobstructed view

1. There shall be an adequately unobstructed view in all directions from the steering position.

2. The area of obstructed vision for the helmsman ahead of the vessel in an unladen state with half of its supplies but without ballast shall not exceed 250 m.

To further reduce any area of obstructed vision, only appropriate auxiliary means shall be used.

Auxiliary means for reducing the area of obstructed vision may not be taken into account during the inspection.

3. The helmsman's field of unobstructed vision at his normal position shall be at least 240° of the horizon and at least 140° within the forward semicircle.

No window frame, post or superstructure shall lie within the helmsman's usual axis of vision.

Even in the case where a field of unobstructed vision of at least 240° of the horizon is provided, the inspection body may require other measures and in particular the installation of appropriate auxiliary means if no sufficiently unobstructed view is provided towards the rear. The lower edge of the side windows must be located as low as possible and the upper edge of the side and rear windows must be located as high as possible.

In determining whether the requirements in this Article for visibility from the wheelhouse are met, the helmsman shall be assumed to have a height of eye of 1.65 m above the wheelhouse floor at the steering position.

4. The upper edge of the forward facing windows of the wheelhouse shall be high enough to allow a person at the steering position a clear forward view.

This requirement shall have been fulfilled when a person at the steering position with height of eye of 1.80 m have a clear forward view to at least 10° above the horizontal at eye-level height.

5. There shall in all weathers be appropriate means of providing a clear view through the front windows.

6. The glazing used in wheelhouses shall be made of safety glass and have a light transmission of at least 75%.

To avoid reflections, the wheelhouse front windows must be glare-free or fitted so as to exclude reflections effectively.

The requirement of the second sentence shall have been fulfilled when the windows are inclined from the vertical plane at an angle of not less than 10° and not more than 25°.

...

**Article 19.01**  
**General provisions**

...

5. By way of derogation from Article 7.02(2) first sentence, the area of obstructed vision for the helmsman ahead of the vessel in an unladen state with half of its supplies but without ballast shall not exceed two vessel lengths or 250 m, whichever is less.

6. By way of derogation from article 7.02(3) third subparagraph, a passenger vessel shall be equipped with appropriate auxiliary means when no sufficiently unobstructed view is provided towards the rear. If these auxiliary means do not allow unobstructed view at night, a corresponding restriction shall be entered in item 52 of the inland navigation vessel certificate.”

## II. Proposal for updating Chapter 10, Equipment

The present Section reproduces the text of Articles 13.01.11 to 13.01.14, 13.02.3(b), 13.04, 13.05 and 13.06 of ES-TRIN.

**“Article 13.01**  
**Anchor equipment**

...

11. The minimum breaking load  $R$  of the anchor chains shall be calculated using the following formulae:

- (a) anchors having a mass up to 500 kg:

$$R = 0.35 \cdot P' [kN]$$

- (b) anchors having a mass of more than 500 kg and not exceeding 2000 kg:

$$R = \left( 0.35 - \frac{P' - 500}{15000} \right) P' [kN]$$

- (c) anchors having a mass of more than 2000 kg:

$$R = 0.25 \cdot P' [kN]$$

where

$P'$  is the theoretical mass of each anchor determined in accordance with (1) to (4) and (6).

The breaking load of anchor chains shall be stated according to a standard in force in one of the Member States.

12. Where the anchors have a mass greater than that required by (1) to (6), the breaking load of the anchor chain shall be determined as a function of the actual anchor mass.

In cases where heavier anchors with correspondingly stronger anchor chains are aboard, only the minimum masses and minimum breaking loads required according to (1) to (6) and (11) shall be entered in the inland navigation vessel certificate.

13. Connecting pieces (swivels) between anchor and chain shall withstand a tensile load 20% higher than the breaking load of the corresponding chain.

14. The use of cables instead of anchor chains is permitted. The cables shall have the same breaking load as that required for chains, but shall be 20% longer.

**Article 13.02**  
**Other equipment**

...

3. In addition, the equipment shall include at least:

...

- (b) towing cables;

Tugs shall be equipped with a number of cables that are suitable for their operation.

However, the main cable shall be at least 100 m long and have a breaking load, in kN, not less than one third of the total power, in kW, of the main engine(s).

Motor vessels and pushers that are also able to tow shall be equipped with a towing cable that is at least 100 m long and whose breaking load, in kN, is not less than one quarter of the total power, in kW, of the main engine(s).

...

