Annex

Summary of amendments between ES-TRIN 2025/1 and 2027/1

This summary is published for information purposes only. In the event of differences, only the published editions of ESTRIN 2025/1 and 2027/1 (including any corrigenda) are authentic.

Additions and changes are highlighted in grey. Deletions are highlighted in blue.

1. *In the Articles 13.06(5), 28.03(9), 28.04(2)(d), Annex 2, Section B, item 3, Annex 5, Section II, Article 2.07(b), and Section III, Article 2.04(b), ESI-I-1(4), item 43, ESI-II-2 (4.2)(f), ESI-III-9(4), the notes "to the ADN", "of the ADN" or "with ADN" are replaced by "of the Regulations annexed to the ADN", "to the Regulations annexed to the ADN" or "with the Regulations annexed to the ADN".*

2. *The table of contents is amended as follows:*

   a) *The note relating to Article 4.05 (concerns only the French version)*

   b) *The note relating to Article 8.05 is worded as follows:*

   "*Article 8.05 Fuel tanks, pipes and accessories for liquid fuels having a flashpoint of more than 55 °C"*

   c) *The note relating to Article 10.20 is worded as follows:*

   "*Article 10.20 ~~Test conditions for electronic installations~~*(LEFT VOID)"

   d) *The note relating to Chapter 12 is worded as follows:*

   "CHAPTER 12 ELECTRONIC EQUIPMENT, ~~AND~~ SYSTEMS AND NETWORKS
   Article 12.00 Definitions
   Article 12.01 General provisions
   Article 12.02 Electronic networks
   Article 12.03 Documentation
   Article 12.04 Maintenance and checks
   Article 12.05 Software design and updates
   Article 12.06 Environmental and power supply requirements
   Article 12.07 Electromagnetic compatibility
   Article 12.08 Human – Machine Interface (HMI)
   Article 12.09 Failure or malfunction
   Article 12.10 Control, monitoring and safety systems
   Article 12.11 Back-up power supply"

e) The note relating to Chapter 32 is worded as follows:

"CHAPTER 32 TRANSITIONAL PROVISIONS FOR CRAFT ~~NAVIGATING ON THE RHINE (ZONE R)~~WHICH ARE ALREADY IN SERVICE

Article 32.01 Applicability of transitional provisions to craft which are already in service
Article 32.02 Reference to European or international standards
Article 32.03 Ship's boats on board craft which are already in service
~~*Article 32.04 Other transitional provisions*~~
~~*Article 32.05 Transitional provisions for craft not covered by Article 32.01*~~
~~*Article 32.06 Ship's boats which were on board craft before 1.10.2003*~~"

f) The notes relating to Chapter 33 are deleted.

g) The note relating to Annex 3, Section III (concerns only the Dutch version)

h) The notes relating to Annex 5 are worded as follows:

"ANNEX 5 NAVIGATION, ~~AND~~ INFORMATION AND SPECIAL EQUIPMENT

Section I Definitions and procedural provisions for navigation, information and special equipment
Section II Navigational radar installations
Section III Rate-of-turn indicators
Section IV Inland AIS equipment
Section V Tachographs
Section VI Track Guidance Assistants for Inland Navigation (TGAIN)
Section VII Awareness monitoring systems
Section VIII Rate-of-turn regulators connected to a TGAIN

i) The note relating to ESI-II-13 is worded as follows:

"ESI-II-13 MODEL FOR A LIMITED GENERAL PLAN OF THE ELECTRICAL INSTALLATION FOR CRAFT WHICH WERE LAID DOWN ON OR BEFORE 1 APRIL 19~~76~~83"

3. *Article 1.01 is amended as follows:*

a) *(3.21) is worded as follows:*

"3.21 'explosive atmosphere': ~~a~~ mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour~~,~~ or dust~~, fibres, or flyings~~, which, after ignition, permits self-sustaining ~~flame~~ propagation;".

b) *After (3.21), the following (3.22) is inserted:*

"3.22 'explosive gas atmosphere': mixture with air, under atmospheric conditions, of flammable substances in the form of gas or vapour, which, after ignition, permits self-sustaining flame propagation;".

c) *The current (3.22) becomes (3.23) and is worded as follows:*

"3.2~~2~~3 'hazardous area': ~~an~~ area in which an explosive ~~gas~~ atmosphere is present or ~~may~~can be expected to be present, in quantities such ~~as to require~~that special precautions for the construction, installation and use of equipment are required.

For the purpose of this Standard, an area is a three-dimensional region or space;".

d) *After (3.23), the following (3.24) is inserted:*

"3.24 'non-hazardous area': area in which an explosive atmosphere is not expected to be present in quantities such that special precautions for the construction, installation and use of equipment are required.

