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## Economic Commission for Europe

### Inland Transport Committee

#### Working Party on the Transport of Dangerous Goods

Joint Meeting of Experts on the Regulations annexed to the  
European Agreement concerning the International Carriage  
of Dangerous Goods by Inland Waterways (ADN)  
(ADN Safety Committee)

#### Thirty-first session

Geneva, 28-31 August 2017

Item 4 (b) of the provisional agenda

**Proposals for amendments to the Regulations annexed to ADN:**

**Other proposals**

## **Proposal for the implementation of the modified concept for explosion protection on board inland waterway vessels**

### **Transmitted by the Central Commission for the Navigation of the Rhine (CCNR)\* \*\***

1. At its thirtieth session, the ADN Safety Committee requested the UNECE and CCNR secretariats to cooperate to ensure that the full list of changes adopted so far and any others that might be proposed by the informal working group on explosion protection on tank vessels could be submitted to the August 2017 session in an appropriate form and in the four working languages (see ECE/TRANS/WP.15/AC.2/62, para. 72).
2. The present document contains that list.

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\* Distributed in German by the Central Commission for the Navigation of the Rhine in document CCNR/ZKR/ADN/WP.15/AC.2/2017/21.

\*\* In accordance with the programme of work of the Inland Transport Committee for 2016-2017 (ECE/TRANS/2016/28/Add.1 (9.3.)).



## Chapter 1.2

1.2.1 In the definition of “*Hold space*”, delete “(when anti-explosion protection is required, comparable to zone 1)”.

1.2.1 Delete the definitions of “*Cargo area*”, “*Part of the cargo area below deck*”, “*Cargo area (main part above deck)*” and “*Cargo area (additional part above deck)*”, including the figures. Add the following definition:

“*Cargo area*: all the following spaces on board tank vessels:

*Space below deck*:

The space between two vertical planes perpendicular to the centre-line plane of the vessel, which comprises cargo tanks, hold spaces, cofferdams, double-hull spaces and double bottoms; these planes normally coincide with the outer cofferdam bulkheads or hold end bulkheads.

*Space above deck*: the space which is bounded:

- Athwart, by ships vertical planes corresponding to the side plating;
- Fore and aft, by vertical planes at the height of the outer cofferdam bulkheads/hold end bulkheads;
- Upwards, by a horizontal plane 2.50 m above deck.

The boundary planes fore and aft are referred to as the ‘boundary planes of the cargo area’;”.

1.2.1 In the definition of “Classification of zones”, replace “Classification of zones” by “Classification of explosion danger areas”.

At the end of the definition, add: “See also classification of zones”.

1.2.1 In the definition of “Limited explosion risk electrical apparatus”:

- In the first sentence, replace the words “the required temperature class” by “200 °C”.
- Amend the final paragraph to read as follows: “or means an electrical apparatus with an enclosure protected against water jets (protection rating IP55 or higher) which during normal operation does not exhibit surface temperatures of above 200 °C.”.

1.2.1 Delete the definition “Certified safe type electrical apparatus”.

1.2.1 In the definition of “Explosion danger areas”, add the following sentence at the end: “Explosion danger areas are classified into zones by frequency of occurrence and duration of the presence of an explosive atmosphere. See also ‘Classification of explosion danger areas’, ‘Explosion protection’, ‘Classification of zones’ for tank vessels and ‘Protected area’ for dry cargo vessels.”.

1.2.1 In the definition of “Flame arrester”, amend the final sentence to read as follows:

“The flame arrester shall be tested according to the international standard ISO 16852:2010<sup>1</sup> and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied;”.

1.2.1 Amend the definition of “*Gas detection system*” to read as follows:

“*Gas detection system*: a steady state monitoring system capable of detecting in time significant concentrations of flammable gases at concentrations below their lower explosion limit (LEL) and capable of activating the alarms when a limiting value is exceeded. It has to be calibrated at least for n-Hexane. The threshold level of the sensors shall be set at not more than 10 % of the LEL of n-Hexane.

<sup>1</sup> Identical to EN ISO 16852:2010.

<sup>2</sup> Official Journal of the European Communities No. L 23 of 26 February 2014, S. 309.

<sup>3</sup> A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.

It shall be certified according to IEC/EN<sup>4</sup> 60079-29-1:2011 and, with electronically driven systems, also according to EN 50271:2011. If it is used in explosion danger areas, it shall also comply with the requirements for use in the zone concerned and evidence of such compliance (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> the IECEx System,<sup>5</sup> ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied;”.

1.2.1 Amend the definition of “*Flammable gas detector*” to read as follows:

“*Gas detector*: a portable device allowing measurement of any significant concentration of flammable gases below the LEL and which clearly indicates the concentration of such gases. Gas detectors may be designed for measuring flammable gases only, but also for measuring both flammable gases and oxygen. This device shall be so designed that measurements are possible without the necessity of entering the spaces to be checked.

The detection level of the sensors is 5 % of the LEL of the most critical substance in the vessel substance list as a maximum. The flammable gas detector shall be certified according to IEC/EN<sup>4</sup> 60079-29-1:2011. If it is used in explosion danger areas, it shall also comply with the requirements for use in the zone concerned and evidence of such compliance (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> the IECEx System,<sup>5</sup> ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied;”.

1.2.1 In the definition of “*Protected area*”:

- At the beginning, add the following sentence: “The whole of the following spaces on board of dry cargo vessels:”.
- Delete “comparable to” (twice).

1.2.1 Amend the definition of “*High-velocity vent valve*” to read as follows:

“*High-velocity vent valve* means a pressure relief valve designed to have nominal flow velocities which exceed the flame velocity of the explosive mixture, thus preventing flame transmission. When the vessel substance list according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, this pressure relief device shall be tested in accordance with international standard ISO 16852:2010<sup>1</sup> and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied;”.

1.2.1 In the definition of “*Cofferdam*”:

- At the beginning of the sentence, delete “(when anti-explosion protection is required, comparable to zone 1)”.
- In the third sentence, after “The bulkhead not facing the cargo area”, add “(outer cofferdam bulkhead)”.
- [Does not apply to the English text.]

1.2.1 In the definition of “*Hold*”:

<sup>4</sup> IEC/EN means: This standard is available as an IEC standard and as a European standard.

<sup>2</sup> Journal of the European Communities No. L 23 of 26 February 2014, S. 309.

<sup>5</sup> <http://iecex.com/rules>.

<sup>3</sup> A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.

<sup>4</sup> IEC/EN means: This standard is available as an IEC standard and as a European standard.

<sup>2</sup> Journal of the European Communities No. L 23 of 26 February 2014, S. 309.

<sup>5</sup> <http://iecex.com/rules>.

<sup>3</sup> A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.

<sup>1</sup> Identical to EN ISO 16852:2010.

<sup>2</sup> Journal of the European Communities No. L 23 of 26 February 2014, S. 309.

<sup>3</sup> A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.

- At the beginning of the sentence, delete “(when anti-explosion protection is required, comparable to zone 1 — see *Classification of zones*)”.

1.2.1 In the definition of “*Cargo tank*”:

- At the beginning of the sentence, delete “(when anti-explosion protection is required, comparable to zone 0)”.

1.2.1 In the definition of “*Opening pressure*”:

- In the first sentence, replace “Chapter 3.2, Table C” by “column (10) of Table C of Chapter 3.2”.
- In the first sentence, replace “high velocity vent valves” by “pressure relief valves/high-velocity vent valves”.

1.2.1 Amend the definition of “*Sampling opening*” to read as follows:

“*Sampling opening* means a closable opening of a cargo tank with a diameter of not more than 0.30 m. When the vessel substance list according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, it shall be deflagration safe, capable of withstanding steady burning for the most critical substance in the vessel substance list and so designed that the opening period will be as short as possible and that it cannot remain open without external intervention.

The deflagration safety shall be tested according to international standard ISO 16852:2010<sup>1</sup> and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied. The deflagration safety may be ensured by an integrated flame arrester plate stack capable of withstanding steady burning or a flame arrester capable of withstanding steady burning (protection against deflagrations);”.

1.2.1 In the definition of “*Cargo pump-room*”:

- At the beginning of the sentence, delete “(when anti-explosion protection is required, comparable to zone 1)”.

1.2.1 Amend the definition of “*Oxygen meter*” to read as follows:

“*Oxygen meter* means a mobile device allowing measuring of any significant reduction of the oxygen content of the air. An oxygen meter may either be a device for measuring oxygen only or part of a combination device for measuring both flammable gas and oxygen. This device shall be so designed that measurements are possible without the necessity of entering the spaces to be checked. It shall be tested according to IEC/EN 50104:2011.<sup>4</sup> If it is used in explosion danger areas, it shall also comply with the requirements for use in the zone concerned and evidence of such compliance (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> the IECEx System,<sup>5</sup> ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied;”.

1.2.1 In the definition of “*Protective suit*”:

- Amend the third sentence to read as follows: “For protective suits, see, for example, ISO 13688:2013).<sup>1</sup>”
- At the end, add the following sentence: “In case of dangers caused by electrostatic charging/discharging, see also European standard EN 1149-5:2008.”.

<sup>1</sup> Identical to EN ISO 16852:2010.

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>3</sup> *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

<sup>4</sup> *IEC/EN means: This standard is available as an IEC standard and as a European standard.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>5</sup> <http://iecex.com/rules>.

<sup>3</sup> *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

<sup>1</sup> Identical to EN ISO 16852:2010.

1.2.1 In the definition of “*Protective gloves*”:

- Amend the third sentence to read as follows: “For protective gloves, see for example European standards EN 374-1:2003, EN 374-2:2015 or EN 374-4:2014.”.
- At the end, add the following sentence: “In case of dangers caused by electrostatic charging/discharging: see also European standard EN 16350:2015.”.

1.2.1 In the definition of “*Protective shoes (or protective boots)*”, the second and third sentences are amended to read as follows: “The choice of appropriate protective shoes or boots shall correspond to the dangers likely to arise, e.g., electrostatic charging/discharging. For protective shoes or boots, see, for example, international standards ISO 20345:2012 or 20346:2014.”.

1.2.1 In the definition of “*Pressure relief device*”, replace “a spring-loaded device which is activated automatically by pressure” by “an automatically activated safety valve”.

1.2.1 Amend the definition of “*Vacuum valve*” to read as follows:

“*Vacuum valve* means an automatically activated safety valve the purpose of which is to protect the cargo tank against unacceptable negative internal pressure.”. When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, it shall be deflagration safe against atmospheric explosions of the most critical substance in the list of substances. The deflagration safety shall be tested according to international standard ISO 16852:2010<sup>1</sup> and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> the IECEx System, ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied. The deflagration safety may be ensured by an integrated flame arrester plate stack or a flame arrester (protection against deflagrations);”

1.2.1 Amend the definition of “*Types of protection*” to read as follows:

“*Types of protection*:

Electrical equipment (see IEC 60079-0:2011 or at least equivalent);

EEEx (d): flameproof enclosure (IEC 60079-1:2014 or at least equivalent);

EEEx (e): increased safety (IEC 60079-7:2015 or at least equivalent);

EEEx (ia) and EEEx (ib): intrinsic safety (IEC 60079-11:2011 or at least equivalent);

EEEx (m): encapsulation (IEC 60079-18:2009 or at least equivalent);

EEEx (p): pressurized apparatus (IEC 60079-2:2014 or at least equivalent);

EEEx (q): powder filling (IEC 60079-5:2007 or at least equivalent);

Non-electrical equipment (see IEC EN 13463-1:2009 or at least equivalent);

EEEx (fr): flow restricting enclosure (EN 13463-2:2005 or at least equivalent);

EEEx (d): flameproof enclosure (EN 13463-3:2005 or at least equivalent);

EEEx (c): constructional safety (EN 13463-5:2011 or at least equivalent);

EEEx (b): control of ignition source (EN 13463-6:2005 or at least equivalent);

EEEx (k): liquid immersion: (EN 13463-8:2003 or at least equivalent);”.

1.2.1 Insert the following new definitions in alphabetical order:

“*Self-contained protection systems* means all devices which are intended to halt incipient explosions immediately and/or to limit the effective range of an explosion and which are separately made available on the market for use as self-contained

<sup>1</sup> Identical to EN ISO 16852:2010.

<sup>2</sup> Journal of the European Communities No. L 23 of 26 February 2014, S. 309.

<sup>3</sup> A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.

systems. This includes flame arresters, high velocity vent valves, deflagration safe vacuum valves and devices for the safe depressurization of cargo tanks capable of withstanding a deflagration (see also *Flame arrester, High velocity vent valve, Vacuum valve, Devices for the safe depressurization of cargo tanks and Deflagration*);”.

“*Explosion protection*: All of the requirements which have to be met and means which have to be taken to avoid damage caused by explosions.

This includes:

Organizational measures such as, for example:

- Assigning explosion danger areas (classification of zones): in which an explosive atmosphere consisting of a mixture with air of flammable gases, vapours or sprays is likely to occur:

- (a) continuously or for long periods or frequently (zone 0);
- (b) occasionally in normal operation (zone 1); or
- (c) exceptionally or only briefly (zone 2);

(see Directive 1999/92/EC<sup>6</sup>).

- Prevention of ignition sources (use of low-sparking hand-tools, no smoking, use of personal protective equipment including dissipative shoes, non-isolating gloves, etc.);
- Drafting of working instructions.

And technical requirements such as, for example:

- Use of installations and equipment proven to be appropriate for use in the different explosion danger areas;
- Use of self-contained protection systems;
- Monitoring of potentially explosive atmospheres by the use of gas detection systems and gas detectors;”.

“*Equipment* (see Directive 2014/34/EC<sup>2</sup>) means electrical or non-electrical machines, apparatus, fixed or mobile devices, control components and instrumentation thereof and detection or prevention systems which, separately or jointly, are intended for the generation, transfer, storage, measurement, control and conversion of energy and/or the processing of material and which are capable of causing an explosion through their own potential sources of ignition.

Equipment which is assigned a UN number and transported as cargo is not included;”.

“*Equipment intended for use in explosion danger areas* means electrical and non-electrical equipment where measures are taken to prevent the equipment’s own ignition sources becoming effective. Such equipment shall comply with the requirements for use within the respective zone. It shall be tested according to the type of protection and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> the IECEx-System,<sup>5</sup> ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied;”.

“*Equipment category* (see Directive 2014/34 EC<sup>2</sup>) means the classification of equipment to be used within explosion danger areas determining the requisite level of protection to be ensured.

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<sup>6</sup> *Journal of the European Communities No. L 23 of 28 January 2000, S. 57.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>5</sup> <http://iecex.com/rules>.

<sup>3</sup> *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

Equipment category 1 comprises equipment designed to be capable of functioning in conformity with the operational parameters established by the manufacturer and ensuring a very high level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are present continuously, for long periods or frequently.

Equipment in this category must ensure the requisite level of protection, even in the event of rare incidents relating to equipment, and is characterized by means of protection such that:

- Either, in the event of failure of one means of protection, at least one independent second means provides the requisite level of protection; or
- Or the requisite level of protection is assured in the event of two faults occurring independently of each other.

Equipment of category 1 according to Directive 2014/34/EC<sup>2</sup> is marked as II 1 G. Such equipment corresponds to EPL<sup>7</sup> ‘Ga’ according to IEC 60079-0.

Equipment of category 1 is suitable for use in zones 0, 1 and 2.

Equipment category 2 comprises equipment designed to be capable of functioning in conformity with the operational parameters established by the manufacturer and of ensuring a high level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are likely to occur occasionally.

The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.

Equipment of category 2 according to Directive 2014/34/EC<sup>2</sup> is marked as II 2 G. Such equipment corresponds to EPL<sup>7</sup> ‘Gb’ according to IEC 60079-0.

Equipment category 2 is suitable for use in zones 1 and 2.

Equipment category 3 comprises equipment designed to be capable of functioning in conformity with the operating parameters established by the manufacturer and ensuring a normal level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short period only.

Equipment in this category ensures the requisite level of protection during normal operation.

Equipment of category 3 according to Directive 2014/34/EC<sup>2</sup> is marked as II 3 G. Such equipment corresponds to EPL<sup>7</sup> ‘Gc’ according to IEC 60079-0.

Equipment of category 3 is suitable for use in zone 2.”

“*Equipment protection level (EPL<sup>7</sup> (see IEC 60079-0))* means the level of protection assigned to equipment based on its likelihood of becoming a source of ignition.

EPL ‘Ga’:

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>7</sup> *The letters EPL mean: Equipment Protection Level.*

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Equipment with a ‘very high’ level of protection. Such equipment corresponds to equipment category 1 according to Directive 2014/34/EC.<sup>2</sup>

Equipment with the ‘Ga’ level of protection is suitable for use in zones 0, 1 and 2.

EPL ‘Gb’:

Equipment with a ‘high’ level of protection. Such equipment corresponds to equipment category 2 according to Directive 2014/34/EC.<sup>2</sup>

Equipment with the ‘Gb’ level of protection is suitable for use in zones 1 and 2.

EPL ‘Gc’:

Equipment with an ‘enhanced’ level of protection. Such equipment corresponds to equipment category 3 according to Directive 2014/34/EC.<sup>2</sup>

Equipment with the ‘Gc’ level of protection is suitable for use in zone 2;”.

“*Ullage opening* means a closable opening of the residual cargo tanks with a diameter of maximum 0.10 m. The ullage opening shall be designed in such a way that it is possible to determine the degree of filling by the use of gauging rods;”.