**Article 13.04**  
**Permanently installed firefighting systems for protecting accommodation spaces,  
wheelhouses and passenger rooms**

1. For protecting accommodation spaces, wheelhouses and passenger rooms, only suitable automatic pressurised water sprinklers are admitted as permanently installed fire-fighting systems.
2. Installation or conversion of the systems shall be carried out only by specialised firms.
3. The systems shall be made of steel or equivalent non-combustible materials.
4. The systems shall be able to spray water at a rate of at least 5 l/m<sup>2</sup> per minute over the area of the largest room to be protected.
5. Systems spraying smaller quantities of water shall have a type-approval pursuant to IMO Resolution A.800 (19)<sup>2</sup> or another Standard recognised by one of the Member States. Type-approval shall be carried out by a recognised classification society or an accredited testing institution. The accredited testing institution shall comply with the European Standard for general requirements for the competence of testing and calibrating laboratories (EN ISO/IEC 17025 : 2005).
6. The systems shall be checked by an expert:
  - (a) before being put into service for the first time;
  - (b) before being put back into service after they have been triggered;
  - (c) before being put back into service after any major modification or repair; and
  - (d) regularly, at least every two years.

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<sup>2</sup> IMO Resolution A.800 (19) adopted on 23 November 1995 — Revised Guidelines for Approval of Sprinkler Systems Equivalent to that referred to in SOLAS Regulation II-2/12.

Inspections as referred to in (d) may also be carried out by a competent person from a competent firm specialising in fire extinguishing systems.

7. When carrying out the check in accordance with (6), the expert or competent person shall verify whether the systems meet the requirements of this Article.

The check shall at least include:

- (a) external inspection of the entire system;
- (b) functional testing of the safety systems and nozzles;
- (c) functional testing of the pressure tanks and pumping system.

8. An inspection attestation, signed by the expert or competent person, shall be issued, showing the date of inspection.

9. The number of installed systems shall be entered in the inland navigation vessel certificate.

#### **Article 13.05**

#### **Permanently installed firefighting systems for protecting engine rooms, boiler rooms and pump rooms**

1. Extinguishing agents

For protecting engine rooms, boiler rooms and pump rooms, the following extinguishing agents may be used in permanently installed fire-fighting systems:

- (a) CO<sub>2</sub> (carbon dioxide);
- (b) HFC 227 ea (heptafluoropropane);
- (c) IG-541 (52% nitrogen, 40% argon, 8% carbon dioxide);
- (d) FK-5-1-12 (Dodecafluoro-2-methylpentane-3-on).

2. Ventilation, air intake

(a) Combustion air for the propulsion engines shall not be extracted from rooms that are to be protected by permanently installed fire-fighting systems. This shall not apply where there are two mutually independent and hermetically separated main engine rooms or if next to the main engine room there is a separate engine room with a bow thruster, ensuring that the vessel is able to make way under its own power in the event of fire in the main engine room.

(b) Any forced ventilation present in the room to be protected shall switch off automatically if the fire-fighting system is triggered.

(c) There shall be devices available with which all apertures which can allow air to enter or gas to escape from the room to be protected can be quickly closed. It shall be clearly recognisable whether they are open or closed.

(d) The air escaping from pressure relief valves in the compressed-air tanks installed in engine rooms shall be conveyed to the open air.

(e) Over- or under-pressure resulting from the inflow of extinguishing agent shall not destroy the components of the surrounding partitions of the room to be protected. It shall be possible for the pressure to equalise without danger.

(f) Protected rooms shall have a facility for extracting the extinguishing agent and the combustion gases. Such facilities shall be capable of being operated from positions outside the protected rooms and which must not be made inaccessible by a fire within such spaces. If there are permanently installed extractors, it shall not be possible for these to be switched on while the fire is being extinguished.

### 3. Fire alarm system

The room to be protected shall be monitored by means of an appropriate fire alarm system. The alarm shall be noticeable in the wheelhouse, the accommodation spaces and the room to be protected.

### 4. Piping system

(a) The extinguishing agent shall be conveyed to the room to be protected and distributed there by means of a fixed piping system. Inside the room to be protected the piping and associated fittings shall be made of steel. Tank connecting pipes and expansion joints shall be exempt from this provided the materials used have equivalent properties in case of fire. Pipes shall be both internally and externally protected against corrosion.

(b) Outlet nozzles shall be dimensioned and fitted such that the extinguishing agent is evenly distributed. In particular the extinguishing agent shall also be effective beneath the floor plates.