For the purpose of this Standard, an area is a three-dimensional region or space;".

e) *The current (3.23) becomes (3.25) and is worded as follows:*

"3.2~~3~~5 'zone~~s~~': hazardous area classification based ~~up~~on the frequency of the occurrence and duration of ~~an~~ the explosive atmosphere;

~~'Zone 0': areas in which an explosive atmosphere is present continuously or for long periods or frequently.~~

~~'Zone 1': areas in which an explosive atmosphere is likely to occur in normal operation occasionally.~~

~~'Zone 2': areas in which an explosive atmosphere is not likely to occur in normal operation but, if it does occur, will persist for a short period only. These areas also include areas directly adjoining Zone 1 that are not separated from one another in a gas tight manner.~~".

f) After (3.25), the following (3.26), (3.27) and (3.28) are inserted:

"3.26 'Zone 0': area in which an explosive gas atmosphere is present continuously, or for long periods, or frequently;

3.27 'Zone 1': area in which an explosive gas atmosphere is likely to occur occasionally in normal operation;

3.28 'Zone 2': area in which an explosive gas atmosphere is not likely to occur in normal operation but if it does occur, will persist for a short period only;"

g) The current (3.24) becomes (3.29) and is worded as follows:

"3.249 'certified safe type electrical equipment': an electrical equipment which has been tested and approved by the competent authority regarding its safety of operation in an explosive atmosphere;".

h) After (4.29), the following (4.30) is inserted:

"4.30 Propulsor': the part of the propulsion system that propels a vessel by hydrodynamic action, e.g. a propeller or other mechanical device with a comparable propulsive effect;".

i) (5.10) is worded as follows:

"5.10 'rate-of-turn regulator': equipment which automatically produces and maintains a given rate of turn of the vessel in accordance with its setpoints~~preselected values~~;".

j) (7.9) is worded as follows:

"7.9 'ES-RIS': the European Standard for River Information Services (ES-RIS 2025~~5~~7/1)[1];".

k) After (7.9), the following (7.10) and (7.11) are inserted:

"7.10 "Track Guidance Assistant for Inland Navigation (TGAIN)": navigation equipment fitted aboard a vessel for steering the vessel automatically along a track to follow. This equipment indirectly commands the steering apparatus to change the rudder angle (vessel's heading) and possibly the propulsion system (vessel's speed);

7.11 "Awareness monitoring system": system intended to monitor the activity at the steering position and detect any disability of the person at helm, which could lead to accidents;".

[1] CESNI Resolution 2024~~6~~-II-~~2~~xx dated ~~17~~xx October 2024~~6~~.

l) (10.2), second indent, is worded as follows:

"- the propulsion machinery as well as the auxiliary engines, the mechanical and electrical equipment, required for shipboard services, have been manufactured and tested in accordance with the recognised classification society's rules and have been installed under its supervision; the unit as a whole will have successfully undergone post installation testing."

m) (11.3) and (11.4) (concerns only the Dutch version)

n) (12.3) and (12.4) are worded as follows:

"12.3 'ADN': the ~~Regulations annexed to The~~ European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways ~~(ADN)~~ in its current version;

12.4 'inland navigation vessel certificate': Union certificate for inland navigation vessels or Rhine vessel inspection certificate, issued by the competent authority and which confirms compliance with the technical requirements~~.~~;".

o) After (12.4), the following (12.5) is inserted:

"12.5 'ADR': the European Agreement concerning the International Carriage of dangerous Goods by Road in its current version."

4. Article 3.02 is amended as follows:

a) (1)(b) is worded as follows:

"b) In the event of periodical inspection, the minimum thickness of the bottom, bilge and side plates of vessels made from steel shall be no less than the higher of the values resulting from the following formulae:

1. for vessels that are longer than 40 m: $t_{min} = f \cdot b \cdot c\,(2{,}3 + 0{,}04\,L)[mm]$;
   for vessels not more than 40 m in length: $t_{min} = f \cdot b \cdot c\,(1{,}5 + 0{,}06\,L)[mm]$, however, not less than 3,00 mm.

2. $t_{min} = 0{,}005 \cdot a\,\sqrt{T}\ [mm]$.

where:

a = frame spacing (mm);

f = frame spacing factor
$f = 1$ for $a \leq 500\,mm$,
$f = 1 + 0{,}0013\,(a - 500)$ for $a > 500\,mm$;

b = factor for bottom, side or bilge plates
$b = 1{,}0$ for bottom plates and side plates,
$b = 1{,}25$ for bilge plates.

$f = 1$ may be taken for the frame spacing when calculating the minimum thickness of the ~~side~~ bilge plates. However, the minimum thickness of the bilge plates may in no case be less than that of the bottom plates and side plates.

c = factor for the type of structure:
$c = 0{,}95$ for vessels with double bottom and double side with the hold's boundary located vertically in line with the coaming,
$c = 1{,}0$ for all other types of structure."

b) (2) is worded as follows:

"2. Where a material other than steel is used for the construction of the hull, it shall be proved by calculation that the hull strength (longitudinal, lateral and local strength) equals at least the strength that would result from the use of steel under the assumption of minimum thickness in accordance with (1). If a ~~certificate of class~~classification certificate or a declaration issued by a recognised classification society is presented, a proof by calculation may be dispensed with."

5. