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Working Party on Inland Water Transport

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Geneva, 12–14 October 2022
Item 7 (b) of the provisional agenda
Standardization of technical and safety requirements in inland navigation: Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels (resolution No. 61, revision 2)

Amendments to the annex to resolution No. 61 on Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels, revision 2

Note by the secretariat

Mandate

1. This document is submitted in line with the Proposed Programme Budget for 2022, part V, Regional cooperation for development, section 20, Economic Development in Europe, Programme 17, Economic Development in Europe (A/76/6 (Sect. 20), paragraph 20.76).

2. At its sixty-first session, the Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation (SC.3/WP.3) preliminarily approved the draft amendments to chapters 1, 8, 9, 15 and annexes 1 and 3 of the annex to resolution No. 61, revision 2 (ECE/TRANS/SC.3/2020/7 and ECE/TRANS/SC.3/WP.3/2021/16). The secretariat was asked to transmit the draft to the Working Party on Inland Water Transport (SC.3) for the final adoption.

3. SC.3 may wish to adopt the proposed amendments as amendment No. 4 to resolution No. 61, revision 2. The draft resolution of SC.3 is contained in annex I and the consolidated text of the amendments – in annex II.

Annex I

Amendments to the annex to Resolution No. 61 on Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels, revision 2

Resolution No. …
(adopted by the Working Party on Inland Water Transport on …)

The Working Party on Inland Water Transport,

Responding to the strategic recommendations set out in the Ministerial declaration "Inland Navigation in a Global Setting" (18 April 2018, Wroclaw, Poland),

Responding also to resolution No. 265 "Facilitating the Development of Inland Water Transport", adopted by the Inland Transport Committee at its eighty-first session on 22 February 2019,

Responding further to Policy recommendation No. 4 of the White Paper on the Progress, Accomplishments and Future of Sustainable Inland Water Transport (ECE/TRANS/SC.3/279) encouraging modernization and greening of the fleet and infrastructure to better tackle environmental challenges,

Acknowledging the role of modern technologies and innovations in ensuring safety of people and cargoes transported on inland navigation vessels, reducing harmful emissions from vessels and facilitating the transition to zero emission transport mode,

Bearing in mind the ongoing work aimed at enhancing navigation safety, modernization and greening of the inland navigation fleet and automation in inland navigation by member States, the European Commission, the European Committee for Drawing up Standards in the Field of Inland Navigation (CESNI), River Commissions and other key players,

Reaffirming the desirability of further developing resolution No. 61 with due regard to the latest updates of the European regulatory framework laying down technical requirements for inland waterway vessels and with a view of ensuring harmonization of technical requirements for inland navigation vessels at a pan-European level,

Considering resolution No. 61 of the Working Party on Inland Water Transport on the Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels, revision 2 (ECE/TRANS/SC.3/172/Rev.2), as amended by its resolutions Nos. 93, 98 and 103,

Bearing in mind the report of the Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation on its sixty-first session,

Decides to amend and supplement the text of the annex to Resolution No. 61, revision 2, as reflected in the annex to this resolution.

Annex II

Amendments to the Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels (annex to resolution No. 61, revision 2)

I. Chapter 4 “Safety Clearance, Freeboard and Draught Marks”

1. Section 4-3, *modify*

4-3 DRAUGHT MARKS

4-3.1 The plane of maximum draught shall be determined in such a way that the specifications concerning minimum freeboard and minimum safety clearance and the vessel’s maximum design draught are all met. However, for safety reasons, the competent authority may lay down a greater value for the safety clearance or freeboard. The plane of maximum draught shall be determined at least for zone 3.

4-3.2 The plane of maximum draught shall be indicated by means of highly visible, indelible draught marks.

4-3.3 Draught marks are to be designed as follows:

(a) The topmost draught mark points towards the stern and is a rectangle 300 mm long and 30 mm high~~,~~ the baseline of which is horizontal and coincides with the plane of the maximum authorized draught. If the topmost draught mark is the one applicable to zone 3, it is 40 mm high.