### 5. Triggering device

(a) Fire-fighting systems with automatic triggering shall not be permissible.

(b) It shall be possible to trigger the fire-fighting system from a suitable place outside the room to be protected.

(c) Triggering devices shall be installed in such a way that they can be operated even in case of a fire and in the event of damage by fire or explosion in the room to be protected the necessary quantity of extinguishing agent can still be conveyed.

Non-mechanical triggering devices shall be powered from two different mutually independent energy sources. These energy sources shall be located outside the room to be protected. Control lines in the room to be protected shall be designed so as to remain functional for at least 30 minutes in the event of fire. This requirement shall be fulfilled in the case of electric wiring if it complies with the International Standard IEC 60331-21 : 1999.

If triggering devices are installed in such a way that they are out of sight the panel covering them shall be identified by the 'fire-fighting installation' symbol as shown in Figure 6 of Annex 4, having a side length of at least 10 cm, and the following text in red lettering on a white background:

'Feuerlöscheinrichtung

Installation d'extinction

Brandblusinstallatie

Fire-fighting installation'.

(d) If the fire-fighting system is intended for the protection of several rooms, the triggering devices for each room have to be separate and clearly identified.

(e) Next to each triggering device operating instructions in one of the languages of the Member States shall be posted up visibly and indelibly. They shall contain, in particular, instructions regarding:

- (aa) triggering of the fire-fighting system;
- (bb) the need for checking to ensure that all persons have left the room to be protected;
- (cc) action to be taken by the crew when the firefighting system is triggered and when accessing the protected room after triggering or flooding, in particular with regard to the possible presence of dangerous substances;
- (dd) action to be taken by the crew in the case of failure of the fire-fighting system.

(f) The operating instructions shall point out that before the fire-fighting system is triggered combustion engines drawing air from the room to be protected are to be shut down.

#### 6. Warning system

(a) Permanently installed fire-fighting systems shall be provided with acoustic and optical warning systems.

(b) The warning system shall be set off automatically as soon as the fire-fighting system is first triggered. The warning signal shall sound for an appropriate time before the extinguishing agent is released and it shall not be possible to switch it off.

(c) Warning signals shall be clearly visible in the rooms to be protected and outside the accesses to them and clearly audible even under operating conditions producing the loudest inherent noise. They shall be clearly distinct from all other acoustic and optical signals in the room to be protected.

(d) The acoustic warning signals shall be clearly audible in the adjacent rooms even when connecting doors are closed and under operating conditions producing the loudest inherent noise.

(e) If the warning system is not self-monitoring as regards short-circuits, wire breaks and voltage drops, it shall be possible to check that it is working properly.

(f) At every entrance to a room that can be supplied with extinguishing agent, a clearly visible notice shall be put up bearing the following text in red lettering on a white background:

‘Vorsicht, Feuerlöscheinrichtung!

Bei Ertönen des Warnsignals (Beschreibung des Signals) den Raum sofort verlassen!

Attention, installation d'extinction d'incendie !

Quitter immédiatement ce local au signal (description du signal) !

Let op, brandblusinstallatie!

Bij het in werking treden van het alarmsignaal (omschrijving van het signaal) deze ruimte onmiddellijk verlaten!

Warning, fire-fighting installation!

Leave the room as soon as the warning signal sounds (description of signal)!



7. Pressure tanks, fittings and pressure pipes

(a) Pressure tanks, fittings and pressure pipes shall comply with the provisions in force in one of the Member States.

(b) Pressure tanks shall be installed in accordance with the manufacturer's instructions.

(c) Pressure tanks, fittings and pressure pipes are not to be installed in accommodation spaces.

(d) The temperature in cabinets and installation spaces containing pressure tanks shall not exceed 50 °C.

(e) Cabinets or installation spaces on deck shall be firmly fixed in place and have air vents which are to be arranged in such a way that in the event of a leak in the pressure tank no gas can escape into the interior of the vessel. Direct connections to other rooms are not permitted.

8. Quantity of extinguishing agent

If the quantity of extinguishing agent is intended for protecting more than one room, the total amount of extinguishing agent available does not need to be greater than the quantity necessary for the largest room to be protected.

9. Installation, inspection and documentation

(a) The system shall be installed or converted only by a firm specialising in fire-fighting systems. The requirements specified by the extinguishing agent manufacturer and the system manufacturer (product data sheet, safety data sheet) are to be complied with.

(b) The system shall be checked by an expert:

(aa) before being put into service for the first time;

(bb) before being put back into service after it has been triggered;

(cc) before being put back into service after any major modification or repair; and

(dd) regularly, at least every two years.

Inspections as referred to in (dd) may also be carried out by a competent person from a competent firm specialising in fire extinguishing systems.

(c) In the inspection the expert or competent person shall check whether the system meets the requirements of this Article.

(d) The inspection shall cover at least the following:

(aa) external inspection of the entire installation;

(bb) tightness check on pipes;

(cc) functional checking of control and triggering systems;

(dd) checking of tank pressure and content;

(ee) checking of tightness and facilities for locking the room to be protected;

(ff) checking the fire alarm system;

(gg) checking the warning system.

(e) An inspection attestation shall be issued, signed by the expert and showing the date of the inspection.

(f) The number of permanently installed fire-fighting systems shall be entered in the inland navigation vessel certificate.

#### 10. CO<sub>2</sub> fire-fighting systems

Fire-fighting systems using CO<sub>2</sub> as the extinguishing agent shall comply with the following provisions in addition to the requirements under (1) to (9):

(a) CO<sub>2</sub> containers shall be housed outside the room to be protected in a space or cabinet hermetically separated from other rooms. The doors to these installation spaces and cabinets shall open outwards, be lockable and bear on the outside a symbol for 'General danger warning' in accordance with Figure 4 of Annex 4, at least 5 cm in height, together with the marking 'CO<sub>2</sub>' in the same colour and with the same height.

(b) Installation spaces below decks for CO<sub>2</sub> containers shall be accessible only from the open air. These spaces shall have their own adequate artificial ventilation system with extraction ducts, completely separate from other ventilation systems on board.

(c) The CO<sub>2</sub> containers shall not be filled to more than 0.75 kg/l. The specific volume of unpressurised CO<sub>2</sub> gas is to be taken as 0.56 m<sup>3</sup>/kg.

(d) The volume of CO<sub>2</sub> for the room to be protected shall be at least 40% of its gross volume. It shall be possible to supply this volume within 120 seconds, and to check whether supply has been completed.

(e) Opening the container valves and operating the flood valve shall be by separate control operations.

(f) The appropriate time mentioned under (6)(b) shall be at least 20 seconds. There shall be a reliable device to ensure the delay before delivery of the CO<sub>2</sub> gas.

#### 11. HFC-227ea — fire-fighting systems

Fire-fighting systems using HFC-227ea as the extinguishing agent shall comply with the following provisions in addition to the requirements under (1) to (9):

(a) If there are several rooms to be protected, each with a different gross volume, each room shall be provided with its own fire-fighting system.

(b) Each container of HFC-227ea that is installed in the room to be protected shall be equipped with a pressure relief valve. This shall harmlessly release the contents of the container into the room to be protected if the container is exposed to the effects of fire and the fire-fighting system has not been triggered.

(c) Each container shall be fitted with a device for checking the gas pressure.

(d) The containers shall not be filled to more than 1.15 kg/l. The specific volume of the unpressurised HFC-227ea is to be taken as 0.1374 m<sup>3</sup>/kg.

(e) The volume of HFC-227ea for the room to be protected shall be at least 8% of the room's gross volume. This volume shall be supplied within 10 seconds.

(f) The HFC-227ea containers shall be provided with a pressure monitor which triggers an acoustic and optical alarm signal in the wheelhouse in the event of an unauthorised loss of propellant. If there is no wheelhouse, this alarm signal shall be given outside the room to be protected.

(g) After flooding, the concentration in the room to be protected shall not exceed 10.5%.

(h) The fire-fighting system shall not contain any parts made of aluminium.

12. IG-541 — fire-fighting systems

Fire-fighting systems using IG-541 as the extinguishing agent shall comply with the following provisions in addition to the requirements under (1) to (9):

(a) If there are several rooms to be protected, each with a different gross volume, each room shall be provided with its own fire-fighting system.

(b) Each container of IG-541 that is installed in the room to be protected shall be equipped with a pressure relief valve. This shall harmlessly release the contents of the container into the room to be protected if the container is exposed to the effects of fire and the fire-fighting system has not been triggered.

(c) Each container shall be fitted with a device for checking the contents.

(d) The filling pressure of the container shall not exceed 200 bar at + 15 °C.

(e) The volume of IG-541 for the room to be protected shall be at least 44% and no more than 50% of the room's gross volume. This volume shall be supplied within 120 seconds.