“*Oxygen measuring system* means a steady-state monitoring device capable of detecting in time any significant reduction of oxygen content of the air and capable of activating the alarms in case the oxygen concentration reaches 19.5 % by volume.

This device shall be tested according to the European standard IEC/EN<sup>4</sup> 50104:2011. If it is used in explosion danger areas, it shall also comply with the requirements for use in the zone concerned and evidence of such compliance (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> the IECEx System,<sup>5</sup> ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied.

An oxygen measuring system may also be designed as part of a combination device for measuring both flammable gas and oxygen;”.

“*Protective coaming, liquid-tight* means a liquid-tight coaming on deck at the height of the outer cargo tank bulkhead (see zoning diagram), but at a maximum distance of 0.60 m to the outer cofferdam bulkhead or hold end bulkheads, which prevents liquid from entering the fore and aft parts of the vessel. The connection between the protective coamings and the spill coaming shall be liquid tight;”.

“*Protection wall, gas- and liquid-tight* means a gas- and liquid-tight wall on deck at the height of the boundary plane of the cargo area preventing gases from entering areas outside the cargo area;”.

“*Spill coaming* means a coaming on deck of the vessel parallel to the side plating with closable openings, to prevent spillage of liquids overboard. The connection to the protective coamings, if installed, shall be liquid tight;”.

“*Device for the safe depressurization of cargo tanks* means a manually operated or remote-operated device which is mounted in such a way as to allow the cargo tanks to be depressurized in complete safety. When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the device shall be deflagration safe and capable of withstanding steady burning for the most critical substance in the vessel substance list. The deflagration safety shall be tested according to international standard ISO 16852:2010<sup>1</sup> and evidence of

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>4</sup> *IEC/EN means: This standard is available as an IEC standard and as a European standard.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>5</sup> <http://iecex.com/rules>

<sup>3</sup> *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

<sup>1</sup> *Identical to EN ISO 16852:2010*



compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EC,<sup>2</sup> the IECEx System, ECE/TRADE/391<sup>3</sup> or at least equivalent) shall be supplied. The deflagration safety may be ensured by an integrated flame arrester plate stack capable of withstanding steady burning or a flame arrester capable of withstanding steady burning (protection against deflagrations);”.

“Classification of zones: this classification (see diagram) applies to tank vessels when the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2.

**Zone 0** comprises:



- Inside all cargo tanks, residual cargo and slop tanks, and pipings containing cargoes or cargo vapours, including their equipment, as well as pumps and compressors.

**Zone 1** comprises:



- All spaces located below deck in the cargo area not part of zone 0.
- Closed spaces on deck within the cargo area.
- The deck in the cargo area over the entire width of the vessel to the outer cofferdam bulkheads.
- Up to a distance of at least 1.60 m to the “boundary planes of the cargo area”, the height above the deck is 2.50 m, but at least 1.50 m above the highest piping carrying cargoes or cargo vapours.

Every opening in zone 0 except the high velocity vent valves/safety valves of pressurized cargo tanks shall be surrounded by an annulus zone 1 having at least a width of 2.50 m. With openings of which the diameter is less than 0.026 m (1”), the distance to the outer cofferdam bulkhead may be reduced to 0.50 m, provided it is ensured that such an opening is not opened to the atmosphere within this distance.

Adjacent (fore and aft) to the outermost cargo tank shots, the height is 0.25 m above deck.

If the ship is built with hold spaces or a cofferdam/ part of a cofferdam is arranged as a service space, the adjacent height (fore and aft) to the “boundary plane of the cargo area” is 1.00 m above deck (see diagram).

- A cylindrical area surrounding the high velocity vent valve/safety valve of pressurized cargo tanks with a radius of 3.00 m up to a height of 4.00 m above the opening of the high velocity vent valve/safety valve of pressurized cargo tanks.
- Around ventilation inlets of service spaces fitted with a ventilation system located in the cargo area, a zone included in a portion of a sphere with a radius of 1.00 m.

**Zone 2** comprises:



- On the deck in the cargo area, a zone extending 1.00 m upwards and joining zone 1 longitudinally.
- On the fore deck and the aft deck, an area 7.50 m in length across the entire width of the vessel and adjacent to the “boundary plane of the cargo area”. Between the lateral side of the vessel and the protection wall, the length and height of this area equals the dimensions of the lateral side of the protection wall. Elsewhere, the height in zone 2 is 0.50 m.

This area is not part of zone 2 if the protection wall extends from one side of the vessel to the other and there are no openings.

- An area of 3.00 m around zone 1 encompassing the high velocity vent valves/safety valves of pressure cargo tanks.

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>3</sup> *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

- Around the ventilation inlets of service spaces fitted with a ventilation system located in the cargo area, a zone included in a hemispherical shell with a radius of 1.00 m surrounding zone 1;”.

### Chapter 1.3

1.3.2 Insert the following new sub-section 1.3.2.5:

“1.3.2.5 Working instructions concerning explosion protection

The safety training referred to in 1.3.2.3 shall be supplemented by working instructions concerning explosion protection.”.

### Chapter 1.4

1.4.2.2.1 (f) Amend to read as follows:

“(f) Ensure that, within the explosion danger areas on board the vessel, only electrical and non-electrical installations and equipment that meet the requirements for use in the relevant zone are used;”.

1.4.3.3 (r) After “prescribed in 7.2.4.25.5”, insert “and when explosion protection is necessary according to column (17) of Table C of Chapter 3.2”.

1.4.3.3 (r) At the end, before the semicolon, add: “corresponding at least to the explosion group/subgroup in column (16) of Table C of Chapter 3.2;”.

1.4.3.3 (s) Replace “of the gas discharge pipe or the compensation pipe” by “of the compensation pipe/gas discharge pipe”.

1.4.3.3 (s) Replace “the opening pressure of the high velocity vent valve” by “the opening pressure of the pressure relief valve/high velocity vent valve”.

1.4.3.7.1 (i) Amend to read as follows:

“(i) Ascertain that, when a connection to the gas discharge pipe is required and when explosion protection is required according to column (17) of Table C of Chapter 3.2, there is a flame arrester in the gas return pipe to protect the vessel against detonations and flame-fronts from the landward side which corresponds at least to the explosion group/subgroup in column (16) of Table C of Chapter 3.2;”.

1.4.3.7.1 (j) Replace “of the gas discharge pipe or the gas return pipe” by “of the gas discharge pipe/gas return pipe”.

1.4.3.7.1 (j) Replace “the opening pressure of the high velocity vent valve” by “the opening pressure of the pressure relief valve/high velocity vent valve”.

### Chapter 1.6

1.6.7.2.1.1 Add the following new transitional provisions:

“

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
7.1.2.19.1	Vessels necessary to provide propulsion Adaptation to the new requirements in 9.1.0.12.4, 9.1.0.40.2, 9.1.0.51 and 9.1.0.52	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034 Until that date, the requirements of 7.2.2.19.1 of the version of ADN in force until 31 December 2018 apply to vessels in service.

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
7.1.3.41	Smoking	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2020
7.1.3.51.1	Non-electrical installations and equipment	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024
7.1.3.51.5	Disconnection of installations and equipment marked in red	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
7.1.3.51.5	Installations and equipment generating surface temperatures of above 200 °C	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
7.1.4.53	Lighting appliances in explosion danger areas of zone 2	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2022
8.1.2.2 (e)-(h)	Documents which must be available on board	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2020
8.6.1.1 8.6.1.2	Changes to certificate of approval	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2018
9.1.0.12.3	Ventilation of accommodation and wheelhouse	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.12.3	Equipment in the accommodation, wheelhouse and service spaces where surface temperatures can be higher than those mentioned under 9.1.0.51 or where electrical installations and equipment which do not meet the requirements of 9.1.0.52.1 are used.	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.12.4	Ventilation inlets	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.12.5	Ventilators used in the protected area and hold ventilators which are arranged in the air flow:  Temperature class and explosion group	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.51	Temperature of outer parts of engines and of their air inlets and exhaust ducts	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.52.1	Electrical installations in operation during a stay in the immediate vicinity of or within an onshore assigned zone.	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
9.1.0.52.1	Electrical installations, equipment and appliances located outside the protected area	<p>N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034</p> <p>Until that date, the following requirements are applicable on board vessels in service:</p> <p>It shall be possible to isolate the electrical equipment in the protected area by means of centrally located switches except where:</p> <ul style="list-style-type: none"> <li>• In the holds it is of a certified safe type corresponding at least to temperature class T4 and explosion group II B; and</li> <li>• In the protected area on the deck it is of the limited explosion risk type.</li> </ul> <p>The corresponding electrical circuits shall have control lamps to indicate whether or not the circuits are live.</p> <p>The switches shall be protected against unintended unauthorized operation. The sockets used in this area shall be designed so as to prevent connection or disconnection except when they are not live. Submerged pumps installed or used in the holds shall be of the certified safe type at least for temperature class T4 and explosion group II B.</p>
9.1.0.52.2	Installations and equipment marked in red	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.52.5	Failure of the power supply for the safety and control equipment	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.1.0.53.6	Non-electrical installations and equipment within the protected area	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
1.6.7.2.2.2	Add the following new transitional provisions: “	
<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
1.2.1	Cargo area Spatial extent above the deck	<p>N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034</p> <p>Until that date, the following requirements are applicable on board vessels in service:</p> <p>The spatial extent corresponds to a rectangular pyramidal frustum with the following dimensions:</p>

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
		Floor area: from board to board and from outer cofferdam bulkhead to outer cofferdam bulkhead
		Angle of slope of the short sides: 45°
		Angle of slope of the long sides: 90°
		Height: 3.00 m
		Spatial extent of zone 1 corresponds to the cargo area above the deck
1.2.1	Flame arrester	N.R.M. from 1 January 2019
	Proof of conformity with applicable requirements	Renewal of the certificate of approval after 31 December 2034
1.2.1	Gas detection system	N.R.M. from 1 January 2019
	Test according to IEC 60079-29-1:2011 and EN 50271:2011	Renewal of the certificate of approval after 31 December 2024
1.2.1	Gas detector	N.R.M. from 1 January 2019
	Test according to IEC 60079-29-1:2011	Renewal of the certificate of approval after 31 December 2020
1.2.1	Sampling opening	N.R.M. from 1 January 2019
	Deflagration safety	Renewal of the certificate of approval after 31 December 2034
	Test according to ISO 16852:2010 or EN ISO 16852:2010/Proof of conformity with applicable requirements	The deflagration safety of the sampling opening shall be tested according to EN 12874:2001 including the manufacturer's confirmation under Directive 94/9/EC or at least equivalent on board vessels built or modified from 1 January 2001 or if the sampling opening has been replaced since 1 January 2001. In other cases, they shall be of a type approved by the competent authority for the use prescribed.
1.2.1	Oxygen measuring system	N.R.M. from 1 January 2019
	Test according to EN 50104:2011, etc.	Renewal of the certificate of approval after 31 December 2020
1.2.1	Oxygen meter	N.R.M. from 1 January 2019
	Test according to EN 50104:2011	Renewal of the certificate of approval after 31 December 2020
1.2.1	Device for the safe depressurization of cargo tanks	N.R.M. from 1 January 2019
	Deflagration safety	Renewal of the certificate of approval after 31 December 2034
	Test according to ISO 16852:2010 or EN ISO 16852:2010/Proof of conformity with applicable requirements	The deflagration safety shall be tested according to EN 12874:2001 including the manufacturer's confirmation under Directive 94/9/EC on board vessels built or modified from 1 January 2001 or if the safe pressure-relief device for the cargo tanks has been replaced since 1 January 2001. In other cases, they shall be of a

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
		type approved by the competent authority for the use prescribed.
1.2.1	Classification in zones	N.R.M. from 1 January 2019
	Zone 1	Renewal of the certificate of approval after 31 December 2034
	Spatial extent	Until that date, the following requirements are applicable on board vessels in service: the spatial extent of zone 1 corresponds to a rectangular pyramidal frustum with the following dimensions:  Floor area: from board to board and from outer cofferdam bulkhead to outer cofferdam bulkhead  Angle of slope of the short sides: 45°  Angle of slope of the long sides: 90°  Height: 3.00 m
	Zone 2	N.R.M. from 1 January 2019
	Spatial extent:	Renewal of the certificate of approval after 31 December 2034
7.2.2.6	Calibration of gas detection system for n-Hexane	N.R.M. from 1 January 2019  Renewal of the certificate of approval after 31 December 2020
7.2.2.19.4	Vessels of the formation for which explosion protection is required	N.R.M. from 1 January 2019  Renewal of the certificate of approval after 31 December 2034  Until that date, the requirements of 7.2.2.19.3 of the version of ADN in force until 31 December 2018 apply to vessels in service.
7.2.3.41	Smoking	N.R.M. from 1 January 2019  Renewal of the certificate of approval after 31 December 2020
7.2.3.51.4	Disconnection of non-electrical installations and equipment marked in red	N.R.M. From 1 January 2019  Renewal of the certificate of approval after 31 December 2034
7.2.3.51.5	Surface temperature where T4, T5 or T6 are required	N.R.M. From 1 January 2019  Renewal of the certificate of approval after 31 December 2020
7.2.4.25.5	Explosion group/subgroup	N.R.M. From 1 January 2019  Renewal of the certificate of approval after 31 December 2024
8.1.2.3 (r), (s), (t), (v)	Documents which must be available on board	N.R.M. from 1 January 2019  Renewal of the certificate of approval after 31 December 2020  Until that date, in addition to the documents required in accordance with

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
		1.1.4.6, the following documents are required:
		(a) A plan indicating the boundaries of the cargo area and the location of the electrical equipment installed in that area;
		(b) A list of the machinery, appliances or other electrical equipment referred to in (a) above, including the following particulars: <p style="margin-left: 40px;">machinery or appliance, location, type of protection, type of explosion protection, testing body and approval number;</p>
		(c) A list of or general plan indicating the electrical equipment located outside the cargo area which may be operated during loading, unloading or gas-freeing.
		The documents listed above shall bear the stamp of the competent authority issuing the certificate of approval.
8.1.2.3 (u)	Documents which must be available on board  Plan with classification of zones	N.R.M. from 1 January 2019  Renewal of the certificate of approval after 31 December 2034
8.1.7.2	Installations, equipment and self-contained protection systems, testing of installations, equipment and self-contained protection systems as well as compliance with the documents referred to in 8.1.2.3 (r) to (v) in respect of the situation on board	N.R.M. from 1 January 2019  Renewal of the certificate of approval after 31 December 2020
8.1.7.2	Marking of installations and equipment to be used in explosion danger areas as well as of self-contained protection systems	N.R.M. From 1 January 2019  Renewal of the certificate of approval after 31 December 2024
8.6.1.3	Change to certificate of approval	N.R.M. from 1 January 2019
8.6.1.4		Renewal of the certificate of approval after 31 December 2018
9.3.1.8.3	Verification of the oxygen measuring system	N.R.M. from 1 January 2019
9.3.2.8.3		Renewal of the certificate of approval after 31 December 2020
9.3.3.8.3		
9.3.1.8.4	Compliance with the documents in 8.1.3.2 (r) to (v)	N.R.M. from 1 January 2019
9.3.2.8.4		Renewal of the certificate of approval after 31 December 2018
9.3.3.8.4		
9.3.1.10.1	Penetration of gases and liquids into the wheelhouse	N.R.M. from 1 January 2019
9.3.2.10.1		

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
9.3.3.10.1	Windows that can be opened	Renewal of the certificate of approval after 31 December 2024
9.3.1.10.2	Height of protective coaming	N.R.M. from 1 January 2019
9.3.2.10.2		Renewal of the certificate of approval after 31 December 2020
9.3.3.10.2		
9.3.1.12.4	Ventilation of the wheelhouse	N.R.M. from 1 January 2019
9.3.2.12.4		Renewal of the certificate of approval after 31 December 2024
9.3.3.12.4		
9.3.1.12.4	Equipment in the accommodation, wheelhouse	N.R.M. from 1 January 2019
9.3.2.12.4	and service spaces where	Renewal of the certificate of approval after 31 December 2034
9.3.3.12.4	surface temperatures can be higher than those mentioned in 9.3.x.51 (a)	
9.3.1.12.4	Equipment in the wheelhouse	N.R.M. from 1 January 2019
9.3.2.12.4	where surface temperatures can be higher than those	Renewal of the certificate of approval after 31 December 2034
9.3.3.12.4	mentioned in 9.3.x.51 (a) or involving the use of electrical equipment which does not meet the requirements of 9.3.x.52.1	
9.3.1.12.4	Electrical installations and	N.R.M. From 1 January 2019
9.3.3.12.4	equipment used during loading, unloading, gas-freeing and when in the immediate vicinity of or within an onshore assigned zone.	Renewal of the certificate of approval after 31 December 2034  Until that date, on board type G and type N vessels whose keels were laid before 1 January 1977, all electrical equipment except the lighting installations in accommodation, radio telephone installations in the accommodation and the wheelhouse and combustion engine control appliances, shall meet the following requirements:  Generators, engine, etc.: IP 13 protection mode  Switchboards, switches near entrances to accommodation, etc.: IP23 protection mode  Appliances, etc.: IP 55 protection mode.
9.3.1.12.4	Non-electrical installations and	N.R.M. From 1 January 2019
9.3.2.12.4	equipment used during	Renewal of the certificate of approval after 31 December 2034
9.3.3.12.4	loading, unloading, degassing and when in the immediate vicinity of or within an onshore assigned zone.	
9.3.1.12.4 (b)	Gas detection system: T90-time	N.R.M. From 1 January 2019
9.3.2.12.4 (b)		Renewal of the certificate of approval after 31 December 2034
9.3.3.12.4 (b)		
9.3.1.12.4	Alarms outstanding	N.R.M. From 1 January 2019



<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
9.3.2.12.4 9.3.3.12.4		Renewal of the certificate of approval after 31 December 2024
9.3.1.12.6 9.3.2.12.6 9.3.3.12.6	Distance between ventilation inlets in the wheelhouse and the cargo area	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.17.6 9.3.2.17.6 9.3.3.17.6	Distance between the ventilation inlets in the pump-room and the wheelhouse	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.17.6 9.3.2.17.6 9.3.3.17.6	Oxygen measuring system Minimum value for the alarm	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2020
9.3.1.17.6 9.3.2.17.6 9.3.3.17.6	Alarms outstanding	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.3.1.21.7 9.3.2.21.7 9.3.3.21.7	Alarms outstanding	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.3.2.20.4 9.3.3.20.4	Explosion group/subgroup	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.3.2.21.1 (g) 9.3.3.21.1 (g)	Explosion group/subgroup	N.R.M. From 1 January 2019 Renewal of certificate of approval after 31 December 2024
9.3.2.22.4 (d) 9.3.3.22.4 (e)	Explosion group/subgroup	N.R.M. From 1 January 2019 Renewal of certificate of approval after 31 December 2024
9.3.2.26.2 9.3.3.26.2 (b)	Explosion group/subgroup	N.R.M. From 1 January 2019 Renewal of certificate of approval after 31 December 2024
9.3.1.51 (a) 9.3.2.51 (a) 9.3.3.51 (a)	The surface temperature of non-electrical installations and equipment shall not exceed 200 °C	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.52.1 9.3.2.52.1 9.3.3.52.1	Electrical installations and equipment of the limited explosion risk type.	N.R.M. Renewal of certificate of approval after 31 December 2034 Until that date, the following documents are required for electrical equipment used during loading, unloading and gas-freeing of vessels in service whose keels were laid after 1 January 1995: 9.3.1.52.3, 9.3.2.52.3 and 9.3.3.52.3 of the version of ADN in force until 31 December 2018.

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
9.3.1.52.1	Electrical installations and equipment of the limited explosion risk type.	N.R.M.
9.3.3.52.1		<p>Renewal of the certificate of approval after 31 December 2034</p> <p>Until that date, on board vessels whose keels were laid before 1 January 1977, all electrical equipment except the lighting installations in the accommodation, radio telephone installations in the accommodation and the wheelhouse and combustion engine control appliances in use during loading, unloading and gas-freeing shall meet the following requirements:</p> <p>Generators, engines, switchboards, lighting, etc.: IP 13 protection mode</p> <p>Appliances, etc.: IP 55 protection mode.</p>
9.3.1.53.1	Type and location of electrical installations and equipment	N.R.M. from 1 January 2019
9.3.2.53.1	intended to be used in	Renewal of certificate of approval after 31 December 2034
9.3.3.53.1	explosion danger areas	Until that date, the following requirements are applicable:
	Zone 0, Zone 1	<p>(a) In cargo tanks and piping for loading and unloading, only measuring, regulation and alarm devices of the EEx (ia) type of protection may be installed.</p> <p>(b) Electrical equipment on deck in the cargo area and the measuring, regulation and alarm apparatus, motors driving essential equipment such as ballast pumps in the cofferdams, double-hull spaces, double bottoms, hold spaces and service spaces below deck in the cargo area shall be checked and approved by the competent authority with respect to the safety of operation in an explosive atmosphere, for example, intrinsically safe apparatus, flameproof enclosure apparatus, apparatus protected by pressurization, powder filling apparatus, apparatus protected by encapsulation and increased safety apparatus.</p>

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
		<p>(c) In the cofferdams, double-hull spaces, double bottoms, hold spaces and service spaces below deck in the cargo area, the lighting appliances must have the “flame-proof enclosure” or “apparatus protected by pressurization” type of protection.</p> <p>(d) The control and protective equipment of the equipment referred to in (a), (b) and (c) above shall be located outside the cargo area if they are not intrinsically safe.</p> <p>For the selection of electrical equipment, the explosion groups and temperature classes assigned to the substances carried in the list of substances shall be taken into consideration (see columns (15) and (16) of Table C in 3.2).</p> <p>Until that date, the following requirements are applicable on board vessels in service as at 1 January 2019 whose keels were laid after 31 December 1977:</p> <p>Until that date, the following conditions shall be met during loading, unloading and gas freeing on board vessels having non-gastight wheelhouse openings (e.g. doors, windows, etc.) in the cargo area:</p> <p>(a) All electrical equipment to be used in the wheelhouse shall be of a limited explosion-risk type, i.e., it shall be so designed that there is no sparking and the temperature of its outer surface does not rise above 200 °C during normal operation, or it shall be of a type protected against water jets and designed in such a way that its surface temperature may not exceed 200 °C during normal operation.</p> <p>(b) Electrical equipment which does not meet the requirements of (a) above shall be marked in red and it shall be possible to switch it off by means of a central switch.</p>
9.3.1.53.1	Type and location of electrical installations and equipment	N.R.M. from 1 January 2019
9.3.2.53.1	intended to be used in	Renewal of the certificate of approval
9.3.3.53.1	explosion danger areas	after 31 December 2034
	Zone 2	

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
9.3.1.53.1	Temperature class and explosion group of non-electrical installations and equipment	N.R.M. From 1 January 2019
9.3.2.53.1		Renewal of the certificate of approval after 31 December 2034
9.3.3.53.1		
9.3.1.53.1	Temperature class and explosion group of electrical installations and equipment	N.R.M. From 1 January 2019
9.3.2.53.1		Renewal of the certificate of approval after 31 December 2034
9.3.3.53.1		

1.6.7.2.2.2 Amend the following entries in the table to read as follows:

“

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
1.2.1	Flame arrester	N.R.M. from 1 January 2017
	Test according to ISO 16852:2010 or EN ISO 16852:2010.	Renewal of the certificate of approval after 31 December 2034
		Until that date, the following requirements are applicable on board vessels in service:
		Flame arresters shall be tested according to EN 12874:2001 on board vessels built or modified since 1 January 2001 or if they have been replaced since 1 January 2001. In other cases, they shall be of a type approved by the competent authority for the use prescribed.
1.2.1	High velocity vent valve	N.R.M. from 1 January 2017
	Test according to ISO 16852:2010 or EN ISO 16852:2010/ Proof of conformity with applicable requirements	Renewal of the certificate of approval after 31 December 2034
		Until that date, the following requirements are applicable on board vessels in service:
		High velocity vent valves shall be tested according to EN 12874:2001, including the manufacturer's confirmation in line with Directive 94/9/EC, on board vessels built or modified from 1 January 2001 or if they have been replaced from 1 January 2001. In other cases, they shall be of a type approved by the competent authority for the use prescribed.
7.2.2.19.3	Vessels used for propulsion	N.R.M. from 1 January 2019
	Adaptation to new provisions	Renewal of certificate of approval after 31 December 2034
	Provisions of 9.3.3.12.4, 9.3.3.51 and 9.3.3.52.1 to 9.3.3.52.8	
9.3.1.10.3	Protection wall	N.R.M. from 1 January 2019
9.3.2.10.3		Renewal of certificate of approval after 31 December 2024
9.3.3.10.3		

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
9.3.1.10.2	<i>Unchanged</i>	<i>Unchanged</i>
9.3.2.10.2		
9.3.3.10.2		
<i>Amend numbering as follows:</i>		
<b>9.3.1.10.4</b>		
<b>9.3.2.10.4</b>		
<b>9.3.3.10.4</b>		
9.3.1.12.6	Distance between ventilation openings of accommodation and service spaces and the cargo area	N.R.M. from 1 January 2003
9.3.2.12.6		Renewal of certificate of approval after
9.3.3.12.6		31 December 2034
9.3.1.12.6	Permanently installed devices according to 9.3.x.40.2.2 (c)	N.R.M. from 1 January 2003
9.3.2.12.6		Renewal of certificate of approval after
9.3.3.12.6		31 December 2018
9.3.3.12.7	<i>Delete</i>	
9.3.2.22.4 (b)	Set pressure of relief valve/high-velocity vent valve	N.R.M.
9.3.3.22.4 (b)		Renewal of certificate of approval after 31 December 2018
<i>Amend numbering as follows:</i>		
9.3.2.22.4 (a)		<i>Unchanged</i>
9.3.3.22.4 (e)		
9.3.1.22.3	Position of exhaust outlets of pressure relief valves/high velocity vent valves above the deck	N.R.M.
9.3.2.22.4 (b)		Renewal of certificate of approval after
9.3.3.22.4 (b)		31 December 2018
<i>Amend numbering as follows:</i>		
<b>9.3.1.22.3</b>		<i>Unchanged</i>
<b>9.3.2.22.4 (a)</b>		
<b>9.3.3.22.4 (a)</b>		
9.3.1.51.3	<i>Delete</i>	
9.3.2.51.3		
9.3.3.51.3		

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
9.3.1.31.4	Surface temperature of outer parts of engines and of their air inlets and exhaust ducts	N.R.M., Renewal of certificate of approval after 31 December 2018
9.3.2.31.4		Until 31 December 2018, the following provisions are applicable on board vessels in service:  The surface temperature shall not exceed 300 °C.
9.3.3.31.4		
<i>Amend numbering as follows:</i>		
<b>9.3.1.51 (b)</b>		
<b>9.3.2.51 (b)</b>		
<b>9.3.3.51 (b)</b>		
9.3.1.51.2	Visual and audible alarm	N.R.M.
9.3.2.51.2		Renewal of certificate of approval after 31 December 2034
9.3.3.51.2		
<i>Amend numbering as follows:</i>		
<b>9.3.1.52.4</b>	<i>Unchanged</i>	<i>Unchanged</i>
<b>9.3.2.52.4</b>		
<b>9.3.3.52.4</b>		
9.3.1.52.3 (a)	<i>Delete</i>	
9.3.1.52.3 (b)		
9.3.3.52.3 (a)		
9.3.3.52.3 (b)		
9.3.3.52.3 (a)	Electrical installations in operation during a stay in the immediate vicinity of or within an onshore assigned zone.	N.R.M. from 1 January 2019 for open Type N vessels
9.3.3.52.3 (b)		Renewal of certificate of approval after 31 December 2034
<i>Amend numbering as follows:</i>		
<b>9.3.3.52.1</b>		
9.3.1.52.3 (b)	<i>Delete</i>	
9.3.2.52.3 (b)		
9.3.3.52.3 (b)		
in conjunction with 3 (a)		
9.3.1.52.1 (e)	<i>Delete</i>	
9.3.3.52.1 (e)		
9.3.3.52.1 (b), (c), (d) and (e)	Electrical installations/echo sounding devices	N.R.M. for open Type N vessels Renewal of certificate of approval after 31 December 2034
<i>Amend numbering as follows:</i>		
9.3.3.52.2		<i>Unchanged</i>

<i>Paragraphs</i>	<i>Subject</i>	<i>Time limit and comments</i>
9.3.3.52.2 Modify numbering as follows: <b>9.3.3.52.10</b>	Accumulators located outside the cargo area  <i>Unchanged</i>	N.R.M. for open Type N vessels Renewal of certificate of approval after 31 December 2034  <i>Unchanged</i>
9.3.1.52.4 9.3.2.52.4 9.3.3.52.4 Last sentence <i>Amend numbering as follows:</i> <b>9.3.1.52.3</b> <b>9.3.2.52.3</b> <b>9.3.3.52.3</b> <b>Last sentence</b>	Disconnection of such installations from a centralized location  <i>Unchanged</i>	N.R.M. Renewal of certificate of approval after 31 December 2024
9.3.3.52.4 <i>Amend numbering as follows:</i> <b>9.3.3.52.3</b>	Electrical installations and equipment: marking in red	N.R.M. from 1 January 2019 for open Type N vessels Renewal of certificate of approval after 31 December 2034
9.3.3.52.5 <i>Amend numbering as follows:</i> <b>9.3.3.52.12</b>	Shutting down switch for continuously driven generator  <i>Unchanged</i>	N.R.M. for open Type N vessels Renewal of certificate of approval after 31 December 2034  <i>Unchanged</i>
9.3.3.52.6 <i>Amend numbering as follows:</i> <b>9.3.3.52.9</b>	Permanently fitted sockets  <i>Unchanged</i>	N.R.M. for open Type N vessels. Renewal of certificate of approval after 31 December 2034  <i>Unchanged</i>
9.3.1.56.1 9.3.3. 56.1 <i>Amend numbering as follows:</i> <b>9.3.1.53.2</b> <b>9.3.3.53.2</b>	Metallic sheaths for all cables in the cargo area	N.R.M. for vessels whose keels were laid before 1 January 1977. Renewal of certificate of approval after 31 December 2034  <i>Unchanged</i>
9.3.3.56.1 <i>Amend numbering as follows:</i> <b>9.3.3.53.2</b>	Metallic sheaths for all cables in the cargo area	N.R.M. at the latest by 1 January 2039 for oil-separator vessels  <i>Unchanged</i>

## Chapter 3.2, Table C

3.2.3.1, column (10) Replace twice (in the title and in the text) “of the high-velocity vent valve” by “of the pressure relief valve/high-velocity vent valve”.

3.2.3.1, column (16) Amend the text in brackets before the Note to read as follows:

“(flame arresters, vacuum relief valves, high velocity vent valves and devices for safe pressure relief of cargo tanks with integrated flame arrester plate stack).”.

3.2.3.1, column (17) Replace “a code referring to” by “information on”.

3.2.3.1, column (20) Amend the additional requirement or remark 5 to read as follows:

“5. This substance is liable to clog the venting piping and its fittings or the fittings of cargo tanks. Careful surveillance should be ensured.

If a closed-type tank vessel cargo tank is required for the carriage of this substance and explosion protection is necessary or the substance for which explosion protection is necessary is carried in a closed cargo tank, the cargo tank shall conform to 9.3.2.22.4 or 9.3.3.22.4 or the venting piping shall conform to 9.3.2.22.5 (a) or 9.3.2.22.5 (b) or to 9.3.3.22.5 (a) or 9.3.3.22.5 (b).

“This requirement does not apply when the cargo tanks and the corresponding piping are inerted in accordance with 7.2.4.18.”.

3.2.3.1, column (20) Amend additional requirement or remark 6 to read as follows:

“When external temperatures are below or equal to that indicated in column (20), the substance may only be carried in tank vessels equipped with a possibility of heating the cargo.

In addition, in the event of carriage in a closed cargo tank, the venting piping, the safety valves and the flame arresters shall be heatable.

The temperature of the venting piping, safety valves and flame arresters shall be kept at least above the melting point of the substance.”.

3.2.3.1, column (20) Amend additional requirement or remark 7 to read as follows:

“If a closed cargo tank is required to carry this substance or if the substance is carried in a closed cargo tank, the venting piping, the safety valves and the flame arresters shall be heatable.

The temperature of the venting piping, safety valves and flame arresters shall be kept at least above the melting point of the substance.”.

3.2.3.2, Table C Amend the heading of column (10) to read as follows: “Opening pressure of the pressure relief valve/high velocity vent valve, in kPa”.

3.2.3.2, Table C, Footnotes related to the list of substances

Replace “<sup>12)</sup> (Deleted)” by “<sup>12)</sup> This temperature class does not apply for the selection of explosion protected installations and equipment. The surface temperature of explosion protected installations and equipment shall not exceed 200 °C.”.

Insert footnote 12) for all entries with T1 and T2 in column (15).

3.2.3.3 Flowchart, Scheme A:

Replace “High-velocity vent valve opening pressure” by “Pressure relief valve/high velocity vent valve opening pressure” (four times).

3.2.3.3, Flowchart, Scheme B:

Replace “High-velocity vent valve opening pressure” by “Pressure relief valve/high velocity vent valve opening pressure” (three times).

3.2.3.3, column (17): in the heading, delete “for electrical equipment and systems”.

3.2.3.3, column (18): in the heading, replace “flammable gas detectors” by “gas detectors”.



3.2.4.3, A In columns (6), (7) and (8), replace “High-velocity vent valve opening pressure” by “Pressure relief valve/high velocity vent valve opening pressure” (11 times).

3.2.4.3 I. column (17): In the heading, delete “for electrical equipment and systems”.

3.2.4.3 J. column (18): In the heading, replace “flammable gas detectors” by “gas detectors”.

## Chapter 5

5.4.3 INSTRUCTIONS IN WRITING ACCORDING TO ADN — Action to take in the event of an accident or incident

Amend the second indent to read as follows:

“- Avoid sources of ignition, in particular, do not smoke, use electronic cigarettes or similar devices or switch on or off any electrical equipment or installation that does not meet the requirements for use in zone 1 (that means no installations or equipment marked in red according to 9.1.0.52.1, 9.3.1.52.2, 9.3.2.52.2 or 9.3.3.52.2) and is not designed for use in emergency response.”.

## Chapter 7.1

7.1.2.19.1 Amend the second paragraph to read as follows after the colon:

“1.16.1.1, 1.16.1.2, 1.16.1.3, 1.16.1.4, 7.1.2.5, 8.1.4, 8.1.5, 8.1.6.1, 8.1.6.3, 8.1.7, 8.3.5, 9.1.0.0, 9.1.0.12.3, 9.1.0.12.4, 9.1.0.17.2, 9.1.0.17.3, 9.1.0.31, 9.1.0.32.2, 9.1.0.34, 9.1.0.40.2, 9.1.0.41, 9.1.0.51, 9.1.0.52, 9.1.0.71 and 9.1.0.74.”.

7.1.3.41 Amend the heading to read as follows: “Smoking, fire or naked light”.

7.1.3.41.1 Amend to read as follows:

“Smoking, including electronic cigarettes and other similar devices, fire and naked light are prohibited on board the vessel.

This prohibition shall be displayed on notice boards at appropriate places.

The prohibition on smoking does not apply in the accommodation or the wheelhouse, provided that their windows, doors, skylights and hatches are closed or the ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa.”.

7.1.3.51 Amend the heading to read as follows: “Electrical and non-electrical installations and equipment”.

7.1.3.51.1 Replace “Electrical installations” by “Electrical and non-electrical installations and equipment”. [The other amendment does not apply to the English text.]

7.1.3.51.2 [Amendment to the German text does not apply to the French text. English text to be verified.]

7.1.3.51.4 Amend to read as follows:

“The electrical installations and equipment in the holds shall be kept switched off and protected against unauthorized unintentional connection.

This provision does not apply to permanently installed electrical cables passing through the holds, to movable electrical cables connecting containers stowed according to 7.1.4.4.4, or to electrical installations and equipment fulfilling the requirements for use in zone 1.”.

7.1.3.51 Insert the following new paragraphs:

“7.1.3.51.5 During a stay in the immediate vicinity of or within an onshore assigned zone, electrical and non-electrical installations and equipment not fulfilling the requirements of 9.1.0.52.1 or that may have a surface temperature higher than 200 °C (marked in red according to 9.1.0.51 and 9.1.0.52.2) shall be switched off and cooled down to below 200 °C, or the measures mentioned in 7.1.3.51.6 shall be taken.

7.1.3.51.6 7.1.3.51.5 does not apply in the accommodation, wheelhouse and service spaces if:

- (a) The ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa; and
- (b) The gas detection system is switched on, taking measurements continuously.

7.1.3.51.7 Installations and equipment referred to in 7.1.3.51.5 that have been switched off during a stay in the immediate vicinity of or within an onshore assigned zone may only be switched on again when the vessel is no longer in the vicinity of or within the onshore assigned zone or when a concentration of less than 10 % of the LEL of n-Hexane is reached in the wheelhouse, accommodation and service spaces.

The results of the measurements shall be recorded in writing.

7.1.3.51.8 If vessels are not able to meet the requirements of 7.1.3.51.5 and 7.1.3.51.6, they are not permitted to remain in the immediate vicinity of or within an onshore assigned zone.”.

7.1.4.4.4 In the introductory sentence:

- Replace “The electrical equipment fitted to the outside of a closed container may be connected” by “The electrical installations and equipment fitted to the outside of a closed container may be connected”.
- Replace “9.1.0.56” by “9.1.0.53.5”.
- Replace “and be put into operation provided that:” by “or be put into operation provided that:”

7.1.4.4.4 (a) Amend to read as follows:

“(a) These electrical installations and equipment are appropriate at least for use in zone 1 and comply with the requirements for temperature class T4 and explosion group II B; or that”.

7.1.4.4.4 (b) Amend the text before the indents as follows: “(b) Electrical installations and equipment that do not fulfil the requirements referred to in (a) are sufficiently separated from other containers containing substances of:”.

- In the sentence after the indents, replace “of 2.4 m around the electrical equipment” by “of 2.40 m around the electrical installations and equipment”.

7.1.4.4.4 The sentence before “Examples of stowage and segregation of containers” is modified to read as follows:

“The requirements of subparagraphs (a) and (b) need not be complied with if containers with the electrical installations or equipment which do not meet the requirements for use explosion danger areas and the containers containing the above-mentioned substances are stowed in separate holds.”.

7.1.4.4.5 Amend to read as follows:

“7.1.4.4.5 Electrical installations and equipment fitted on an open container may not be connected with removable electrical cables in accordance with the provisions of 9.1.0.53.5 or be used unless they are appropriate at least for use in zone 1 and they comply with the requirements for temperature class T4 and explosion group II B, or the container is loaded in a hold free of containers containing substances mentioned in 7.1.4.4.4 (b).”.

7.1.4.7.3 Add the following new paragraph:

“7.1.4.7.3 If a zone is assigned onshore at the loading or unloading station, the vessel is only authorized to stay in its immediate vicinity or within the zone if it meets the requirements of 9.1.0.12.3 (b) or (c), 9.1.0.51, 9.1.0.52.1 and 9.1.0.52.2.”.

7.1.4.53 Amend the final sentence to read as follows: “Where these lamps are positioned on deck in zone 2, they must conform to the requirements for use in zone 2.”.

7.1.4.75 Delete: “as well as appliances used in the protected area”.

7.1.6.16 In IN0, replace “flammable gas detector” by “gas detector”.

## Chapter 7.2

7.2.2.0 In NOTE 1, delete “or high velocity vent valves”.

7.2.2.6 Amend to read as follows:

### “Gas detection system

When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which n-Hexane is not representative, the gas detection system shall also be calibrated in addition according to the most critical LEL of the substances accepted for carriage on the vessel.”.

7.2.2.19.3 Amend the paragraph after the colon to read as follows:

“...: 1.16.1.1, 1.16.1.2, 1.16.1.3, 1.16.1.4, 7.2.2.5, 8.1.4, 8.1.5, 8.1.6.1, 8.1.6.3, 8.1.7, 8.3.5, 9.3.3.0.1, 9.3.3.0.3 (d), 9.3.3.0.5, 9.3.3.10.1, 9.3.3.10.2, 9.3.3.10.5, 9.3.3.12.4, 9.3.3.12.6, 9.3.3.16.1, 9.3.3.16.2, 9.3.3.17.1 bis, 9.3.3.17.4, 9.3.3.31.1 bis, 9.3.3.31.5, 9.3.3.32.2, 9.3.3.34.1, 9.3.3.34.2, 9.3.3.40.1, (however, a single fire or ballast pump is sufficient), 9.3.3.40.2, 9.3.3.41, 9.3.3.51, 9.3.3.52.1 to 9.3.3.52.8, 9.3.3.71 and 9.3.3.74.”.

7.2.2.19.3 Amend final paragraph to read as follows:

“Vessels used only to move tank vessels where the list of substances on the vessel according to 1.16.1.2.5 contains only substances for which explosion protection is not required do not have to meet the requirements of paragraphs 9.3.3.10.1, 9.3.3.10.5, 9.3.3.12.6, 9.3.3.51 and 9.3.3.52.1. In this case the following entry shall be made in the certificate of approval or provisional certificate of approval under number 5, permitted derogations: ‘Derogation from 9.3.3.10.1, 9.3.3.10.5, 9.3.3.12.6, 9.3.3.51 and 9.3.3.52.1; the vessel may only move tank vessels where the list of substances on the vessel according to 1.16.1.2.5 contains only substances for which explosion protection is not required’.”.

7.2.2.19.4 Add the following new paragraph:

“7.2.2.19.4 During loading and unloading of substances for which explosion protection is required in column (17) of Table C of 3.2, only installations and equipment that meet the requirements of 9.3.3.53 may be used on the deck of other vessels of the convoy. This condition shall not apply to:

(a) Installations and equipment of vessels linked fore or aft of the vessel which is being loaded or unloaded, if the tank vessel being loaded or unloaded is equipped with a protective wall at the respective end of the cargo area;

(b) Installations and equipment of tank vessels coupled side-by-side with the vessel being loaded or unloaded, if such installations or equipment are positioned behind a protective wall according to 9.3.3.10.3 and the protective wall is not next to the cargo area of the vessel being loaded or unloaded.”.

7.2.2.22 Delete and insert “(Deleted)”.

7.2.3.1.5 (a) Replace “flammable gas detector” by “gas detector”.

7.2.3.6 Amend to read as follows:

### “Gas detection system

The gas detection system shall be maintained and calibrated by qualified personnel in accordance with the instructions of the manufacturer.”

7.2.3.41 Amend the heading to read as follows: “Smoking, fire or naked light”.

7.2.3.41.1 Amend to read as follows:

“Smoking, including electronic cigarettes and other similar devices, fire and naked light are prohibited on board the vessel.

This prohibition shall be displayed on notice boards at appropriate places.

The prohibition on smoking does not apply in the accommodation or the wheelhouse, provided that their windows, doors, skylights and hatches are closed or the ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa.”.

7.2.3.51 Amend the heading to read as follows: “Electrical and non-electrical installations and equipment”.

7.2.3.51.1 Replace “Electrical installations” by “Electrical and non-electrical installations and equipment”. [The other amendment does not apply to the English text.]

7.2.3.51.2 In the first sentence, replace “in the cargo area” by “in the explosion danger areas”.

[Amendment to the German text does not apply to the French text. English text to be verified.]

7.2.3.51 Insert the following new paragraphs:

“7.2.3.51.4 During a stay in the immediate vicinity of or within an onshore assigned zone, electrical and non-electrical installations and equipment not complying with the requirements of 9.3.x.51 (a), 9.3.x.51 (b), 9.3.x.51 (c) or 9.3.x.52.1 (marked in red according to 9.3.x.51 and 9.3.x.52.3) shall be switched off, cooled down to below the temperature mentioned in 9.3.x.51 (a) or 9.3.x.51 (b), or the measures mentioned in 7.2.3.51.6 shall be taken.

When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of 3.2, this provision applies also during loading and unloading and gas-freeing during berthing.

7.2.3.51.5 When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which the temperature classes T4, T5 or T6 are indicated in column (15) of Table C of 3.2, the corresponding surface temperatures within the assigned zones shall not exceed 135 °C (T4), 100 °C (T5) or 85 °C (T6), respectively.

7.2.3.51.6 7.2.3.51.4 and 7.2.3.51.5 1 do not apply in the accommodation, the wheelhouse or service spaces if:

- (a) The ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa; and
- (b) The gas detection system is switched on, taking measurements continuously.

7.2.3.51.7 Installations and equipment according to 7.2.3.51.4 that have been switched off during loading and unloading, gas-freeing during berthing or a stay in the vicinity of or within an onshore assigned zone may only be switched on again after the vessel is no longer in the vicinity of or within the onshore assigned zone or when values corresponding to 10 % of the LEL of n-Hexane or 10 % of the LEL of the cargo, whichever is the more critical, are reached in the wheelhouse, accommodation and service spaces.

The results of the measurements shall be recorded in writing.

7.2.3.51.8 If vessels are not able to meet the requirements of 7.2.3.51.4 and 7.2.3.51.6, they are not permitted to remain in the immediate vicinity of or within an onshore assigned zone.”.

7.2.4.7.1 At the end, insert a new sentence to read as follows:

“If a zone is assigned onshore at the loading or unloading station, the vessel is only authorized to stay in its immediate vicinity or within the zone if it meets the requirements of 9.3.x.12.4 (b) or (c), 9.3.x.51, 9.3.x.52.1 and 9.3.x.52.3.”.

7.2.4.16.3 After “loading and unloading piping”, insert “where appropriate,”.

7.2.4.16.6 Replace “connection point” by “venting piping/vapour return piping connection point”.

- Replace “high velocity vent valve” by “pressure relief device/high-velocity vent valve”.

7.2.4.16.7 Amend to read as follows:

“When a tank vessel conforms to 9.3.2.22.4 (b) or 9.3.3.22.4 (b), the individual cargo tanks shall be closed off during transport and opened during loading, unloading and gas-freeing.”.

7.2.4.16.8 Amend the second sentence to read as follows: “Persons connecting or disconnecting the loading and unloading piping or the venting piping, relieving pressure in cargo tanks, taking samples, carrying out measurements or cleaning or replacing the flame arrester plate stack (see 7.2.4.22), shall wear the PP equipment referred to in 8.1.5 if this equipment is prescribed in column (18) of Table C in chapter 3.2; they shall also wear protective equipment A if a toximeter (TOX) is prescribed in column (18) of Table C of 3.2.”.

7.2.4.16.12 At the end of the first sentence, delete the full stop and insert “(explosion group/subgroup according to column (16) of table C of chapter 3.2).”.

7.2.4.17.1 Amend the first paragraph to read as follows:

“During loading, unloading, gas-freeing operations, or a stay in the vicinity of or within an onshore assigned zone, all entrances or openings of spaces which are accessible from the deck and all openings of spaces facing the outside shall remain closed.”.

7.2.4.17.1 In the penultimate indent of the second paragraph replace “9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3” by “9.3.1.12.4, 9.3.2.12.4 or 9.3.3.12.4”.

Amend the final indent of the second paragraph to read as follows:

“- air intakes of air conditioning installations if these openings are fitted with a gas detection system referred to in 9.3.1.12.4, 9.3.2.12.4 or 9.3.3.12.4.”.

7.2.4.22.1 At the end, add the following new paragraph:

“Pressure relief of cargo tanks is permitted only when using the device for safe pressure relief prescribed in 9.3.2.22.4 (a) and 9.3.2.22.4 (b) or 9.3.3.22.4 (a) and 9.3.3.22.4 (b). When explosion protection is required under column (17) of Table C of Chapter 3.2, the opening of cargo tank covers shall be permitted only if the cargo tanks in question have been gas-freed and the concentration of flammable gases in the tanks is less than 10 % of the lower explosive limit of the cargo/previous cargo. The results of the measurements shall be recorded in writing. Entry into these cargo tanks is not permitted for the purpose of measuring.”.

7.2.4.22.2 Amend to read as follows:

“Opening of sampling outlets is only permitted for sampling and control or cleaning of empty cargo tanks.”.

7.2.4.22.3 In the second sentence, delete: “and ullage openings”.

7.2.4.22.5 Amend to read as follows:

“Opening of the housing of the flame arresters is permitted only for the cleaning of the flame arrester plate stack or replacement by flame arrester plate stacks of the same design.

Opening is permitted only when the relevant cargo tanks are empty and the concentration of flammable gases in the cargo tank is less than 10 % of the lower explosive limit of the cargo/previous cargo.

The results of the measurements shall be recorded in writing.

Cleaning and replacing of the flame arrester plate stack shall be carried out only by trained and qualified personnel.”.

7.2.4.22.6 Amend to read as follows:

“For the operations referred to in 7.2.4.22.4 and 7.2.4.22.5, only low-sparking hand tools (e.g. chromium vanadium steel screwdrivers and wrenches) shall be used.”.

7.2.4.22.7 Amend to read as follows:

“The duration of opening shall be limited to the time necessary for control, cleaning, replacing the flame arrester or sampling.”.

7.2.4.22 Add the following new paragraph:

“7.2.4.22.8 The provisions of 7.2.4.22.1 to 7.2.4.22.7 above shall not apply to oil separator or supply vessels.”.

7.2.4.25 Amend to read as follows: “Loading and unloading piping and gas return piping”.

7.2.4.25.5 Amend to read as follows:

“The gas/air mixtures shall be returned ashore through a vapour return piping during loading operations when a closed type cargo tank is required in column (7) of Table C of Chapter 3.2.

For substances requiring explosion protection according to column (17) of Table C of Chapter 3.2, the connection of the vapour return piping shall be designed such that the vessel is protected against detonations and the passage of flames from the shore. The protection against detonations and the passage of flames from the shore shall at least correspond to the explosion group/subgroup according to column (16) of Table C of Chapter 3.2.

The protection of the vessel against detonations and the passage of flames from the shore is not required when the cargo tanks are inerted in accordance with 7.2.4.18.”.

7.2.4.25 Add the following new paragraph:

“7.2.4.25.7 For connecting or disconnecting loading or unloading piping and venting piping, only low-sparking hand tools (e.g. chromium vanadium steel screwdrivers and wrenches) shall be used.”.

7.2.4.28.2 Replace “high velocity vent valves” by “pressure relief devices/high-velocity vent valves”.

7.2.4.41 Amend the heading to read as follows: “Smoking, fire or naked light”.

At the end of the first sentence, add “and smoking is prohibited.”.

7.2.4.51 Amend the heading to read as follows: “Electrical installations and equipment”.

7.2.4.51.1 Delete and insert “(Deleted)”.

7.2.4.51.2 Delete and insert “(Deleted)”.

7.2.4.53 In the second sentence, replace “electric lamps” by “electrical lighting appliances” [The other amendments do not apply to the English text.].

Delete the final sentence: “Where these lamps are positioned in the cargo area, they shall be of the certified safe type.”.

7.2.4.74 Delete and insert “(Deleted)”.

## Chapter 8.1

8.1.2.1 (j) Amend to read as follows: “(j) The documents stipulated in subsection 8.1.3.1.”.

8.1.2.2 In the introductory sentence, replace “carried” by “available”.

8.1.2.2 (c) [Amendment to the German text does not apply to the French text. English text to be verified.]

8.1.2.2 At the end, add the following new subparagraphs:

“(e) A list of or a general plan indicating the fixed installations and equipment suitable for use at least in zone 1 and the installations and equipment complying with 9.1.0.51;

(f) A list of or a general plan indicating the fixed installations and equipment which are not authorized for use during loading and unloading, during a stay near to or within an onshore assigned zone (marked in red according to 9.1.0.52.2);

- (g) A plan indicating the boundaries of the zones and the location of the electrical and non-electrical equipment installed in the relevant zones intended for use in explosion danger areas;
- (h) A list of the installations and equipment referred to under (g) with the following information:
- Installation/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EC<sup>2</sup> or equivalent protection level, explosion group, temperature class, type of protection, test body) in case of electrical equipment for use in zone 1 (alternatively, a copy of the certificate of conformity according to Directive 2014/34/EC<sup>2</sup>);
  - Installation/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EC<sup>2</sup> or equivalent protection level, including explosion group and temperature class, type of protection, identification number) in case of electrical equipment for use in zone 2 and in the case of non-electrical equipment for use in zone 1 and zone 2 (alternatively, a copy of the certificate of conformity according to Directive 2014/34/EC<sup>2</sup>);

The documents listed above shall bear the stamp of the competent authority issuing the certificate of approval.”.

8.1.2.3 In the introductory sentence, replace “carried” by “available”.

8.1.2.3 (c) [Amendment to the German text does not apply to the French text. English text to be verified.]

8.1.2.3 (d) Delete and insert “(Deleted)”.

8.1.2.3 (f) Amend to read as follows:

“(f) The cargo pump-room inspection certificate according to 9.3.1.8.2, 9.3.2.8.2 or 9.3.3.8.2 and the certificate for the gas detection system and the oxygen measuring system prescribed in 9.3.1.8.3, 9.3.2.8.3 or 9.3.3.8.3;”.

8.1.2.3 (q) Amend to read as follows:

“(q) When transporting refrigerated liquefied gases and the temperature is not controlled in accordance with 9.3.1.24.1 (a) and 9.3.1.24.1 (c), the determination of the holding time (7.2.4.16.16, 7.2.4.16.17 and documentation on the heat transmission coefficient);”.

8.1.2.3 Add the following new sub-paragraphs:

“(r) A list of or a general plan indicating the fixed installations and equipment suitable to be used at least in zone 1 and the installations and equipment complying with 9.3.x.51;

(s) A list of or a general plan indicating the fixed installations and equipment which are not authorized for use during loading and unloading, gas-freeing or during a stay near to or within an onshore assigned zone (marked in red according to 9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3);

(t) A plan approved by a recognized classification society indicating the boundaries of the zones and the location of the electrical and non-electrical equipment installed in the relevant zone intended to be used in explosion danger areas, as well as self-contained protection systems;

(u) A list of the installations/equipment referred to under (t) and of the self-contained protection systems, with the following information:

<sup>2</sup> *Journal of the European Communities, No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities, No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities No. L 23 of 26 February 2014, S. 309.*

- Installations/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EC<sup>2</sup> or at least equivalent), including explosion group and temperature class, type of protection and test body, in the case of electrical equipment for use in zone 0 or zone 1 and, in the case of non-electrical equipment for use in zone 0; (alternatively, a copy of the inspection certificate, for example the declaration of conformity under Directive 2014/34/EC<sup>2</sup>);
  - Installation/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EC<sup>2</sup> or equivalent protection level, including explosion group and temperature class, type of protection, identification number) in the case of electrical equipment for use in zone 2 and in the case of non-electrical equipment for use in zone 1 and zone 2 (alternatively, a copy of the inspection certificate, for example, the certificate of conformity according to Directive 2014/34/EC<sup>2</sup>);
  - Self-protection system, place of installation, marking (explosion group/subgroup):
- (v) A list of or general plan indicating the fixed installations and equipment installed outside the explosion danger areas that may be used during loading, unloading, gas-freeing, berthing or during a stay in the immediate vicinity of or within an onshore assigned zone, if not referred to in (r) and (u).

The documents listed in (r) to (v) shall bear the stamp of the competent authority issuing the certificate of approval.”

8.1.5.1 Replace “EX: a flammable gas detector” by “EX: a gas detector”.

8.1.5.2 Amend to read as follows:

“For operations carried out in explosion danger areas or during stay in the vicinity of or within a shoreside assigned zone only low-sparking hand-tools (e.g. chromium vanadium steel screwdrivers and wrenches) shall be used.”

8.1.6.3 In the first sentence, replace “and the gas detection system” by “and the gas detection system and oxygen measuring system”. In the second sentence replace “certificate” by “the last certificate”.

8.1.6.5 Delete and insert “(Deleted)”.

8.1.7 Amend to read as follows: “installations, equipment and self-contained protection systems”. Delete the text after the heading.

8.1.7 Add the following new paragraph:

“8.1.7.1 **Electrical installations and equipment**

The insulation resistance of the fixed electrical installations and equipment and their earthing shall be inspected whenever the certificate of approval is renewed and, in addition, within the third year from the date of issue of the certificate of approval by a person authorized for this purpose by the competent authority.

A certificate concerning this inspection shall be carried on board.”

8.1.7 Add the following new paragraph:

“8.1.7.2 **Installations and equipment intended for use in explosion danger areas, “limited explosion risk” type equipment, installations and equipment complying with 9.3.1.51, 9.3.2.51 and 9.3.3.51 and autonomous protective systems.**

Such installations, equipment and autonomous protective systems and their compliance with the documents referred to in 8.1.2.2 (e) to (h) or 8.1.2.3 (r) to (v) in respect of the situation on board shall be inspected whenever the certificate of approval is renewed and, in addition,

<sup>2</sup> *Journal of the European Communities, No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities, No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities, No. L 23 of 26 February 2014, S. 309.*

<sup>2</sup> *Journal of the European Communities, No. L 23 of 26 February 2014, S. 309.*



within the third year from the date of issue of the certificate of approval, by a person authorized for this purpose by the classification society that classified the vessel or by the competent authority. A certificate concerning this inspection shall be carried on board.

The marking on the installations and equipment intended for use in explosion danger areas showing that they are appropriate for use in explosion danger areas and marking on self-contained protection systems with their conditions of use should remain in place throughout the period of use on board.

The manufacturer's instruction on flame arresters or pressure relief devices may require a more regular frequency of inspection."

8.1.7 Add the following new paragraph:

**8.1.7.3 Repair of explosion-protected installations and equipment and autonomous protection systems**

Repair of explosion-protected installations and equipment and autonomous protection systems is permitted only by a competent person. Following repairs, a certificate must be issued attesting to their reusability in explosion danger areas. The certificate must be available on board."

8.2.2.3.1.1 Amend the indent on measurement techniques to read as follows:

- Measurements of toxicity, oxygen content and the concentration of flammable gases."

In the indent on practical exercises, replace "flammable gas detectors" by "gas detectors".

Add at the end of 8.2.2.3.1.1:

"Basics of explosion protection:

- According to the definition of 'explosion protection';
- Selection of appropriate devices and installations."

8.2.2.3.1.3 Amend the first indent on measurement techniques to read as follows:

- Measurements of toxicity, oxygen content and the concentration of flammable gases."

Add at the end of 8.2.2.3.1.3:

"Basics of explosion protection:

- According to the definition of 'explosion protection';
- Selection of appropriate devices and installations."

8.3.2 Amend to read as follows:

**"Portable lighting apparatus**

On board, only portable lighting appliances with their own source of power are permitted in explosion danger areas and on deck.

In explosion danger areas, they shall meet at least the requirements for use in the relevant area."

8.3.4 Amend to read as follows:

**"Prohibition on smoking, fire and naked light**

Smoking, including of electronic cigarettes and similar devices, fire and naked light are prohibited on board. However, the provisions of 7.2.3.42.3 and 7.2.3.42.4 are applicable.

This prohibition shall be displayed on notice boards at appropriate places.

The prohibition on smoking does not apply in the accommodation or the wheelhouse, provided that their windows, doors, skylights and hatches are closed or the ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa."



<sup>3</sup> For “x”, note the relevant information”.

8.6.1.3 and 8.6.1.4 Amend point 9 of the model to read as follows:

“9. Electrical and non-electrical installations and equipment for use in explosion danger areas:

- Temperature class .....
- Explosion group .....”.

8.6.1.3 and 8.6.1.4 Add the following new point 10:

“10. Autonomous protection systems:

Explosion group/subgroup of explosion group II B: .....”.

Adjust the subsequent numbering in the models (former point 10 becomes point 11, former point 11 becomes point 12, etc.)

8.6.1.3 and 8.6.1.4 Amend new point 13 (former point 12) to read as follows:

“13. Additional observations:

Vessel complies with the rules of construction referred to in 9.3.x.12, 9.3.x.51, 9.3.x.52  
yes/no<sup>1</sup>

.....  
.....  
.....”.

8.6.1.3 and 8.6.1.4, page 3 of the models

- Line 8: Replace “high velocity vent valve” by “pressure relief device/high velocity vent valve”.
- Delete line 17 (“venting piping according to 9.3.2.22.5 or 9.3.3.22.5”).

8.6.3, question 12.2 Replace “of the high velocity vent valves” by “of the pressure relief devices/high velocity vent valves”.

8.6.3, question 12.3 At the end of the question, add: “(explosion group/subgroup) according to column (16) of Table C of Chapter 3.2)?”.

8.6.3, question 18 Amend to read as follows:

“To be filled in only in the case of loading or unloading of substances for the carriage of which a closed cargo tank or an open cargo tank with flame arrester is required:

Are the cargo tank hatches and cargo tank inspection and sampling openings closed or protected by flame arresters fulfilling the requirements of column (16) of Table C in 3.2)?”.

## Chapter 9.1

9.1.0.12.1 Delete the second sentence: “The ventilator fan shall be designed so that no sparks may be emitted on contact of the impeller blades with the housing and no static electricity may be generated.”.

9.1.0.12.3 Amend to read as follows:

“(a) Ventilation shall be provided for the accommodation, wheelhouse and for service spaces;

(b) The ventilation system in such spaces shall meet the following requirements:

- (i) The air intakes of the ventilation system shall be located as far away as possible, and not less than 6.00 m from the protected area and not less than 2.00 m above the deck;
- (ii) Pressure of at least 0.1 kPa (0.001 bar) may be maintained in the premises;

- (iii) A breakdown alarm is integrated;
  - (iv) The ventilation system, including the breakdown alarm, shall be at least of the 'limited explosion risk' type;
  - (v) A gas detection system conforming to conditions 1. to 4. below is connected to the ventilation system:
    - 1. It is appropriate at least for use in zone 1, explosion group IIC and temperature class T6;
    - 2. It is equipped with sensors:
      - On the suction inlets of the ventilation systems; and
      - Directly below the top edge of the sill of the entrance doors;
    - 3. Its t90-time is lower than or equal to 4 s;
    - 4. Measurement shall be continuous;
  - (vi) In the service spaces, the ventilation system is linked to the emergency lighting, which shall be at least of the 'limited explosion risk' type;  
This emergency lighting is not necessary if the lighting installations in the service spaces are of at least the 'limited explosion risk' type;
  - (vii) The suction of the ventilation system and installations and equipment that do not meet the requirements of 9.1.0.51 and 9.1.0.52.1 shall be shut down when a concentration equal to 20 % of the LEL of n-Hexane is reached;  
The switching-off shall be indicated in the accommodation and wheelhouse by visual and audible signals;
  - (viii) In the event of failure of the ventilation system or of the gas detection installations in the accommodation, installations and equipment in the accommodation that do not comply with the requirements of 9.1.0.51 and 9.1.0.52.1 shall be switched off;  
The switching-off shall be indicated in the accommodation, the wheelhouse and on the deck by visual and audible signals;
  - (ix) In the event of failure of the ventilation system or of the gas detection installations in the wheelhouse or the service spaces, installations and equipment in those spaces that do not comply with the requirements of 9.1.0.51 and 9.1.0.52.1 shall be switched off;  
The switching-off shall be indicated in the wheelhouse and on the deck by visual and audible signals. The alarm must be relayed to the accommodation automatically if it has not been switched off;
  - (x) Any switching-off shall take place immediately and automatically and, if necessary, shall switch on the emergency lighting;  
The automatic switch-off device is set so that no automatic switching-off may occur while the vessel is under way;
- (c) If the ventilation system of a space does not comply with all the requirements set out in (b) above, any installations or equipment present in that space that may, if switched on, give rise to surface temperatures higher than those mentioned in 9.1.0.51 or that do not meet the requirements set out in 9.1.0.52.1 must be capable of being switched off.”.

9.1.0.12 Insert the following new paragraphs:

“9.1.0.12.4 Notice boards shall be fitted at the ventilation inlets indicating the conditions under which they shall be closed. All ventilation inlets of accommodation, wheelhouse and service spaces leading into the open air outside of the protected area shall be located not less than 2.00 m from the protected area.

All ventilation inlets shall be fitted with fixed devices according to 9.1.0.40.2.2 (c) enabling them to be closed rapidly. It shall be clear whether they are open or closed.

9.1.0.12.5 Ventilators including their motors used within the protected area and motors for hold ventilators which are arranged in the air flow shall fulfil at least the requirements for use in zone 1. They shall meet at least the requirements for temperature class T4 and explosion group II B.

9.1.0.12.6 The requirements of 9.1.0.12.3 (b) or (c) must be met only if the vessel is located within or in the immediate vicinity of a shoreside assigned zone.”.

Replace “9.1.0.42-9.1.0.51 (reserved)” by “9.1.0.42-9.1.0.50 (reserved)”.

9.1.0.51 Add the following new paragraph:

**“9.1.0.51 Surface temperatures of electrical and non-electrical installations and equipment**

- (a) The surface temperatures of electrical and non-electrical installations and equipment as well as the outer parts of engines and their inlets and exhaust ducts shall not exceed 200 °C;
- (b) The following are exempt from the above provision:
  - Accommodation, wheelhouse and service spaces where surface temperatures higher than 200 °C occur that are equipped with a ventilation system according to 9.1.0.12.3; or
  - Installations and equipment which generate surface temperatures higher than 200 °C and that can be switched off. Such installations and equipment shall be marked in red;
- (c) Within the protected area, 9.1.0.53.1 applies;
- (d) The requirements of 9.1.0.51 (a) and (b) must be met only if the vessel is located within or in the immediate vicinity of a shoreside assigned zone.”.

9.1.0.52 Amend to read as follows: “Type and location of electrical installations and equipment”.

9.1.0.52.1 Amend to read as follows:

“Electrical installations and equipment outside the protected area shall be at least of the “limited explosion risk” type. This provision does not apply to:

- (a) Lighting installations in the accommodation and in the wheelhouse, except for switches located near to the entrances;
- (b) Mobile and fixed telephone installations in the accommodation or the wheelhouse;
- (c) Electrical installations and equipment which, during a stay in the immediate vicinity of or within a shoreside assigned zone, are:
  - Not live; or
  - Installed in spaces which are equipped with a ventilation system according to 9.1.0.12.3;
- (d) Radiotelephone installations and inland AIS (automatic identification systems) stations in the accommodation and in the wheelhouse if no part of an aerial for radiotelephone installations or AIS stations is situated above or within 2 m from the protected area.”.

9.1.0.52.2 Amend to read as follows:

“9.1.0.52.2 Fixed electrical installations and equipment which do not meet the requirements set out in 9.1.0.52.1 and their switches shall be marked in red. The disconnection of such equipment shall be controlled from a centralized location on board.”.

9.1.0.52 Insert the following new paragraphs:

“9.1.0.52.5 Failure of the power supply for the safety and control equipment shall be immediately indicated by visual and audible signals in the wheelhouse and on the deck. The alarm must be relayed to the accommodation automatically if it has not been switched off.

9.1.0.52.6 Electrical switches, sockets and cables on deck shall be protected against mechanical damage.

9.1.0.52.7 Sockets for the connection of signal lights and gangway lighting shall be solidly fitted to the vessel close to the signal mast or the gangway. Sockets intended to supply the submerged pumps, hold ventilators and containers shall be permanently fitted to the vessel in the vicinity of the hatches.

9.1.0.52.8 The requirements of 9.1.0.52.1 and 9.1.0.52.2 must be met only if the vessel is located within or in the immediate vicinity of a shoreside assigned zone.”.

9.1.0.53 Insert the following new paragraphs:

**“9.1.0.53 Type and location of electrical and non-electrical installations and equipment intended for use in the protected area**

9.1.0.53.1 It shall be possible to isolate the electrical installations and equipment in the protected area by means of centrally located switches except where:

- In the holds, they are appropriate at least for use in zone 1, for temperature class T4 and explosion group II B; and
- In the protected area on the deck, they are of the limited explosion risk type.”.

The corresponding electrical circuits shall have control lamps to indicate whether or not the circuits are live.

The switches shall be protected against unintended unauthorized operation. Submerged pumps installed or used in the holds shall be appropriate at least for use in zone 1, temperature class T4 and explosion group II B.

9.1.0.53.2 The sockets used in the protected area shall be designed so as to prevent connection or disconnection except when they are not live.

9.1.0.53.3 Except in the case of optical fibres, electrical cables within the protected area shall be armoured or placed in a metallic sheath or in protective tubes.

9.1.0.53.4 Movable electrical cables are prohibited in the protected area, except for intrinsically safe electric circuits or for the supply of signal lights and lighting for gangways, containers, submerged pumps, hold ventilators and electrically operated cover gantries.

9.1.0.53.5 For movable electrical cables permitted in accordance with 9.1.0.53.4 above, only rubber-sheathed electrical cables of type H07 RN-F in accordance with IEC-60245-4:2001 or electrical cables of at least equivalent design having conductors with a cross-section of not less than 1.5 mm<sup>2</sup>, shall be used. These cables shall be as short as possible and installed so that damage is not likely to occur.

9.1.0.53.6 Non-electrical installations and equipment in the protected area which are intended for use during loading and unloading or stay in the immediate vicinity of or within a shoreside assigned zone shall meet at least the requirements for use in the area concerned. They shall meet at least the requirements for temperature class T4 and explosion group II B.”.

Replace “9.1.0.53-9.1.0.55 (reserved)” by “9.1.0.54-9.1.0.55 (reserved)”.