(b) The additional draught marks to be added point towards the bow and the following provisions apply:

(i) Draught marks for zone 3 comprise a rectangle 300 mm long and 40 mm high;

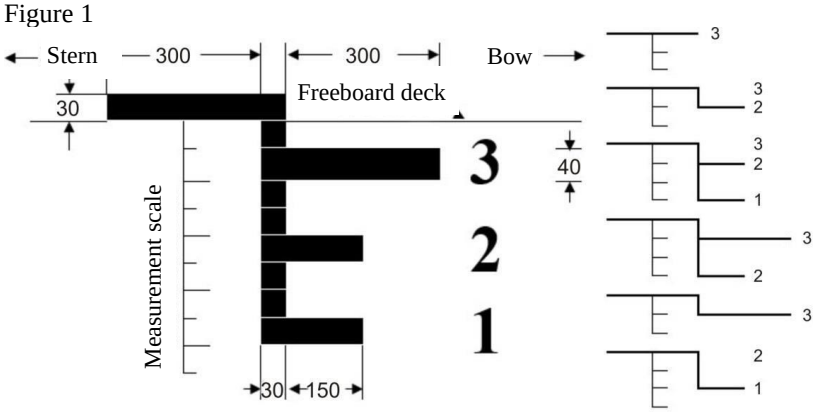
(ii) Draught marks for zones 1 and 2 comprise a rectangle 150 mm long and 30 mm high, the baseline of which is horizontal and coincides with the plane of the maximal authorized draught.

(c) If the draught mark to be added for zone 3 or 4 coincides with the uppermost draught mark, the latter can be dispensed with.

4-3.4 The number of the zone, in characters 60 mm high × 40 mm deep, is to be added next to the draught marks towards the bow; in the case of zone 4, the number can be dispensed with.

4-3.5 The draught marks according to paragraphs 4-3.3 and 4-3.4 and their orientation are to be in accordance with figure 1.

Figure 1



4-3.6 Vessels shall have at least three pairs of draught marks, of which one pair shall be centrally located and the two others located, respectively, at a distance from the bow and stern that is equal to roughly one-sixth of the length.

4-3.7 Marks or indications which cease to be valid following a further inspection shall be deleted or marked as being no longer valid under the supervision of the Administration. Illegible draught marks may only be replaced under the supervision of the Administration.

4-3.8 Where a vessel has been measured in implementation of the 1966 Convention on the Measurement of Inland Navigation Vessels and the measurement mark is at the same height as the uppermost of the draught marks prescribed in paragraph 4-3.4 this measurement mark shall take the place of the draught marks for this zone; this shall be mentioned in the ship's certificate.

4-3.9 By way of derogation from paragraph 4-3.3:

(a) Where a vessel is less than 40 m in length *L* it will suffice to affix two pairs of draught marks at a distance from the bow and stern, respectively, that is equal to approximately a quarter of the length *L*;

(b) Where vessels are not intended for the carriage of goods, a pair of draught marks located roughly halfway along the vessel will suffice.

4-3.10 If the plane of maximum draught of a vessel for one or more zones has been determined by assuming that the holds may be closed in such a way as to make them spray-proof and weathertight, and if the distance between the plane of maximum draught and the upper edge of the coamings is less than the permissible safety clearance for the zone in question, the maximum draught for sailing with uncovered holds shall be determined.

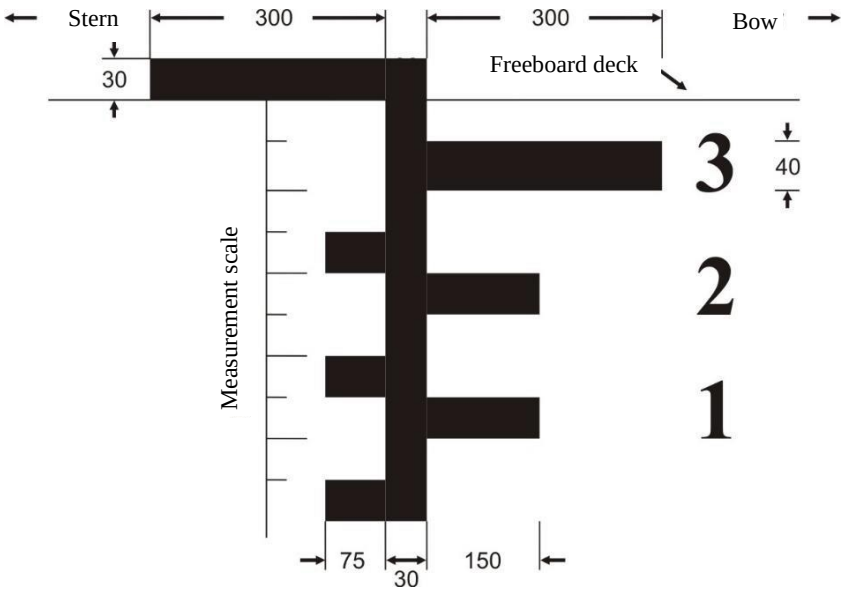
The following statement shall be entered on the ship's certificate:

"Where the hold hatches are totally or partly uncovered the vessel may only be loaded up to … mm below the draught marks for zone … ."

4-3.11 In the case of vessels with open holds, in addition to the provisions of paragraph 4-3.6 the draught marks for the relevant zones are to be supplemented by a rectangle 75 mm long by 30 mm high, pointing aft, the base of which is horizontal and coinciding with the level of the maximum permissible draught for navigation in the zone in question with open holds.

4-3.12 The draught marks according to paragraph 4-3.11 and their orientation are to be in accordance with figure 2.

Figure 2



2. *Add* a new section 4-3A

4-3A DRAUGHT SCALES, DECK LINE AND FREEBOARD MARK

4-3A.1 Vessels whose draught may exceed 1 m shall bear a draught scale on each of their sides towards the stern; they may bear additional draught scales.

4-3A.2 The zero points on each draught scale shall be taken vertically to this within the plane running parallel to the plane of maximum draught passing through the lowest point of the hull or of the keel where such exists. The vertical distance above the zero point shall be graduated in decimetres. That graduation shall be located on each scale, from the unladen water line up to 100 mm above the maximum draught by means of punched or chiselled marks, and shall be painted in the form of a highly-visible band in two alternating colours. That graduation shall be identified by figures at a distance of every five decimetres marked next to the scale as well as at the top of the scale.

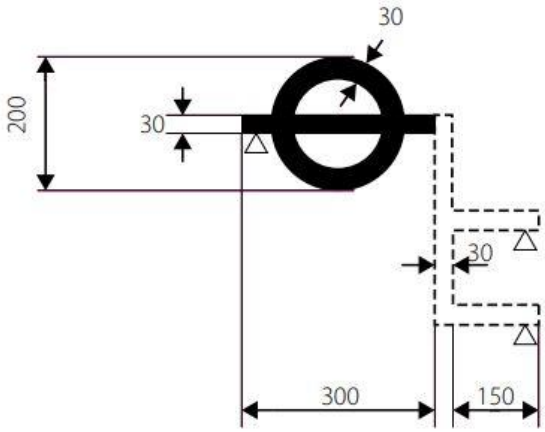
4-3A.3 The two stern measurement scales affixed pursuant to the 1966 Convention on the Measurement of Inland Navigation Vessels may replace the draught scales, provided that they include a graduation that meets the requirements plus, where appropriate, figures indicating the draught.

4-3A.4 The centrally located measurement/draught scale for zones 1 and 2 may be replaced by a freeboard mark.

The freeboard mark consists of a ring intersected through its centre by a horizontal line which shall be supplemented, if necessary, by additional freeboard lines.

The width of the ring and of all the other lines of the freeboard mark shall be 30 mm; the outer diameter of the ring shall be 200 mm; the length of the horizontal line intersecting the ring shall be 300 mm; and the size of the numerals designating the zones shall be 60 x 40 mm (see figure 3).

Figure 3
Freeboard mark



The centre of the ring shall be placed amidships. The lower edge of the horizontal line which intersects the ring shall pass through the centre of the ring and shall constitute the freeboard line.

If the vessel is intended to navigate in several navigation zones, a vertical line and additional freeboard lines 150 mm in length shall be applied forward of the centre of the ring.

4-3A.5 Deck line and freeboard mark

When the centrally located measurement/draught scale has been replaced by a freeboard mark, the deck line must be indicated by the upper edge of a horizontal rectangle 300 mm long and 25 mm wide. This rectangle shall be marked amidships on each side of the hull, and its upper edge shall normally pass through the point where the continuation outwards of the upper surface of the freeboard deck intersects the outer surface of the shell amidships. However, the deck line may also be marked at a different height provided that the freeboard is corrected accordingly. The distance between the upper edge of the deck line and the freeboard mark constitutes the freeboard as mentioned in section 4-4.1.

3. Section 4-4:

(a) *Add* a new paragraph 4-4.1.5

4-4.1.5 For vessels intended to operate in zones 1 and 2, the Administration may take into account salinity when calculating freeboard.

(b) *Add* a new paragraph 4-4.2.8

4-4.2.8 However, for safety reasons, the Administration may lay down a greater value for the freeboard.

4. Section 4-5

Paragraph 4-5.3, *modify*

4-5.3 For open vessels navigating in zone 3, the safety clearance shall be increased in such a way that each of openings that cannot be closed by spray-proof and weathertight devices shall be at least 500 mm from the plane of maximum draught.

5. Section 4-8, d*elete*.

II. Chapter 8 “Engine Design”

6. *Add* a new section 8-3

8-3 NOISE EMITTED BY VESSELS

8-3.1 The noise produced by a vessel under way, and in particular the engine air intake and exhaust noises, shall be damped by using appropriate means.

8-3.2 The sound pressure level of the noise generated by a vessel under way shall not exceed 70 dB(A) at a lateral distance of 25 m from the ship's side.

8-3.3 Apart from transhipment operations, the sound pressure level of the noise generated by a stationary vessel shall not exceed 60 dB(A) at a lateral distance of 25 m from the ship's side.

III. Chapter 9 “Electrical Installations”

7. Section 9-2.6, *modify*

9-2.6 BATTERIES, ACCUMULATORS AND THEIR CHARGING DEVICES

9-2.6.1 The accumulators shall be of a construction suitable for use on board a vessel. They shall be grouped in boxes or trays fitted with grips to facilitate handling. Cell boxes shall be made of a shock-resistant material that does not easily catch fire and shall be so made as to prevent any spillage of electrolyte at an inclination of 40° from the vertical.

9-2.6.2 Accumulators shall be so arranged as not to shift with the movements of the vessel. They shall not be exposed to excessive heat, extreme cold, spray, steam or vapour. Accumulator batteries shall be installed so as to permit easy access for replacement, topping up and cleaning of the elements, with a space of not less then 15 mm all around them to allow air to circulate, and with no more than 1.5 m separating the deck from the plugs in the uppermost bank. If accumulators are installed on two or more shelves one above the other, at least 50 mm space shall be left at the front and back of each shelf to allow air to circulate.

Accumulator batteries shall not be installed in the wheelhouse, accommodation or holds.

This requirement shall not apply to accumulators for portable appliances, or to accumulators requiring a charging power of less than 0.2 kW.

9-2.6.3 Accumulator batteries requiring a charging power of more than 2.0 kW (calculated from the maximum charging current and the nominal voltage of the battery, taking into account the characteristic charging curves of the charging device) shall be installed in a special battery room. If placed on deck, they shall be enclosed in a cupboard or chest. If gas can escape from accumulators, this room or cupboard must be mechanically ventilated to the open deck (supply and exhaust air).

Accumulator batteries requiring a charging power not exceeding 2.0 kW may be installed below decks in a cupboard or chest. They may also be installed without casing in an engine room, electrical service room or any other well-ventilated place provided that they are protected against falling objects and dripping water.

Special battery rooms shall be capable of being heated when the temperature inside them falls below 5°C.

9-2.6.4 The interior surfaces of all battery rooms, including cupboards, lockers, shelving and other built-in fixtures, shall be protected against action of the electrolyte by a coat of paint or a lining made of a material resistant to the electrolyte.

9-2.6.5 Provision shall be made for effective ventilation when batteries are installed in a closed compartment, cupboard or chest. Forced-draught ventilation shall

be provided for nickel-cadmium accumulators requiring a charging power of more than 2**.0** kW and for lead-acid accumulators requiring more than 3**.0** kW.

The air shall enter at the bottom and be discharged at the top so that the whole of the battery is swept by the air stream. Ventilation ducts shall not include devices which obstruct the air flow.

The minimum air throughput for ventilation, [m^3/h], shall be calculated by the following formula:

$$Q = \boldsymbol{f} \times I \times n \quad [m^3/h]$$

where:

f = 0.11 for accumulators with liquid electrolytes;

f = 0.03 for accumulators with enclosed cells (electrolyte immobilised in gel, non-woven fibrous material);

I – the maximum charging current (it shall be not less than one quarter of the maximum current admissible by the charging device), [A];

n – the number of cells in series circuit.

In the case of buffer accumulators of the onboard network, other methods of calculation taking into account the characteristic charging curve of the charging devices may be accepted by the Administration, provided that these methods are based on the provisions of recognised classification societies or on relevant standards.

9-2.6.6 Where natural ventilation is used, the cross-section of the ducts shall be sufficient for the required air throughput at an air-flow velocity of 0.5 m/s. It shall be not less than 80 cm^2 for lead batteries and not less than 120 cm^2 for alkaline batteries.

9-2.6.7 Where the required ventilation cannot be obtained by natural air flow, an exhauster fan shall be provided; its motor shall be clear of the gas stream.

Special devices shall be provided to prevent gases from entering the motor.

Fans shall be of a construction and material precluding the production of sparks through contact between a blade and the fan casing. In addition, the material shall be such as to dissipate any electrostatic charges. Warning symbols “No naked lights or fires and no smoking” corresponding to sketch 2 of appendix 3 with a diameter of at least 10 cm shall be placed on the doors of rooms or cupboards, or the covers of chests, containing batteries.

9-2.6.8 Charging devices must basically be designed so that discharged accumulators can be recharged within a maximum of 15 hours to 80 % of their nominal capacity, without exceeding the amperage of maximum permissible charge rate.