13. FK-5-1-12 — firefighting systems

Firefighting systems using FK-5-1-12 as the extinguishing agent shall comply with the following provisions in addition to the requirements under (1) to (9):

(a) If there are several rooms to be protected, each with a different gross volume, each room shall be provided with its own firefighting system.

(b) Each container of FK-5-1-12 installed in the room to be protected shall be equipped with an overpressure relief valve. The pressure relief valve shall harmlessly release the contents of the container into the room to be protected if the container is exposed to the effects of fire and the fire-fighting system has not been triggered.

(c) Each container shall be fitted with a device for checking the gas pressure.

(d) The containers shall not be filled to more than 1.00 kg/l. The specific volume of the unpressurised FK-5-1-12 is to be taken as 0.0719 m<sup>3</sup>/kg.

(e) The volume of FK-5-1-12 for the room to be protected shall be at least 5.5% of the room's gross volume. This volume shall be supplied within 10 seconds.

(f) The FK-5-1-12 containers shall be provided with a pressure monitor which triggers an acoustic and optical alarm signal in the wheelhouse in the event of an unauthorised loss of propellant. If there is no wheelhouse, this alarm signal shall be given outside the room to be protected.

(g) After flooding, the concentration in the room to be protected shall not exceed 10.0%.

**Article 13.06**

**Permanently installed firefighting systems for protecting objects**

Permanently installed firefighting systems for protecting objects are prohibited.”

### **III. Proposal for updating Chapter 12, Crew accommodation**

The present Section reproduces the text of Article 15.05 of ES-TRIN.

**“Article 15.05  
Potable water installations**

1. Vessels with accommodation shall have a potable water installation. Potable water tank filling apertures and potable water hoses shall be marked as being intended exclusively for potable water. Potable water filler necks shall be installed above the deck.
2. Potable water installations shall:
  - (a) on their inner surfaces be made of a material which resists corrosion and poses no physiological danger;
  - (b) be free of pipe sections where a regular flow of water is not guaranteed;
  - (c) be protected against excessive heating.
3. In addition to (2), potable water tanks shall:
  - (a) have a capacity of at least 150 litres per person normally living on board, and at least per crew member;
  - (b) have a suitable, lockable opening to enable the inside to be cleaned;
  - (c) have a water level indicator;
  - (d) have ventilation pipes which lead to the open air or are fitted with appropriate filters.
4. Potable water tanks shall not share walls with other tanks. Potable water pipes shall not pass through tanks containing other liquids. Connections are not permitted between the potable water supply system and other pipes. Pipes carrying gas or liquids other than potable water shall not pass through potable water tanks.
5. Potable water pressure vessels shall operate only on uncontaminated compressed air. Where it is produced by means of compressors, appropriate air filters and oil separators shall be installed directly in front of the pressure vessel unless the water and the air are separated by a diaphragm.”

### **IV. Proposal for a new Chapter 13, Fuel-fired heating, cooking and refrigerating equipment**

The present Section reproduces the text of Chapter 16 of ES-TRIN.

**“CHAPTER 16  
FUEL-FIRED HEATING, COOKING AND REFRIGERATING EQUIPMENT**

**Article 16.01  
General**

1. Heating, cooking and refrigeration equipment running on liquefied gas shall meet the requirements of Chapter 17.
2. Heating, cooking and refrigeration equipment, together with its accessories, shall be so designed and installed that it is not dangerous even in the event of overheating. It shall be so installed that it cannot overturn or be moved accidentally.

3. The equipment referred to in (2) shall not be installed in areas in which substances with a flash point below 55 °C are used or stored. No flues from these installations may pass through such areas.
4. The supply of air necessary for combustion shall be ensured.
5. Heating appliances shall be securely connected to flues, which shall be fitted with suitable cowls or devices affording protection against the wind. They shall be arranged in such a manner as to permit cleaning.

#### **Article 16.02**

##### **Use of liquid fuels, oil-fired equipment**

1. Heating, cooking and refrigeration equipment which uses liquid fuel may be operated only with fuels whose flash point is above 55 °C.
2. By way of derogation from (1), cooking appliances and heating and refrigeration appliances fitted with burners with wicks and running on commercial paraffin oil may be permitted in the accommodation and wheelhouse provided the capacity of the fuel tank does not exceed 12 litres.
3. Appliances fitted with burners with wicks shall be:
  - (a) fitted with a metal fuel tank whose filling aperture may be locked and which has no soft-solder joints below the maximum filling level, and shall be designed and installed in such a way that the fuel tank cannot be opened or emptied accidentally;
  - (b) capable of being lit without the aid of another liquid fuel;
  - (c) so installed as to ensure the safe evacuation of combustion gases.

#### **Article 16.03**

##### **Vaporising oil burner stoves and atomising oil burner heating appliances**

1. Vaporising oil burner stoves and atomising oil burner heating appliances shall be built in accordance with best practice.
2. Where a vaporising oil burner stove or an atomising oil burner heating appliance is installed in an engine room, the air supply to the heating appliance and the engines shall be so designed that the heating appliance and the engines can operate properly and safely independently of one another. Where necessary, there shall be a separate air supply. The equipment shall be installed in such a way that no flame from the burner can reach other parts of the engine room installations.

#### **Article 16.04**

##### **Vaporising oil burner stoves**

1. It shall be possible to light vaporising oil burner stoves without the aid of another combustible liquid. They shall be fixed above a metal drip pan which encompasses all the fuel-carrying parts, whose sides are at least 20 mm high and which has a capacity of at least 2 litres.
2. For vaporising oil burner stoves installed in an engine room, the sides of the metal drip pan prescribed in (1) shall be at least 200 mm high. The lower edge of the vaporising burner shall be located above the edge of the drip pan. In addition, the upper edge of the drip pan shall extend at least 100 mm above the floor.
3. Vaporising oil burner stoves shall be fitted with a suitable regulator which, at all settings, ensures a virtually constant flow of fuel to the burner and which prevents any fuel leak should the flame go out. Regulators shall be considered suitable which function

properly even when exposed to vibration and inclined up to 12° and which, in addition to a level-regulating float, have

(a) a second float which closes off the fuel supply safely and reliably when the permitted level is exceeded, or

(b) an overflow pipe, but only if the drip pan has sufficient capacity to accommodate at least the contents of the fuel tank.

4. Where the fuel tank of a vaporising oil burner stove is installed separately:

(a) the drop between the tank and the burner feed may not exceed that laid down in the manufacturer's operating instructions;

(b) it shall be so installed as to be protected from unacceptable heating;

(c) it shall be possible to interrupt the fuel supply from the deck.

5. The flues of vaporising oil burner stoves shall be fitted with a device to prevent draught inversion.

#### **Article 16.05**

##### **Atomising oil burner heating appliances**

Atomizing oil burner heating appliances shall in particular meet the following requirements:

(a) adequate ventilation of the burner shall be ensured before the fuel is supplied;

(b) the fuel supply shall be regulated by a thermostat;

(c) the fuel shall be ignited by an electric device or by a pilot flame;

(d) a flame monitoring device shall cut off the fuel supply when the flame goes out;

(e) the main switch shall be placed at an easily accessible point outside the installation room.

#### **Article 16.06**

##### **Forced-air heating appliances**

Forced-air heating appliances consisting of a combustion chamber around which the heating air is conducted under pressure to a distribution system or to a room shall meet the following requirements:

(a) If the fuel is atomised under pressure the combustion air shall be supplied by a blower;

(b) The combustion chamber shall be well ventilated before the burner can be lit. Ventilation may be considered complete when the combustion air blower continues to operate after the flame has gone out;

(c) The fuel supply shall be automatically cut off if:

- the fire goes out;
- the supply of combustion air is not sufficient;
- the heated air exceeds a previously set temperature; or
- the power supply of the safety devices fails;
- in the above cases the fuel supply shall not be re-established automatically after being cut off;

- (d) It shall be possible to switch off the combustion air and heating air blowers from outside the room where the heating appliance is located;
- (e) Where heating air is drawn from outside, the intake vents shall be located as far as possible above the deck. They shall be installed in such a manner that rain and spray water cannot enter;
- (f) Heating air pipes shall be made of metal;
- (g) It shall not be possible to close the heating air outlet apertures completely;
- (h) It shall not be possible for any leaking fuel to reach the heating air pipes;
- (i) It shall not be possible for forced-air heating appliances to draw their heating air from an engine room.

**Article 16.07**  
**Solid fuel heating**

1. Solid fuel heating appliances shall be placed on a metal plate with raised edges such that no burning fuel or hot cinders fall outside the plate.

This requirement does not apply to appliances installed in compartments built of non-combustible materials and intended solely to house boilers.

2. Solid fuel boilers shall be fitted with thermostatic controls to regulate the flow of combustion air.

3. A means by which cinders can be quickly doused shall be placed in the vicinity of each heating appliance.”

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