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Working Party on the Transport
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Joint Meeting of Experts on the Regulations
annexed to the European Agreement concerning
the International Carriage of Dangerous Goods
by Inland Waterways (ADN)*
(Sixth session, Geneva, 27-30 May 2002)

AMENDMENTS TO 9.1.0.40.2, 9.3.1.40.2, 9.3.2.40.2 AND 9.3.3.40.2**

Note by the secretariat

The following amendments to 9.1.0.40.2, 9.3.1.40.2, 9.3.2.40.2 and 9.3.3.40.2 were proposed by the Government of Austria in informal document INF.11 at the fifth session of the Joint Meeting of Experts. They were adopted by the Meeting, but since informal document INF.11 is available in French and German only, the secretariat reproduces these amendments in this official document for confirmation, in particular with reference to the English and Russian versions.

* This meeting is organized jointly by the Economic Commission for Europe and the Central Commission for the Navigation of the Rhine.

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9.1.0.40.2

9.3.1.40.2

9.3.2.40.2

9.3.3.40.2 *Read:*

In addition, the engine rooms shall be provided with a permanently fixed fire-extinguishing system meeting the following requirements:

9.1.0.40.2.1

9.3.1.40.2.1

9.3.2.40.2.1 Extinguishing agents

9.3.3.40.2.1 For the protection of spaces in engine rooms, boiler rooms and pump rooms, only permanently fixed fire-extinguishing systems using the following extinguishing agents are permitted:

- (a) CO₂ (carbon dioxide);
- (b) HFC 227 ea (heptafluoropropane);
- (c) IG-541 (53% nitrogen, 40% argon, 8% carbon dioxide).

Other extinguishing agents are permitted only on the basis of recommendations by the Administrative Committee.

... 40.2.2 Ventilation, air extraction

(a) The combustion air required by the combustion engines which ensure propulsion should not come from spaces protected by permanently fixed fire-extinguishing systems. This requirement is not mandatory if the vessel has two independent main engine rooms with a gastight separation or if, in addition to the main engine room, there is a separate engine room installed with a bow thruster that can independently ensure propulsion in the event of a fire in the main engine room;

(b) All forced ventilation systems in the space to be protected shall be shut down automatically as soon as the fire-extinguishing system is activated;

(c) All openings in the space to be protected which permit air to enter or gas to escape shall be fitted with devices enabling them to be closed rapidly. It shall be clear whether they are open or closed;

(d) Air escaping from the pressure-relief valves of the pressurized air tanks installed in the engine rooms shall be evacuated to the open air;

(e) Overpressure or negative pressure caused by the diffusion of the extinguishing agent shall not destroy the constituent elements of the space to be protected. It shall be possible to ensure the safe equalization of pressure;

(f) Protected spaces shall be provided with a means of extracting the extinguishing agent. If extraction devices are installed, it shall not be possible to start them up during extinguishing.

... 40.2.3 Fire alarm system

The space to be protected shall be monitored by an appropriate fire alarm system. The alarm signal shall be audible in the wheelhouse, the accommodation and the space to be protected.

... 40.2.4 Piping system

(a) The extinguishing agent shall be routed to and distributed in the space to be protected by means of a permanent piping system. Piping installed in the space to be protected and the reinforcements it incorporates shall be made of steel. This shall not apply to the connecting nozzles of tanks and compensators provided that the materials used have equivalent fire-retardant properties. Piping shall be protected against corrosion both internally and externally;

(b) The discharge nozzles shall be so arranged as to ensure the regular diffusion of the extinguishing agent.

... 40.2.5 Triggering device

(a) Automatically activated fire-extinguishing systems are not permitted;

(b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected;

(c) Triggering devices shall be so installed that they can be activated in the event of a fire and so that the risk of their breakdown in the event of a fire or an explosion in the space to be protected is reduced as far as possible.

Systems which are not mechanically activated shall be supplied from two energy sources independent of each other. These energy sources shall be located outside the space to be protected. The control lines located in the space to be protected shall be so designed as to remain capable of operating in the event of a fire for a minimum of 30 minutes. The electrical installations are deemed to meet this requirement if they conform to the IEC 60331-21:1999 standard.

When the triggering devices are so placed as not to be visible, the component concealing them shall carry the “Fire-fighting system” symbol, each side being not less than 10 cm in length, with the following text in red letters on a white ground:

“Fire-extinguishing system”

(d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space;

(e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall [be in a language the master can read and understand and if this language is not English, French or German, they shall be in English, French or German. They shall] include information concerning:

- (i) the activation of the fire-extinguishing system;
- (ii) the need to ensure that all persons have left the space to be protected;
- (iii) the correct behaviour of the crew in the event of activation;
- (iv) the correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.

(f) The instructions shall mention that prior to the activation of the fire-extinguishing system, combustion engines installed in the space and aspirating air from the space to be protected, shall be shut down.

... 40.2.6 Alarm device

(a) Permanently fixed fire-extinguishing systems shall be fitted with an audible and visual alarm device;

(b) The alarm device shall be set off automatically as soon as the fire-extinguishing system is first activated. The alarm device shall function for an appropriate period of time before the extinguishing agent is released; it shall not be possible to turn it off;

(c) Alarm signals shall be clearly visible in the spaces to be protected and their access points and be clearly audible under operating conditions corresponding to the highest possible sound level. It shall be possible to distinguish them clearly from all other sound and visual signals in the space to be protected;

(d) Sound alarms shall also be clearly audible in adjoining spaces, with the communicating doors shut, and under operating conditions corresponding to the highest possible sound level;

(e) If the alarm device is not intrinsically protected against short circuits, broken wires and drops in voltage, it shall be possible to monitor its operation;

(f) A sign with the following text in red letters on a white ground shall be clearly posted at the entrance to any space the extinguishing agent may reach:

“Warning, fire-extinguishing system!

Leave this space immediately when the ... (description) alarm is activated!”

... 40.2.7 Pressurized tanks, fittings and piping

(a) Pressurized tanks, fittings and piping shall conform to the requirements of the competent authority;

(b) Pressurized tanks shall be installed in accordance with the manufacturer’s instructions;

(c) Pressurized tanks, fittings and piping shall not be installed in the accommodation;

(d) The temperature of cabinets and storage spaces for pressurized tanks shall not exceed 50° C;

(e) Cabinets or storage spaces on deck shall be securely stowed and shall have vents so placed that in the event of a pressurized tank not being gastight, the escaping gas cannot penetrate into the vessel. Direct connections with other spaces are not permitted.

... 40.2.8 Quantity of extinguishing agent

If the quantity of extinguishing agent is intended for more than one space, the quantity of extinguishing agent available does not need to be greater than the quantity required for the largest of the spaces thus protected.

... 40.2.9 Installation, maintenance, monitoring and documents

(a) The mounting or modification of the system shall only be performed by a company specialized in fire-extinguishing systems. The instructions (product data sheet, safety data sheet) provided by the manufacturer of the extinguishing agent or the system shall be followed;

- (b) The system shall be inspected by an expert:
 - (i) before being brought into service;
 - (ii) each time it is put back into service after activation;
 - (iii) after every modification or repair;
 - (iv) regularly, not less than every two years.

(c) During the inspection, the expert is required to check that the system conforms to the requirements of 9.1.0.40.2/9.3.1.40.2/9.3.2.40.2/9.3.3.40.2;

- (d) The inspection shall include, as a minimum:
 - (i) an external inspection of the entire system;
 - (ii) an inspection to ensure that the piping is leakproof;
 - (iii) an inspection to ensure that the control and activation systems are in good working order;
 - (iv) an inspection of the pressure and contents of tanks;
 - (v) an inspection to ensure that the means of closing the space to be protected are leakproof;
 - (vi) an inspection of the fire alarm system;
 - (vii) an inspection of the alarm device.

(e) The person performing the inspection shall establish, sign and date a certificate of inspection;

(f) The number of permanently fixed fire-extinguishing systems shall be mentioned in the inspection certificate.

... 40.2.10 Fire-extinguishing system operating with CO₂

In addition to the requirements contained in ... 40.2.1 to ... 40.2.9, fire-extinguishing systems using CO₂ as an extinguishing agent shall conform to the following provisions:

(a) Tanks of CO₂ shall be placed in a gastight space or cabinet separated from other spaces. The doors of such storage spaces and cabinets shall open outwards; they shall be capable of being locked and shall carry on the outside the symbol "Warning: danger," not less than 5 cm high and "CO₂" in the same colours and the same size;

(b) Storage cabinets or spaces for CO₂ tanks located below deck shall only be accessible from the outside. These spaces shall have an artificial ventilation system with extractor hoods and shall be completely independent of the other ventilation systems on board;

(c) The level of filling of CO₂ tanks shall not exceed 0.75 kg/l. The volume of depressurized CO₂ shall be taken to be 0.56 m³/kg;

(d) The concentration of CO₂ in the space to be protected shall be not less than 40% of the gross volume of the space. This quantity shall be released within 120 seconds. It shall be possible to monitor whether diffusion is proceeding correctly;

(e) The opening of the tank valves and the control of the diffusing valve shall correspond to two different operations;

(f) The appropriate period of time mentioned in ... 40.2 (b) shall be not less than 20 seconds. A reliable installation shall ensure the timing of the diffusion of CO₂.

... 40.2.11 HFC-227 ea (heptafluoropropane)

In addition to the requirements of ... 40.2.1 to ... 40.2.9, fire-extinguishing systems using HFC-227 ea as an extinguishing agent shall conform to the following provisions:

(a) Where there are several spaces with different gross volumes, each space shall be equipped with its own fire-extinguishing system;

(b) Every tank containing HFC-227 ea placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;

(c) Every tank shall be fitted with a device permitting control of the gas pressure;

(d) The level of filling of tanks shall not exceed 1.15 kg/l. The specific volume of depressurized HFC-227 ea shall be taken to be 0.1374 m³/kg;

(e) The concentration of HFC-227 ea in the space to be protected shall be not less than 8% of the gross volume of the space. This quantity shall be released within 10 seconds;

(f) Tanks of HFC-227 ea shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of propellant gas. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;

(g) After discharge, the concentration in the space to be protected shall not exceed 10.5%;

(h) The fire-extinguishing system shall not comprise aluminium parts.

... 40.2.12 IG-541 fire-extinguishing systems

In addition to the requirements of ... 40.2.1 to ... 40.2.9, fire-extinguishing systems using IG-541 as an extinguishing agent shall conform to the following provisions:

(a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;

(b) Every tank containing IG-541 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;

(c) Each tank shall be fitted with a device for checking the contents;

(d) The filling pressure of the tanks shall not exceed 200 bar at a temperature of +15° C;

(e) The concentration of IG-541 in the space to be protected shall be not less than 44% and not more than 50% of the gross volume of the space. This quantity shall be released within 120 seconds.

... 40.2.13 Fire-extinguishing system for physical protection

In order to ensure physical protection in the engine rooms, boiler rooms and pump rooms, fire-extinguishing systems are accepted solely on the basis of recommendations by the Administrative Committee.

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