9-2.6.9 Only automatic charging devices which correspond to the charging characteristics of the accumulator type must be used.

9-2.6.10 For the simultaneous supply of consumer equipment while charging, the power requirements of the consumer equipment must be taken into account when selecting the charger. A charging voltage of up to a maximum of 120 % of the rated voltage must be observed irrespective of the current power requirements. The figure increases to 125 % for traction batteries.

9-2.6.11 The requirements of international standards IEC 62619:2017 and IEC 62620:2014 shall apply for lithium-ion accumulators.

9-2.6.12 Accumulator management systems for monitoring the accumulators are to be used if possible. Lithium-ion accumulators must be equipped with such systems.

These systems shall at a minimum comprise the following functionality:

(a) Cell protection (short-circuit, external, internal, overcurrent, deep discharge, etc.);

(b) Charge control, provided this is not by means of the charger;

(c) Load management;

(d) Determination of the charge level;

(e) Balancing of the cells;

(f) Thermal management.

Depending on use, if possible, they should also feature the following functionality:

(g) Determination of ageing, remaining capacity, internal resistance etc.;

(h) Communication (e.g. with inverters and control devices);

(i) Authentication and identification;

(j) History.

9-2.6.13 Rooms in which lithium-ion accumulators are stored shall comply with the following requirements:

(a) These rooms shall be protected against fire of one or several lithium-ion accumulators on the basis of a fire protection concept developed by an expert:

(i) Having regard to the other equipment located in the same room,

(ii) Having regard to instructions of the manufacturer of the lithium-ion accumulators,

(iii) Including provisions for alarm systems.

A fire protection concept may be dispensed with if the lithium-ion accumulators are stored in a fireproof enclosure, which is equipped,

(iv) With at least one monitoring device (fire and thermal runaway) and

(v) With one suitable fixed fire-extinguishing installation for protecting objects.

(b) In the case referred to in (a) first sentence, these rooms shall be shielded with A-60 partitions.

(c) These rooms or the lithium-ion accumulators housed in a fireproof enclosure shall be mechanically ventilated to the open deck. The exhaust outlet of the ventilation shall be located in such a way that the safety of persons on board is not endangered.

These requirements do not apply if the cumulative capacity of the lithium-ion accumulators in the room is below 20 kWh.

9-2.6.14 The requirements of paragraphs 9-2.6.12 and 9-2.6.13 do not apply to accumulators with a charging power of less than 0.2 kW.

9-2.6.15 For batteries, paragraphs 9-2.6.1 to 9-2.6.8 and 9-2.6.12 shall apply *mutatis mutandis*.

IV. Chapter 9A “Special Provisions Applicable to Electric Vessel Propulsion”

8. *Add* a new chapter 9A“Special Provisions Applicable to Electric Vessel Propulsion”

9A-0 DEFINITIONS

For the purposes of this chapter, the following definitions shall apply:

1. “Propulsion installation”: a unit comprising an electrical power source including power electronics, electric propulsion motor, gearbox, shaft, propeller, etc. employed to generate movement of a craft;

2. “Electric vessel propulsion system”: either a purely electric or a diesel-electric or gas-electric propulsion installation of a craft, which is operated either by its own power supply or by the on-board electrical network and comprising at least one electric propulsion motor. In the case of a diesel-electric or gas-electric propulsion installation, this term refers solely to the electrical components of the propulsion installation in question;

3. “Electric main propulsion system”: an electric vessel propulsion system which is applied to achieve the manoeuvrability laid down in chapter 5;

4. “Electric auxiliary propulsion system”: an additional electric vessel propulsion system of a craft that is not an electric main propulsion system;

5. “Electric propulsion motor”: an electric motor to propel the propeller shaft or the shaft of comparable propulsion installations such as water-jet propulsion devices.

9A-1 GENERAL PROVISIONS FOR ELECTRIC VESSEL PROPULSION

9A-1.1 A craft’s electric main propulsion system must consist of at least:

(a) Two electrical power sources, irrespective of the number of main propulsion units,

(b) A switchgear,

(c) An electric propulsion motor,

(d) Steering positions and

(e) Depending on the design of the electric main propulsion system, the corresponding power electronics.

9A-1.2 If an electric main propulsion system is equipped with only one propulsion motor and if the craft has no additional vessel propulsion system that ensures sufficient propulsion power, the electric main propulsion system must be designed in such a way that the craft is still capable of making steerageway under its own power while retaining the required manoeuvrability in the following cases:

(a) Failure in the power electronics or

(b) Failure in the system of regulation and control of the propulsion installation.

9A-1.3 The general plans concerning the entire electrical installation pursuant to paragraph 9-1.3, subparagraph (i) shall also include the locations of the main components and the electrical service rooms of the electric vessel propulsion system.

9A-1.4 If the electric propulsion motors are fed by batteries or accumulators, their current capacity must be monitored and displayed.

It must be ensured that the capacity of batteries or accumulators shall enable the safe reaching of a berth or authorized anchorage area under the craft’s own power at all times and under all conditions.

In the event of a drop of the capacity of batteries or accumulators to the minimum residual capacity required pursuant to the second sentence, an optical and acoustic alarm is to be triggered and displayed in the wheelhouse.

9A-1.5 If the electric vessel propulsion system is gas-electric or diesel-electric, the electrical components must not negatively affect the gas or diesel engines control systems.

9A-1.6 A malfunction of the electric vessel propulsion system shall not obstruct the operation of the craft such that the emergency systems provided for in accordance

with this annex, in particular, the steerageway under its own power or the emergency electrical power supply, are affected.

9A-1.7 Two electric vessel propulsions systems can only be deemed independent if the power supply circuits of the electric propulsion motor are completely separate from one another or if an FMEA-S[1] safety study demonstrates that no failure of one electric propulsion system impairs the operation of the other.

9A-1.8 It must be possible to shut down or deactivate an electric vessel propulsion system manually in an emergency.

9A-2 GENERATORS, TRANSFORMERS AND SWITCHGEAR FOR ELECTRIC VESSEL PROPULSION

9A-2.1 The generators, transformers and switchgear must be designed for:

(a) Temporary overloads and

(b) The effects of manoeuvres according to their application and operating conditions.

9A-2.2 The diesel or gas regulators of diesel or gas engines for electric propulsion systems must ensure safe operation over the entire speed range and for all sailing and manoeuvring conditions in single and parallel operation.

If an electrical power source set fails according to paragraph 9A-1.1, subparagraph (a), there must be an automatic reduction in power so that the electric main propulsion system continues with reduced power such that the craft is still capable of making steerageway under its own power.

9A-2.3 The electrical power sources—according to paragraph 9A-1.1, subparagraph (a), of the generators must be designed so that they can record the reverse power occurring during reversing manoeuvres when considering the propulsion concept.

9A-2.4 Generators must be capable of being switched on and off without interrupting electric main propulsion.

9A-3 ELECTRIC PROPULSION MOTORS FOR ELECTRIC VESSEL PROPULSION

9A-3.1 According to their application and operating conditions, electric propulsion motors for electric vessel propulsion must be designed for:

(a) Temporary overloads and

(b) The effects of manoeuvres.

9A-3.2 Electric propulsion motors must be designed in such a way that harmonics of currents and voltages do not impair their safe operation.

9A-3.3 Insulating materials of classes B, F or H according to international standard IEC 60085-2007, “Electrical insulation”, are to be used for the insulation of the windings.

9A-3.4 The main propulsion systems’ propulsion engines, both electric and with external cooling, must be dimensioned such that, should the external cooling fail, they are still capable of operating on reduced power so that the craft is at least capable of making steerageway under its own power.

9A-3.5 Electric propulsion motors must withstand a short-circuit at their terminals and in the propulsion installation without damage under rated operating conditions until the protective device is triggered. Fuses may not be used as protection for the main circuits and excitation circuits of electric propulsion motors.

[1] Failure modes and effects analysis.

9A-4 POWER ELECTRONICS FOR ELECTRIC VESSEL PROPULSION

9A-4.1 The power electronics requirements according to paragraphs 9-2.18 and 9-2-19 shall apply with the following provisions.

9A-4.2 Power electronics must be designed for the anticipated loads, including overload and short circuit, during all operating and manoeuvring conditions. The overload protection is to be preceded by an optical and acoustic alarm.

9A-4.3 If power electronics are force-cooled, they must, if their cooling system fails, be able to continue operating with reduced power while ensuring, at a minimum, in the case of electric main propulsion, that the craft is capable of making steerageway under its own power. In the event of a failure of the cooling system, an alarm is to be triggered and displayed in the wheelhouse.

9A-4.4 Excitation circuits, the failure of which can endanger safe operation, are only to be protected against short circuits.

9A-5 MONITORING EQUIPMENT

9A-5.1 The operating state of the electric vessel propulsion and its principal components is to be displayed in the wheelhouse and in the propulsion installation.

9A-5.2 If the control system in the wheelhouse fails, the monitoring and operation of the electric main propulsion must be possible from a local control station. The crew must be able to switch within a reasonably short time without having to make changes to the propulsion installation and propeller speed and direction. A system for voice communication with the local control station must be provided to the wheelhouse.

9A-5.3 The operating conditions and operation of the electric vessel propulsion, including the response of the protective device, are to be documented in a non-volatile computer memory such that the fault can be readily analysed in a verifiable manner.

9A-5.4 The electric vessel propulsion system must be equipped with a device for monitoring insulation resistance and with acoustic and optical alarms that are triggered if the insulation resistance lowers.

9A-5.5 When the electric vessel propulsion system is remote-controlled, it must be possible to monitor the execution of the given commands.

9A-6 CONTROL, REGULATION AND AUTOMATIC POWER LIMITATION

9A-6.1 Each station must be provided with signalling to indicate which station is being used for control, and commands must be given only from the active station. The station switch must have a locking mechanism that prevents switching between stations without deactivating the propulsion system.

9A-6.2 To protect the on-board network from being overloaded, provision shall also be made for:

(a) An automatic shutdown of the electrical equipment not relating to personal safety of persons on board or safe navigation and

(b) Where required, additional automatic power limitation of the electric propulsion motors.

9A-6.3 The provisions of paragraph 8-2.3.6 apply mutatis mutandis.

9A-6.4 In the event of individual propulsion units being shut down as a result of an automatic power limitation, the propulsion asymmetry is to be kept to a minimum.

9A-6.5 Loss of the automatic functions of the electric vessel propulsion control system are to trigger an alarm.

9A-7 PROTECTION OF THE ELECTRIC VESSEL PROPULSION SYSTEM

9A-7.1 The automatic switching off of the electric vessel propulsion system, which would affect the manoeuvrability of the craft, must be restricted to malfunctions that would result in significant damage within the propulsion installation.

9A-7.2 Protective devices must be set so that they are not triggered in the event of situations referred to in paragraphs 9A-2.1 and 9A-3.1.

9A-7.3 If a measured or reference value is lost or in the event of a power supply failure of the control or regulation system in accordance with section 9A-6:

(a) The propeller speed must not increase to inadmissible levels;

(b) The propulsion system must not reverse of its own accord;

(c) No other dangerous operating condition must arise.

9A-7.4 If an electric vessel propulsion system can be mechanically locked uncontrollably, it must be equipped with a monitoring device which shall protect the electric vessel propulsion system against damage.

9A-7.5 Each electric propulsion motor is to be fitted with:

(a) Earth fault monitoring;

(b) Differential protection or equivalent protective device and;

(c) Winding temperature monitoring system with an alarm trigger at high winding temperatures.

9A-7.6 The following additional protective devices must be provided:

(a) Overspeed protection;

(b) Protection against overcurrent and short circuit;

(c) Protection against harmful bearing currents (for semiconductor electric motors) by means of steep voltage edges.

9A-7.7 It must be ensured when protective devices are triggered that:

(a) The power is reduced or malfunctioning subsystems are selectively switched off;

(b) Electric vessel propulsion units are shut down in a controlled manner;

(c) The power stored in components and in the load circuit do not have a detrimental impact when they are switched off.

9A-7.8 The triggering of protective, reducing and alarm devices must be displayed optically and acoustically in the wheelhouse and at a suitable position of the craft. The display must be reset only after acknowledgement. An alarm condition must remain visible even after the shutdown.

9A-7.9 The electric vessel propulsion system must have undervoltage protection against unintentional starting after any protective device has been triggered.

9A-8 PROTECTION OF THE ELECTRIC VESSEL PROPULSION SYSTEM

9A-8.1 The test concept envisaged by the manufacturer of the electric vessel propulsion system must be submitted to the inspection body before being put into service for the first time. The latter may demand additional testing and proof confirming the safe operation of the electric vessel propulsion system and its functions. This applies in particular to those instances where the craft is required to be capable of making steerageway under its own power in the event of a malfunctioning propulsion system. The test concept accepted by the inspection body

is deemed to be a manufacturer's instructions according to paragraph 9A-8.2.

9A-8.2 The testing of the electric vessel propulsion system must be carried out by an expert according to the manufacturer's instructions:

(a) Before being put into service for the first time;

(b) Before being put back into service after any major modification or repair;

(c) On every periodical inspection.

An inspection certificate shall be issued, signed by the expert and showing the date of the inspection. The inspection certificate must be permanently kept on board.

9A-9 ELECTRIC AUXILIARY PROPULSION WITH POWER ELECTRONICS

9A-9.1 An electric auxiliary propulsion system with power electronics for speed control must consist of at least a switchgear, an electric propulsion motor and the corresponding power electronics.