9.1.0.56 Delete and insert “(Deleted)”.

9.1.0.56.1 *Delete*

9.1.0.56.2 *Delete*

9.1.0.56.3 *Delete*

## Chapter 9.3

9.3.x.8.2 Amend paragraph 2 to read as follows:

“The inspection shall include at least an inspection of the whole system for its condition, for corrosion, leakage or unauthorized changes.”.

9.3.x.8.3 Amend to read as follows:

“The proper functioning of the gas detection system referred to in 9.3.x.12.4 and 9.3.x.17.6 and of the oxygen measuring system according to 9.3.x.17.6 shall be checked by a recognized classification society or by a person authorized for this purpose by the competent authority whenever the certificate of approval has to be renewed and during the third year of validity of the certificate of approval. A signed certificate must be available on board.”.

9.3.3.8.4 The current text of 9.3.3.8.4 becomes 9.3.3.8.5.

9.3.x.8.4 Add the following new paragraph:

“The conformity of the documents required in 8.1.2.3 (r) to (v) with the circumstances on board shall be inspected by a recognized classification society, an inspection body or by a person authorized for that purpose by the competent authority whenever the certificate of approval is renewed and, in addition, once during the third year of validity of the certificate of approval. A signed certificate must be available on board.”.

9.3.x.10 Amend to read as follows: “Protection against the penetration of dangerous gases and the spreading of dangerous liquids”.

9.3.x.10.1 Amend to read as follows:

“The vessel shall be designed so as to prevent dangerous gases and liquids from penetrating into the accommodation, wheelhouse and service spaces. None of the windows in these spaces shall be capable of being opened unless its intended use is as an emergency exit and it is marked as such.”.

9.3.x.10.2 Amend to read as follows:

“Liquid-tight protective coamings shall be fitted on deck at the height of the external bulkheads of the cargo tanks, at a maximum distance of 0.60 m from the outer cofferdam bulkhead or the hold end bulkheads. The protective coamings shall either extend over the entire width of the vessel or be fixed between the longitudinal spill coamings so as to prevent liquids from entering the forepeak and afterpeak. The height of the protective coamings and the spill coamings shall be at least 0.075 m. The protective coaming may correspond to the protection wall prescribed in 9.3.x.10.3 if the protection wall extends across the entire width of the vessel.”.

9.3.1.10.3 Amend to read as follows:

“9.3.1.10.3 When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of table C of chapter 3.2, the use of installations and equipment that are not of at least the ‘limited explosion risk’ type is not permitted during loading and unloading operations in parts of the deck outside the cargo area, unless those parts are protected against the entry of gases and liquids by a gas- and liquid-tight protection wall. The wall must either extend from one side of the vessel to the other or surround the areas to protect in an U-shaped form. The wall must cover the whole width of the area to protect and at least 1.00 m in the direction opposite to the cargo area (see Classification of zones diagram). The height of the wall shall be at least 1.00 m above the adjacent cargo deck area in the cargo area. The outer wall and side walls of the accommodation can be considered as a protection wall if they do not include openings and if the dimensions are complied with.

A protection wall is not required where the distance between the areas to be protected and the safety valve, the shore connections of the piping for loading and unloading, the compressor on deck and the opening of the closest pressure tanks is at least 12.00 m.”.

9.3.2.10.3 and 9.3.3.10.3 Amend to read as follows:

“When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of table C of chapter 3.2, the use of installations and equipment that are not of at least the ‘limited explosion risk’ type is not permitted during loading and unloading operations in parts of the deck outside the cargo area, unless those parts are protected against the penetration of gases and liquids by a gas- and liquid-tight protection wall. The wall must either extend over the full width of the vessel or surround the areas to be protected in an U-shaped form. The wall must cover the whole width of the area to be protected and at least 1.00 m in the direction opposite to the cargo area (see Classification of zones diagram). The height of the wall shall be at least 1.00 m above the adjacent cargo deck area in the cargo area. The outer wall and side walls of the accommodation can be considered as a protection wall if they do not include openings and if the dimensions are complied with.

A protection wall is not required where the distance between the areas to be protected and the high velocity vent valve, the shore connections of the piping for loading and unloading, the compressor on deck and the opening of the closest pressure tanks is at least 12.00 m.”.

9.3.x.10.4 Amend to read as follows:

“On deck, the lower edges of door-openings in the sidewalls of superstructures and the sills of hatches and ventilation openings of premises located under the deck shall have a height of not less than 0.50 m above the deck.

This requirement does not apply to access openings to double-hull spaces and double bottoms.”.

9.3.1.10.5 and 9.3.2.10.5 Add the following new paragraph:

“9.3.x.10.5 The bulwarks, foot-rails, etc., shall be provided with sufficiently large openings which are located directly above the deck.”.

9.3.3.10.5 Amend to read as follows:

“9.3.3.10.5 The bulwarks, foot-rails, etc. shall be provided with sufficiently large openings which are located directly above the deck.”.

9.3.3.10 Add the following new paragraph:

“9.3.3.10.6 Open Type N vessels are only required to meet the requirements of 9.3.3.10.1 if the vessel remains in the immediate vicinity of or within a shoreside assigned zone.”.

9.3.2.11.2 (a) Delete the final sentence: “Refrigerated cargo tank fastenings shall meet the requirements of a recognised classification society.”.

9.3.2.11.2 (b) At the end, add the following sentence: “Refrigerated cargo tank fastenings shall meet the requirements of a recognised classification society.”.

9.3.2.11.2 (e) Amend to read as follows:

“(e) A local recess in the cargo deck, contained on all sides, with a depth greater than 0.10 m, designed to house the cargo pump, is permitted if it fulfils the following conditions:

- The recess shall not be greater than 1.00 m in depth.
- The recess shall be located not less than 6.00 m from entrances and openings to accommodation and service spaces outside the cargo area.
- The recess shall be located at a minimum distance from the side plating equal to one quarter of the vessel’s breadth;
- All pipes linking the recess to the cargo tanks shall be fitted with shut-off devices fitted directly on the bulkhead;
- All the controls required for the equipment located in the recess shall be activated from the deck;
- It shall be possible to drain the recess using a system installed on deck in the cargo area and independent of any other system;



- The recess shall be provided with a level alarm device which activates the draining system and triggers a visual and audible alarm in the wheelhouse and on the deck when liquid accumulates at the bottom;
- When the recess is located above the cofferdam, the engine room bulkhead shall have an ‘A-60’ fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3;
- When the cargo area is fitted with a water-spray system, electrical equipment located in the recess shall be protected against infiltration of water;
- Pipes connecting the recess to the hull shall not pass through the cargo tanks.”.

9.3.2.11.2 Add the following new paragraph (f) at the end:

- “(f) When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of 3.2.3.2 and the recess is deeper than 0.50 m, it shall be provided with a permanent gas detection system which automatically indicates the presence of explosive gases by means of direct-measuring sensors and actuates a visual and audible alarm when the gas concentration has reached 20 % of the lower explosion limit (LEL) of the cargo or 20 % of the LEL of n-Hexane, whichever is the more critical value. The sensors of this system shall be placed at suitable positions at the bottom of the recess.

Measurement shall be continuous;

Visual and audible alarms shall be installed in the wheelhouse and on deck and, when the alarm is actuated, the vessel loading and unloading system shall be shut down. Failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by means of visual and audible alarms.”.

9.3.1.12.3 and 9.3.2.12.3 Amend to read as follows:

- “(a) A service space located within the cargo area below deck shall be provided with a ventilation system. The capacity of the fans shall be sufficient to ensure 20 complete changes of air per hour based on the volume of the service space.

The ventilation exhaust ducts shall extend down to 50 mm above the bottom of the service space. The air shall be supplied through a duct at the top of the service space.

- (b) When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the air inlets shall be located not less than 2.00 m above the deck, at a distance of not less than 2.00 m from tank openings and 6.00 m from the outlets of safety valves.

The extension pipes which may be necessary may be of the hinged type.”.

9.3.3.12.3 Amend to read as follows:

- “(a) A service space located within the cargo area below deck shall be provided with a ventilation system. The capacity of the fans shall be sufficient to ensure 20 complete changes of air per hour based on the volume of the service space.

The ventilation exhaust ducts shall extend down to 50 mm above the bottom of the service space. The air shall be supplied through a duct at the top of the service space.

- (b) When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the air inlets shall be located not less than 2.00 m above the deck, at a distance of not less than 2.00 m from tank openings and 6.00 m from the outlets of safety valves.

The extension pipes which may be necessary may be of the hinged type.

- (c) On board open Type N vessels, other suitable installations without ventilator fans shall be sufficient.”.

9.3.x.12.4 Amend to read as follows:

- “(a) Ventilation shall be provided for the accommodation, wheelhouse and service spaces.
- (b) The ventilation system in such spaces shall meet the following requirements:
- (i) The air intakes shall be located as far away as possible, and not less than 6.00 m from the protected area and not less than 2.00 m above the deck;
  - (ii) Pressure of at least 0.1 kPa (0.001 bar) may be maintained in the premises;
  - (iii) A breakdown alarm is integrated;
  - (iv) The ventilation system, including the breakdown alarm, shall be at least of the ‘limited explosion risk’ type;
  - (v) A gas detection system conforming to conditions 1. to 4. below is connected to the ventilation system:
    - 1. It is appropriate at least for use in zone 1, explosion group IIC and temperature class T6;
    - 2. It is equipped with sensors
      - On the suction inlets of the ventilation systems; and
      - Directly below the top edge of the sill of the entrance doors;
    - 3. Its t90 response time is lower than or equal to 4 s;
    - 4. Measurement shall be continuous;
  - (vi) In the service spaces, the ventilation system is linked to the emergency lighting, which shall be at least of the ‘limited explosion risk’ type;  
This emergency lighting is not necessary if the lighting installations in the service spaces are of at least the ‘limited explosion risk’ type;
  - (vii) The suction of the ventilation system and installations and equipment that do not meet the requirements set out in 9.3.x.51 (a) and (b) and 9.3.x.52.1 must be shut down when a concentration of 20 % of LEL of n-Hexane is reached;  
The switching-off shall be indicated in the accommodation and wheelhouse by visual and audible signals;
  - (viii) In the event of failure of the ventilation system or the gas detection installations in the accommodation, installations and equipment in the accommodation that do not meet the requirements set out in 9.3.x.51 (a) and (b) and 9.3.x.52.1 must be stopped;  
The failure shall be indicated in the accommodation, the wheelhouse and on the deck by visual and audible signals;
  - (ix) In the event of failure of the ventilation system or the gas detection installations in the wheelhouse or service spaces, installations and equipment in those spaces that do not meet the requirements set out in 9.3.x.51 (a) and (b) and 9.3.x.52.1 must be shut down;  
The failure shall be indicated in the wheelhouse and on the deck by visual and audible signals. The alarm must be relayed to the accommodation automatically if it has not been switched off;
  - (x) Any switching-off shall take place immediately and automatically and, if necessary, shall activate the emergency lighting;  
The automatic switch-off device is set so that no automatic switching-off may occur while the vessel is under way;
- (c) If the ventilation system of a space does not comply with all the requirements set out in (b) above, any installations or equipment present in that space that may, if switched on, give rise to surface temperatures higher than those mentioned in 9.3.x.51 (a) and (b) or that do not meet the requirements set out in 9.3.x.52.1 must be capable of being switched off.”

9.3.1.12.5, 9.3.2.12.5 and 9.3.3.12.5 Delete and insert “(Deleted)”.

9.3.x.12.6 Amend to read as follows:

“Notice boards shall be fitted at the ventilation inlets indicating the conditions under which they shall be closed. All ventilation inlets of accommodation, wheelhouse and service spaces leading to the open air outside the cargo area shall be fitted with devices permanently fixed according to 9.3.x.40.2.2 (c), enabling them to be closed rapidly. It shall be clear whether they are open or closed.

Such ventilation inlets shall be located not less than 2.00 m from the cargo area.

Ventilation inlets of service spaces in the cargo area may be located within that area.”.

9.3.2.12.7 Delete and insert “(Deleted)”.

9.3.3.12.7 Amend to read as follows:

“9.3.3.12.7 Open Type N vessels are only required to meet the requirements of 9.3.3.12.4 (b) or (c) if the vessel remains in the immediate vicinity of or within a shoreside assigned zone.”.

9.3.3.12.8 Delete: “9.3.3.12.5,”

9.3.1.17.1, 9.3.2.17.1 and 9.3.3.17.1 Amend the first sentence to read as follows:

“Accommodation spaces and the wheelhouse shall be located outside the cargo area forward of the fore vertical plane or abaft the aft vertical plane bounding the part of the cargo area below deck.”.

9.3.1.17.6 Amend to read as follows:

“A service space located within the cargo area below deck shall not be used as a cargo pump room for the vessel’s own gas discharging system, e.g. compressors or the compressor/heat exchanger/pump combination, except where:

- The cargo pump-room is separated from the engine room or from service spaces outside the cargo area by a cofferdam or a bulkhead with ‘A-60’ fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, or by a service space or a hold space;
- The ‘A-60’ bulkhead required above does not include penetrations referred to in 9.3.1.17.5 (a);
- Ventilation exhaust outlets are located not less than 6.00 m from entrances and openings of the accommodation, wheelhouse and service spaces outside the cargo area;
- The access hatches and ventilation inlets can be closed from the outside;
- All piping for loading and unloading (at the suction side and the delivery side) are led through the deck above the pump-room. The necessary operation of the control devices in the pump-room, starting of pumps or compressors and control of the liquid flow rate shall be effected from the deck;
- The system is fully integrated in the gas and liquid piping system;
- The cargo pump room is provided with a permanent oxygen detection system which automatically indicates the amount of oxygen and which actuates a visual and audible alarm when the oxygen concentration has reached 19.5 % by volume. The sensors of this system shall be placed at suitable positions at the bottom and at a height of 2 m. Measurement shall be continuous and displayed near to the entrance. Audible and visual alarms shall be installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system shall be shut down;
- Failure of the oxygen measuring system shall actuate a visual and audible alarm in the wheelhouse and on deck. The alarm must be relayed to the accommodation automatically if it has not been switched off;
- The ventilation system prescribed in 9.3.2.12.3 has a capacity sufficient to ensure not less than 30 changes of air per hour based on the total volume of the service space.

When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the cargo pump room shall also be provided with a permanent gas detection system which automatically indicates the presence of explosive gases by means of direct-measuring sensors and actuates a visual and audible alarm when the gas concentration has reached 20 % of the LEL of the cargo or 20 % of the LEL of n-Hexane, whichever gives the more critical value.

The sensors of this gas detection system shall be placed at suitable positions at the bottom and directly below the deck.

Measurement shall be continuous and displayed near to the entrance.

Audible and visual alarms shall be installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system shall be shut down.

Any failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by a visual and audible warning. The alarm must be relayed to the accommodation automatically if it has not been switched off.”

9.3.2.17.6 and 9.3.3.17.6 Amend to read as follows:

“A service space located within the cargo area below deck shall not be used as a cargo pump-room for the loading and unloading system, except where:

- The cargo pump-room is separated from the engine room or from service spaces outside the cargo area by a cofferdam or a bulkhead with ‘A-60’ fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, or by a service space or a hold space;
- The ‘A-60’ bulkhead required above does not include penetrations referred to in 9.3.x.17.5 (a);
- Ventilation exhaust outlets are located not less than 6.00 m from entrances and openings of the accommodation, wheelhouse and service spaces outside the cargo area;
- The access hatches and ventilation inlets can be closed from the outside;
- All piping for loading and unloading as well as that of stripping systems is provided with shut-off devices at the pump suction side in the cargo pump-room immediately at the bulkhead. The necessary operation of the control devices in the pump-room, starting of pumps and control of the liquid flow rate shall be effected from the deck;
- The bilge of the cargo pump-room is equipped with a gauging device for measuring the filling level which activates a visual and audible alarm in the wheelhouse when liquid is accumulating in the cargo pump-room bilge;
- The cargo pump room is provided with a permanent oxygen detection system which automatically indicates the amount of oxygen and which actuates a visual and audible alarm when the oxygen concentration has reached 19.5 % by volume. The sensors of this system shall be placed at suitable positions at the bottom and at a height of 2 m. Measurement shall be continuous and displayed near to the entrance. Audible and visual alarms shall be installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system shall be shut down;

Failure of the oxygen measuring system shall activate a visual and audible alarm in the wheelhouse and on deck. The alarm must be relayed to the accommodation automatically if it has not been switched off;

- The ventilation system prescribed in 9.3.x.12.3 has a capacity sufficient to ensure not less than 30 changes of air per hour based on the total volume of the service space.

When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the cargo pump room shall also be provided with a permanent gas detection system which automatically indicates the presence of explosive gases by means of direct-measuring sensors and actuates a visual and audible alarm when the gas concentration has reached 20 % of the LEL of the cargo or 20 % of the LEL of n-Hexane, whichever gives the more critical value.

The sensors of this gas detection system shall be placed at suitable positions at the bottom and directly below the deck. Measurement shall be continuous and displayed near to the entrance.

Audible and visual alarms shall be installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system shall be shut down.

Any failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by a visual and audible warning. The alarm must be relayed to the accommodation automatically if it has not been switched off.”

9.3.3.17.8 After “9.3.3.17.6”, insert “except for the permanent oxygen measuring system”.

9.3.2.20.4 and 9.3.3.20.4 Amend to read as follows:

“When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the ventilation openings of cofferdams shall be fitted with a flame arrester capable of withstanding a deflagration. The flame arresters shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2).”

9.3.3.20.5 Amend to read as follows:

“9.3.3.20.5 9.3.3.20.2 above does not apply to oil separator and supply vessels.”

9.3.2.21.1 (f) and 9.3.2.21.1 (f) Amend to read as follows:

“(f) An instrument for measuring the temperature of the cargo, if in column (9) of Table C of Chapter 3.2, a cargo heating installation or a possibility of heating the cargo is required on board, or if a maximum temperature is indicated in column (20) of the list;”

9.3.2.21.1 (g) and 9.3.3.21.1 (g) Amend to read as follows:

« (g) A closable connection for a closed-type or partly closed-type sampling device, and/or at least one sampling opening as required in column (13) of Table C of Chapter 3.2;

When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the flame arrester plate stack capable of withstanding steady burning of the sampling opening shall be selected according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2).”

9.3.2.21.7 and 9.3.3.21.7 Amend to read as follows:

“When the pressure or temperature exceeds a set value, instruments for measuring the vacuum or overpressure of the gaseous phase in the cargo tank or the temperature of the cargo shall activate a visual and audible alarm in the wheelhouse and on deck. The alarm must be relayed to the accommodation automatically if it has not been switched off.

When the pressure exceeds the set value during loading and unloading, the instrument for measuring the pressure shall, by means of the plug referred to in 9.3.x.21.5 above, immediately initiate an electrical contact which shall put into effect measures to interrupt the loading or unloading operation. When the vessel’s own discharge pump is used, it shall be switched off automatically.

The instrument for measuring the overpressure or vacuum shall activate the alarm at latest when:

- (a) An overpressure equal to 1.15 times the opening pressure of the pressure relief valves/ high velocity vent valves is reached; or
- (b) The lower threshold of the design pressure of the vacuum valves, but not exceeding a vacuum of 5 kPa (0.05 bar), is reached.

The maximum permissible temperature is indicated in column (20) of Table C of Chapter 3.2. The sensors for the alarms mentioned in this paragraph may be connected to the alarm device of the sensor.

When it is prescribed in column (20) of Table C of Chapter 3.2, the instrument for measuring the overpressure of the gaseous phase in the cargo tank shall actuate a visible and audible alarm in the wheelhouse when the overpressure exceeds 40 kPa (0.4 bar) during the voyage. The alarm must be relayed to the accommodation automatically if it has not been switched off. It shall be possible to read the gauges in direct proximity to the control for the water spray system.”.

9.3.2.22.4 Amend to read as follows:

“(a) Each cargo tank or group of cargo tanks connected to a common venting piping shall be fitted with:

- A connection for the safe return ashore of gases expelled during loading;
- A safe depressurization device for the cargo tanks, on which the position of the shut-off valve indicates clearly whether it is open or shut;
- Safety devices for preventing unacceptable overpressures or vacuums.

The opening pressure of the safety valves shall be permanently marked on the valves;

The setting of the pressure relief valves shall be such that during the transport operation they do not blow off until the maximum permissible working pressure of the cargo tanks is reached;

The gases shall be discharged upwards;

The outlets of the pressure relief valves shall be located not less than 1.00 m above the deck and at a distance of not less than 6.00 m from the openings of accommodation, the wheelhouse and the service spaces outside the cargo area. No equipment shall be present in a circle of 1.00 m radius around the outlet of the pressure relief valve outlets. This area shall be marked as a danger zone;

(b) When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2,

- At the connection to each cargo tank, the venting piping shall be equipped with a flame arrester capable of withstanding a detonation and
- The vacuum valve and the safe depressurization device for cargo tanks shall be designed to withstand a deflagration. The deflagration safety may also be ensured by a flame arrester.

(c) When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C in Chapter 3.2, or for which there is a T in column (3b) of Table C, the pressure relief valve shall be designed as a high velocity vent valve.

(d) If a shut-off device is to be mounted between the venting piping and the cargo tank, it shall be placed between the cargo tank and the flame arrester, and each cargo tank shall be equipped with pressure relief valves.

(e) The autonomous protection system mentioned in (b) and (c) shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2). The outlets of the high-velocity vent valves shall be located not less than 2.00 m above the deck and at a distance of not less than 6.00 m from the openings of the accommodations, the wheelhouse and the service spaces outside the cargo area. This height may be reduced to 1.00 m when there is no equipment and no work is being carried out within a radius of 1.00 m around the pressure relief valve outlet. This area shall be marked as a danger zone.

If the high velocity vent valve, the vacuum valve, the flame arresters and the venting piping are required to be heatable, the devices concerned shall be suitable for the relevant temperature.”.

9.3.3.22.4 Amend to read as follows:

“Each cargo tank or group of cargo tanks connected to venting piping shall be fitted with:

Open Type N:

- Devices to prevent unacceptable overpressures or vacuums and constructed so as to prevent any accumulation of water and its penetration into the cargo tank.

Open Type N with flame arresters:

- Devices to prevent unacceptable overpressures or vacuums, equipped with flame arresters capable of withstanding steady burning and constructed so as to prevent any accumulation of water and its penetration into the cargo tank.

The opening pressure of the safety valves shall be marked indelibly on the valves.

Closed Type N:

- (a) A connection for the safe return ashore of gases expelled during loading;
- (b) A safe depressurization device for the cargo tanks, on which the position of the shut-off valve indicates clearly whether it is open or shut;
- (c) Safety valves for preventing unacceptable overpressures or vacuums;

The opening pressure of the safety valves shall be marked indelibly on the valves;

- (d) When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2;
  - At the connection to each cargo tank, the venting piping shall be equipped with a flame arrester capable of withstanding a detonation;
  - The vacuum valve and the safe depressurization device for cargo tanks shall be deflagration safe. The deflagration safety may also be ensured by a flame arrester; and
  - The pressure relief device shall be designed as a high velocity vent valve, with the gases discharged upwards;

The setting of the pressure relief valves shall be such that during the transport operation they do not blow off until the maximum permissible working pressure of the cargo tanks is reached;

The autonomous protection systems shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2);

If the high velocity vent valve, the vacuum valve, the flame arresters and the venting piping are required to be heatable for transport, the safety devices concerned shall be suitable for the relevant temperature;

The opening pressure of the pressure relief valves, the vacuum valve and the high velocity vent valves shall be marked indelibly on the valves;

If a shut-off device is to be mounted between the venting piping and the cargo tank, it shall be placed between the cargo tank and the flame arrester, and each cargo tank shall be equipped with pressure relief valves;

- (e) The outlets of the high velocity vent valves shall be located not less than 2.00 m above the deck and at a distance of not less than 6.00 m from the openings of the accommodations, the wheelhouse and the service spaces outside the cargo area. This height may be reduced to 1.00 m when there is no equipment and no work is being carried out within a radius of 1.00 m around the pressure relief valve outlet. This area shall be marked as a danger zone.”.

9.3.2.22.5 and 9.3.3.22.5 Amend to read as follows:

**“Venting piping**

When two or more cargo tanks are connected to common venting piping, it is sufficient that the equipment according to 9.3.x.22.4 (safety valves to prevent unacceptable overpressures and vacuums, high velocity vent valve, vacuum valve protected against deflagrations, safe pressure relief device for cargo tanks protected against deflagrations) is installed on the joint venting piping (see also 7.2.4.16.7).

When each cargo tank is connected to its own venting piping, each cargo tank or the associated venting piping shall be equipped according to 9.3.x.22.4.”.

9.3.3.22.6 Delete: “, 9.3.3.22.4 (b)”.

9.3.1.25.3, 9.3.2.25.3 and 9.3.3.25.3 Delete and insert “(Deleted)”.

9.3.2.25.9 and 9.3.3.25.9:

- Replace “overpressure: 115 % of the opening pressure of the high velocity vent valve” by “overpressure: 1.15 times the opening pressure of the pressure relief valve/high velocity vent valve”.
- Replace “vacuum pressure: not more than the construction vacuum pressure but not exceeding 5 kPa (0.05 bar)” by “vacuum pressure: not more than the design pressure, but not exceeding a vacuum of 5 kPa (0.05 bar)”.

9.3.3.25.9 Delete “For open type N with flame arrester and open type N, the loading and unloading flows depend on the total cross section of the exhaust ducts.”. In subparagraph 4, replace “of the flame arrester” by “of the flame arresters”.

9.3.3.25.12 Delete: “, 9.3.3.25.3”.

9.3.2.26 and 9.3.3.26 Amend to read as follows: “Residual cargo tanks and receptacles for residual products”.

9.3.2.26.1 and 9.3.3.26.1 Amend to read as follows:

“When vessels are provided with tanks for residual products or receptacles for residual products, they shall be located in the cargo area and comply with the provisions of 9.3.x.26.2 and 9.3.x.26.3. Receptacles for residual products and receptacles for slops shall be located only in the cargo area on deck and not less than a quarter of the vessel’s breadth from the outer shell.”.

9.3.2.26.2 Amend to read as follows:

“Tanks for residual products shall be equipped with:

- A level gauge;
- Connections, with stop valves, for pipes and hose assemblies;
- A pressure relief/vacuum valve;

The pressure relief valve shall be sized so that, during the transport operation, it does not open when in normal operation. This condition is met when the opening pressure of the valve meets the conditions required in column (10) of Table C of Chapter 3.2 for the substances to be carried.

When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the vacuum valve shall be designed so as to be capable of withstanding a deflagration. The deflagration safety may also be ensured by a flame arrester.

When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C in Chapter 3.2, or for which there is a T in column (3b) of Table C, the pressure relief valve shall be designed as a high velocity vent valve.



The pressure relief valve shall be sized so that, during the transport operation, it does not open when in normal operation. This condition is met when the opening pressure of the valve meets the conditions required in column (10) of Table C of Chapter 3.2 for the substance to be carried.

The high velocity vent valve and the deflagration safe vacuum valve shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C in Chapter 3.2).

The maximum permissible capacity is 30 m<sup>3</sup>.”.

9.3.3.26.2 Amend to read as follows:

“Tanks for residual products shall be equipped with:

In the case of an open system:

- An ullage opening;
- Connections, with stop valves, for pipes and hose assemblies;
- A device for ensuring pressure equilibrium.

In the case of a protected system:

- An ullage opening;
- Connections, with stop valves, for pipes and hose assemblies;
- A flame arrester capable of withstanding steady burning.

In the case of a closed system:

- (a) A level indicator;
  - Connections, with stop valves, for pipes and hose assemblies;
  - A vacuum valve and a pressure relief valve;

The pressure relief valve shall be sized so that, during the transport operation, it does not open when in normal operation. This condition is met when the opening pressure of the valve meets the conditions required in column (10) of Table C of Chapter 3.2 for the substance to be carried;

- (b) When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the pressure relief valve shall be a high velocity vent valve and the vacuum valve shall be deflagration safe. The deflagration safety may also be ensured by a flame arrester;

The high velocity vent valve and the deflagration safe vacuum valve shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C in Chapter 3.2).

The maximum permissible capacity is 30 m<sup>3</sup>.”.

9.3.2.26.3 and 9.3.3.26.3 Amend to read as follows:

“The receptacles for residual products shall be equipped with:

- A possibility of indicating the degree of filling;
- Connections, with stop valves, for pipes and hose assemblies;
- A connection enabling gases released during filling to be evacuated safely.”.

9.3.2.26.4 and 9.3.3.26.4 Delete and insert “(Deleted)”.

9.3.3.26.5 Amend to read as follows:

“9.3.3.26.5 9.3.3.26.1, 9.3.3.26.2 (final sentence) and 9.3.3.26.3 do not apply to oil separator vessels.”

9.3.2.28 Replace “of the high velocity vent valves” by “of the pressure relief valves/high velocity vent valves”.

9.3.2.28 “Amendment to the German text does not apply to the French text. English text to be verified.”

9.3.3.28 Replace “of the high velocity vent valve” by “of the pressure relief valves/high velocity vent valves”.

9.3.3.28 “Amendment to the German text does not apply to the French text. English text to be verified.”

9.3.1.31.3, 9.3.2.31.3 and 9.3.3.31.3 Delete and insert “(Deleted)”.

9.3.1.31.4, 9.3.2.31.4 and 9.3.3.31.4 Delete and insert “(Deleted)”.

9.3.1.41.3, 9.3.2.41.3 and 9.3.3.41.3 Amend to read as follows:

“Only electrical lamps are permitted.”.

9.3.1.50, 9.3.2.50 and 9.3.3.50 Delete and insert “(Deleted)”.

9.3.1.51.1, 9.3.1.51.2 and 9.3.1.51.3: Delete.

9.3.2.51.1, 9.3.2.51.2 and 9.3.2.51.3: Delete.

9.3.3.51.1, 9.3.3.51.2 and 9.3.3.51.3: Delete.

9.3.1.51 and 9.3.2.51 Amend to read as follows:

**“Surface temperatures of installations and equipment**

- (a) Surface temperatures of electrical and non-electrical installations and equipment shall not exceed 200 °C.
- (b) Surface temperatures of the outer parts of engines and of their air inlets and exhaust ducts shall not exceed 200 °C;
- (c) When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which the temperature classes T4, T5 or T6 are indicated in column (15) of Table C of Chapter 3.2, the corresponding surface temperatures within the assigned zones shall not exceed 135 °C (T4), 100 °C (T5) or 85 °C (T6) respectively;
- (d) (a) and (b) do not apply if the following requirements are met (see also 7.2.3.51.4):
  - (i) Accommodation, wheelhouse and service spaces where surface temperatures higher than those mentioned in (a) and (b) occur are equipped with a ventilation system according to 9.3.x.12.4 (b); or
  - (ii) Installations and equipment which generate surface temperatures higher than those set out in (a) or (b), respectively, must be capable of being shut down. Such installations and equipment shall be marked in red.”.

9.3.3.51 Amend to read as follows:

**“Surface temperatures of installations and equipment**

- (a) Surface temperatures of electrical and non-electrical installations and equipment shall not exceed 200 °C;
- (b) Surface temperatures of the outer parts of engines and their air inlets and exhaust ducts shall not exceed 200 °C;
- (c) When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which the temperature classes T4, T5 or T6 are indicated in column (15) of Table C of Chapter 3.2, the corresponding surface temperatures within the assigned zones shall not exceed 135 °C (T4), 100 °C (T5) or 85 °C (T6), respectively;
- (d) (a) and (b) do not apply if the following requirements are met (see also 7.2.3.51.4):

- (i) Accommodation, wheelhouse and service spaces where surface temperatures higher than those mentioned in (a) and (b) occur are equipped with a ventilation system according to 9.3.x.12.4 (b); or
  - (ii) Installations and equipment which generate surface temperatures higher than those set out in (a) or (b), respectively, must be capable of being shut down. Such installations and equipment shall be marked in red;
- (e) Open Type N vessels are only required to meet the requirements of (a), (b) and (d) if the vessel remains in the immediate vicinity of or within a shoreside assigned zone.”.

9.3.1.52, 9.3.2.52 and 9.3.3.52 Amend to read as follows:

“Type and location of electrical installations and equipment”.

9.3.1.52.1, 9.3.2.52.1 and 9.3.3.52.1 Amend to read as follows:

“Electrical installations and equipment shall be of at least the ‘limited explosion risk’ type.”.

This provision does not apply to:

- (a) Lighting installations in the accommodation and the wheelhouse, except for switches near to the entrances;
- (b) Mobile phones, fixed telephone installations and loading instruments in the accommodation or the wheelhouse;
- (c) Electrical installations and equipment which, during a stay in the immediate vicinity of or within a shoreside assigned zone:
  - (i) Are extinguished; or
  - (ii) Are placed in premises equipped with a ventilation system according to 9.3.x.12.4;
- (d) To radiotelephone installations and inland AIS (automatic identification systems) stations in the accommodation and the wheelhouse, if no part of an aerial for radiotelephone installations or AIS stations is situated above or within 2.00 m of the cargo area.”.

9.3.1.52.2, 9.3.2.52.2 and 9.3.3.52.2 Amend to read as follows:

“In the cofferdams, double-hull spaces, double bottoms and hold spaces, only hermetically sealed echo sounding devices are allowed, the cables of which are led through thick-walled steel tubes with gastight connections up to the main deck.”.

9.3.1.52.3, 9.3.2.52.3 and 9.3.3.52.3 Amend to read as follows:

“The fixed electrical installations and equipment which do not meet the requirements set out in 9.3.x.51 (a), 9.3.x.51 (b) and 9.1.x.52.1 above and their switches shall be marked in red. The disconnection of such equipment shall be controlled from a centralized location on board.”.

9.3.1.52.4, 9.3.2.52.4 and 9.3.3.52.4 Amend to read as follows:

“Every insulated distribution network shall be fitted with an automatic device with a visual and audible alarm for checking the insulation level.”.

9.3.1.52.5, 9.3.2.52.5 and 9.3.3.52.5 Amend to read as follows:

“Only distribution systems without return connection to the hull are permitted. This provision does not apply to:

- Active cathodic corrosion protection;
- Certain limited sections of the installations situated outside the cargo area (e.g., connections of starters of diesel engines);
- The device for checking the insulation level referred to in 9.3.x.52.4.”.

9.3.1.52.6, 9.3.2.52.6 and 9.3.3.52.6 Amend to read as follows:

“For movable electrical cables intended for signal lights and gangway lighting, only sheathed cables of type H07RN-F in accordance with standard IEC 60245-4:2011 or electrical cables of at least equivalent design having conductors with a cross-section of not less than 1.50 mm<sup>2</sup> shall be used. These electrical cables shall be as short as possible and protected against mechanical damage.”

9.3.1.52.7, 9.3.2.52.7 and 9.3.3.52.7 Amend to read as follows:

“Failure of the power supply for the safety and control equipment shall be immediately indicated by visual and audible signals in the wheelhouse and on the deck. The alarm must be relayed to the accommodation automatically if it has not been switched off.”