9A-9.2 In addition to the provisions pursuant to paragraph 9-2.19 the power electronics of electric auxiliary propulsion system shall comply with the following requirements:

(a) The power electronics components must be protected against exceeding their current and voltage limits;

(b) Semiconductor fuses must be monitored. In the event of a failure of the power electronics, the electric auxiliary propulsion system is to be switched off if necessary in order to avoid consequential damage having regard to the safe operation of the craft;

(c) When the protective devices of power electronics are triggered, the provisions of paragraph 9A-7.7 shall apply mutatis mutandis;

(d) The triggering of protective devices must be indicated by an alarm signal in the wheelhouse and on the protective devices.

V. Chapter 10 "Equipment"

9. Section 10-3, *modify*

10-3 FIREFIGHTING APPLIANCES

A. Portable fire extinguishers

10-3.1 There shall be at least one portable fire extinguisher at each of the following places:

(i) In the wheelhouse;

(ii) Close to each means of access from the deck to the accommodation;

(iii) Close to each means of access to service premises that are not accessible from the accommodation, and which contain heating, cooking or refrigerating equipment using solid or liquid fuels or liquefied gas;

(iv) At each entrance to the engine room and boiler rooms;

(v) At suitable points below deck in engine rooms and boiler rooms such that no position in the space is more than 10 metres walking distance away from an extinguisher.

10-3.2 The extinguishers shall be suitable for their purpose and shall meet the requirements of the Administration or recognized Classification Society. They shall

be inspected and checked at least once every two years. A certificate to that effect, signed by the firm or person that carried out the inspection, shall be kept on board.

10-3.3 For the portable fire extinguishers required by paragraph 10-3.1, only powder type extinguishers with a content of at least 6 kg or other portable extinguishers with the same extinguishing capacity may be used. They shall be suitable for Class A, B and C fires.

By way of derogation on vessels with no liquefied gas installations, spray foam fire extinguishers using aqueous film-forming foam (AFFF) frost proof to –20 °C are permissible even if they are unsuitable for Class C fires. These fire extinguishers shall have a minimum capacity of 9 litres.

In rooms where fires involving vegetable or animal oils and fats are likely to occur, the Administration may require one or more portable fire extinguishers suitable for extinguishing Class F fires. Such portable fire extinguishers shall be entered in item 52 of the ship's certificate.

All extinguishers shall be suitable to extinguish fires in electrical systems of up to 1000 V.

10-3.4 In addition, powder, water or spray foam fire extinguishers may be used which are suitable at least for the class of fire most likely to occur in the room for which they are intended.

10-3.5 The extinguishing substance may neither be halon nor contain a product which is likely to release toxic gases, such as carbon tetrachloride during use. Portable fire extinguishers using CO_2 may only be used to fight fires at specific locations such as electrical installations, kitchens; the quantity of CO_2 shall be no more than 1 kg per 15 m^3 of the room in which they are made available for use.

10-3.6 Extinguishers sensitive to frost or heat shall be installed or protected in such a manner that they are always ready for use.

10-3.7 The extinguishers shall be suitable for their purpose and shall meet the requirements of the Administration or recognized Classification Society. They shall be inspected and checked at least once every two years. A certificate to that effect, signed by the firm or person that carried out the inspection, shall be kept on board.

10-3.8 If the portable fire extinguishers are so installed as to be concealed from view, the plates or doors concealing them shall bear a symbol corresponding to sketch 3 of appendix 3 with a side length of at least 10 cm.

VI. Chapter 12 "Crew Accommodation"

10. Paragraph 12-3.1, *modify*

12-3.1 Doors:

(a) Shall have a total height, coamings included, of at least 1.90 m and a clear width of at least 0.60 m. The prescribed height may be achieved by means of sliding or hinged covers or flaps;

(b) Shall be capable of being opened outwards from either side;

(c) Which are located along escape routes shall not hinder the evacuation of persons when they are opened;

(d) Which are locked from the inside shall be capable of being opened from the outside in an emergency.

Coamings shall be not more than 0.40 m high, but shall nonetheless comply with the provisions of other safety regulations.

VII. Appendix 10 “Supplementary Provisions Applicable to Craft Operating on Fuels with a Flashpoint Equal to or Lower than 55°C”*

11. Section 2.8:

(a) Paragraph 2.8.6, *modify*

2.8.6 The bunkering manifold shall be designed to withstand normal mechanical loads during bunkering. The connections shall be of dry-disconnect type **and** equipped with appropriate additional safety dry break-away couplings.

(b) *Add* a new paragraph 2.8.9

2.8.9 All the components of the bunkering system shall be in accordance with international standard ISO 20519:2017 (5.3 to 5.7).

* ECE/TRANS/SC.3/172/Rev.2/Amend.1.