9.3.1.52, 9.3.2.52 and 9.3.3.52 Insert the following new paragraphs:

“9.3.x.52.8 Electrical switches, sockets and cables on deck shall be protected against mechanical damage.

9.3.x.52.9 Sockets for the connection of signal lights and gangway lighting shall be solidly fitted to the vessel close to the signal mast or the gangway. The sockets used in this area shall be designed so as to prevent connection or disconnection except when they are not live.

9.3.x.52.10 Accumulators shall be located outside the cargo area.”

9.3.3.52 Insert the following new paragraphs:

“9.3.3.52.11 Open Type N vessels are only required to meet the requirements of 9.3.3.52.1 and 9.3.3.52.3 if the vessel remains in the immediate vicinity of or within a shoreside assigned zone.”

9.3.3.52.12 An electric generator which is permanently driven by an engine and which does not meet the requirements of 9.3.1.52.3 above shall be fitted with a switch capable of shutting down the excitation of the generator. A notice board with the operating instructions shall be displayed near the switch.”

9.3.1.53, 9.3.2.53 and 9.3.3.53, title Amend to read as follows:

**“Type and location of electrical and non-electrical installations and equipment intended to be used in explosion danger areas”**

9.3.1.53.1, 9.3.2.53.1 and 9.3.3.53.1 Amend to read as follows:

“On board vessels covered by the classification of zones as defined in 1.2.1, electrical and non-electrical installations and equipment used in explosion danger areas shall meet at least the requirements for use in the area concerned.

They shall be selected on the basis of the explosion groups/subgroups and temperature classes to which the substances to be carried belong (see columns (15) and (16) of Table C of Chapter 3.2).

When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which temperature classes T4, T5 or T6 are indicated in column (15) of Table C of Chapter 3.2, the corresponding surface temperatures within the assigned zones shall not exceed 135 °C (T4), 100 °C (T5) or 85 °C (T6).

When the list of substances on the vessel according to 1.16.1.2.5 will contain substances for which temperature classes T1 or T2 are indicated in column (15) of Table C of Chapter 3.2, the corresponding surface temperatures within the assigned zones shall not exceed 200 °C.”

9.3.1.53.2, 9.3.2.53.2 and 9.3.3.53.2 Amend to read as follows:

“Except in the case of optical fibres, electrical cables shall be armoured or placed in a metallic sheath or in protective tubes.

Electrical cables for the active cathodic protection of the shell plating shall be led through thick-walled steel tubes with gastight connections up to the main deck.”

9.3.1.53.3 and 9.3.2.53.3 Amend to read as follows:

“Except for intrinsically safe electric circuits or for the supply of signal lights and gangway lighting, movable electrical cables are prohibited.”.

9.3.3.53.3 Amend to read as follows:

“Except for intrinsically safe electric circuits or for the supply of signal lights and gangway lighting and submerged pumps on oil separator vessels, movable electrical cables are prohibited.”.

9.3.1.53.4, 9.3.2.53.4 and 9.3.3.53.4 Amend to read as follows:

“Electrical cables of intrinsically safe circuits shall be separated from other cables not intended for use in such circuits and shall be marked (they shall not be installed together in the same string of cables and they shall not be fixed by the same cable clamps).”.

9.3.x.54 Insert the following new paragraphs:

“9.3.x.54 Earthing

9.3.x.54.1 The metal parts of electrical installations and equipment in the cargo area which are not live, as well as the protective metal tubes or metal sheaths of cables, in normal service shall be earthed, unless they are so arranged that they are automatically earthed by bonding to the metal structure of the vessel.

9.3.x.54.2 The provisions of 9.3.x.54.1 also apply to installations with a voltage of less than 50 Volts.

9.3.x.54.3 Independent cargo tanks, metal intermediate bulk containers and tank-containers shall be earthed.

9.3.x.54.4 Receptacles for residual products shall be capable of being earthed.”.

9.3.x.54 Replace “9.3.x.54-9.3.x.55 (reserved)” by “9.3.x.55 (reserved)”.

9.3.x.56 Delete and insert “(Deleted)”.

9.3.x.56.1 Delete.

9.3.x.56.2 Delete.

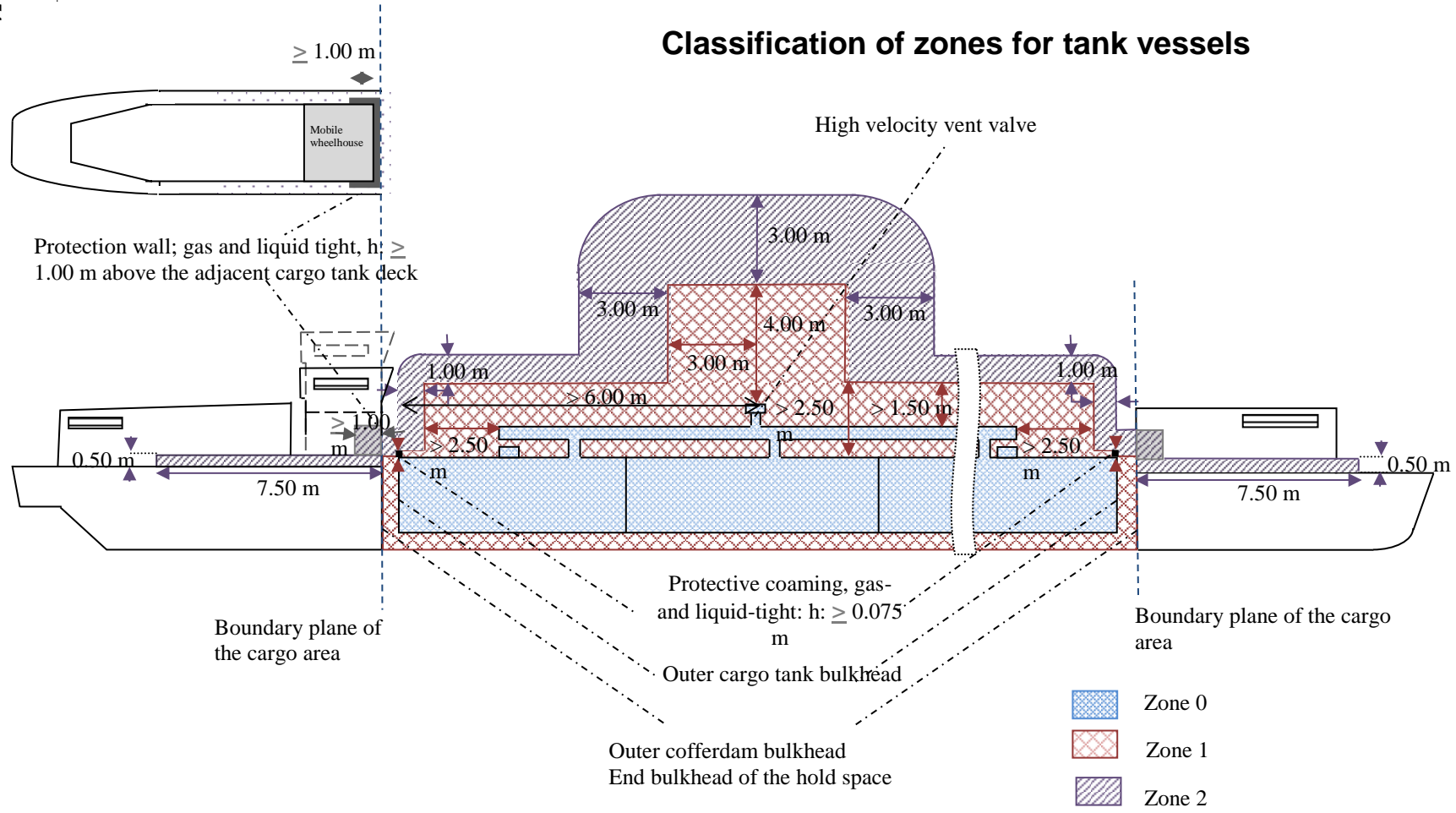
9.3.x.56.3 Delete.

9.3.x.56.4 Delete.

9.3.x.56.5 Delete.

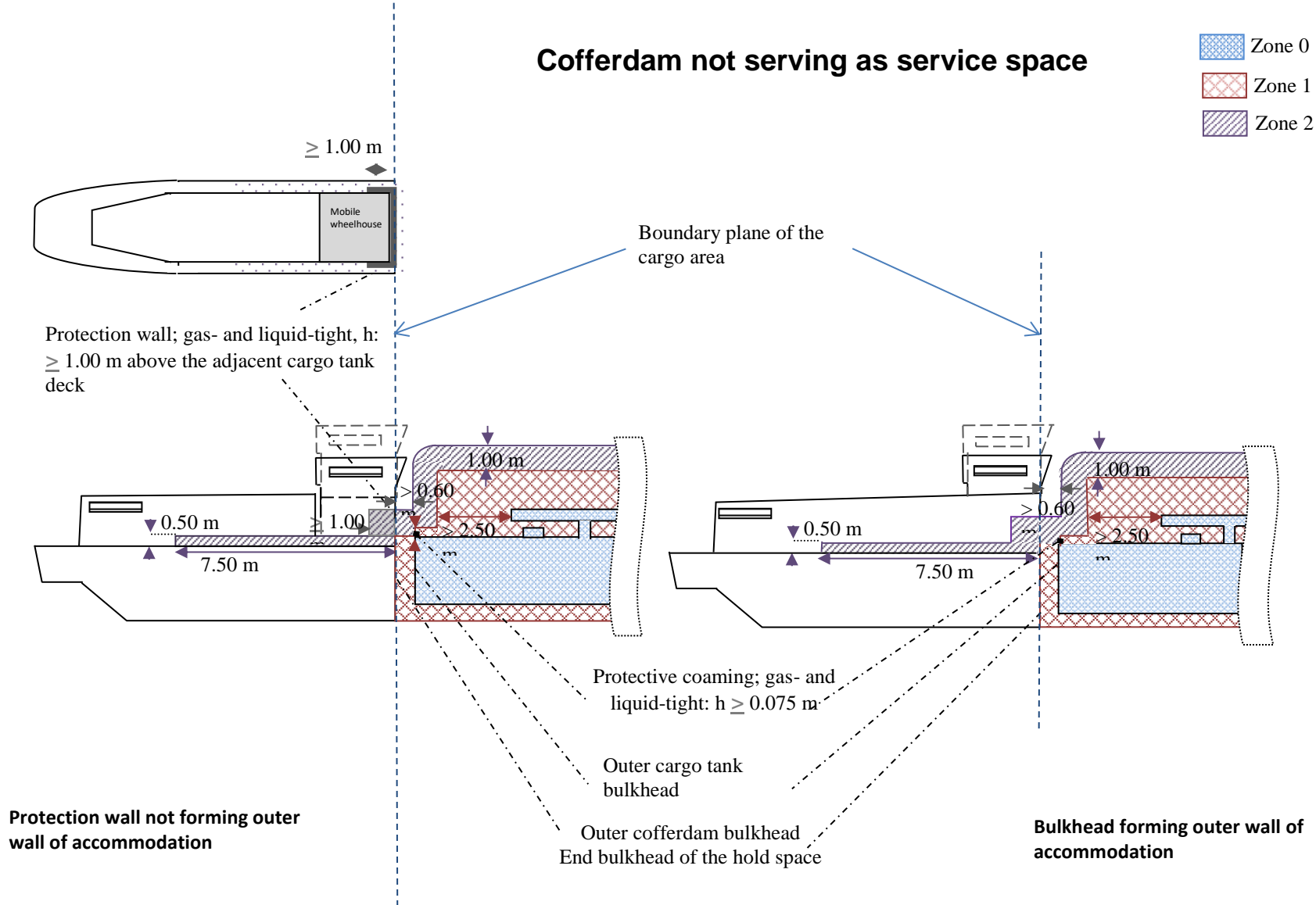
9.3.x.56.6 Delete.

# Classification of zones for tank vessels






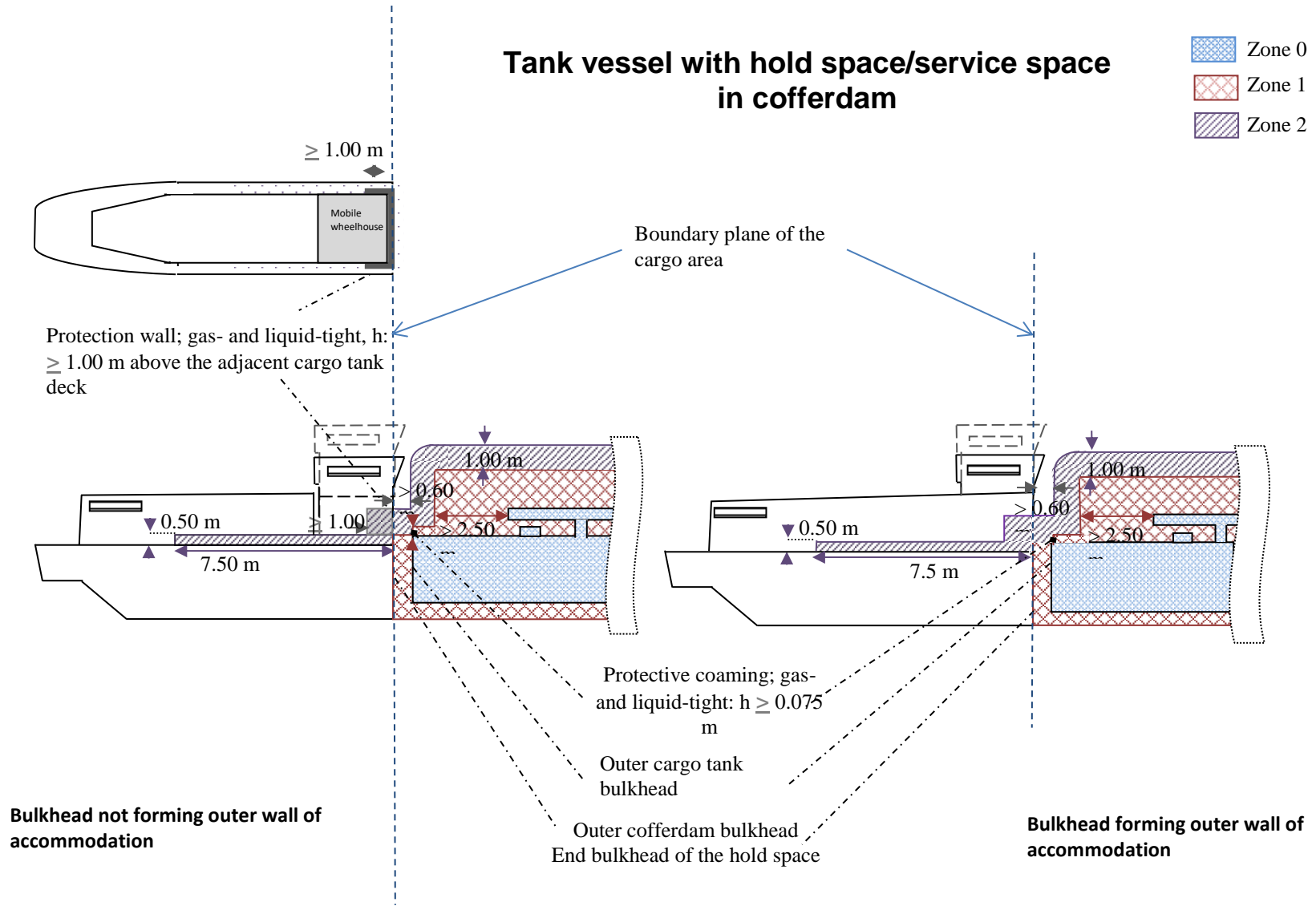
### Cofferdam not serving as service space

- Zone 0
- Zone 1
- Zone 2



### Tank vessel with hold space/service space in cofferdam

-  Zone 0
-  Zone 1
-  Zone 2





## Proposed editorial changes

In the definition of “*Receptacle for residual products*”, at the beginning of the first sentence, delete: “a tank.”. At the end, insert a new second sentence to read as follows:

“The receptacle shall be approved according to ADR, RID or the IMDG Code and authorized for the substance concerned. The maximum permissible capacity of an intermediate bulk container is 3 m<sup>3</sup>, and that of a tank-container or portable tank is 12 m<sup>3</sup>;”.

1.2.1 Amend the definition of “Receptacle for slops” to read as follows:

“Receptacle for slops means a fire resistant receptacle capable of being closed with a lid intended to collect slops which are unsuitable for pumping. The receptacle shall be approved according to ADR, RID or the IMDG Code and authorized for the substance concerned. The maximum permissible capacity is 450 l.”. It should be easy to handle and marked “SLOP” (character height: 0.10 m);”.

7.2.4.1.1 Amend the first indent to read as follows:

“- residual cargo, washing water, cargo residues and slops contained in no more than six approved receptacles for residual products and receptacles for slops having a maximum total capacity of not more than 12 m<sup>3</sup>. The receptacles for residual products and the receptacles for slops shall be properly secured in the cargo area, be located at a minimum distance from the hull equal to one quarter of the vessel’s breadth and comply with the provisions of 9.3.2.26.3 or 9.3.3.26.3 concerning them.”.

7.2.4.15.2 Amend to read as follows:

“During the filling of the residual tanks and receptacles for residual products, released gases shall be safely evacuated. They shall only be connected to the venting piping for the time necessary to fill them.

Capacity to collect any leaking liquids shall be placed under the connections used during filling.”.

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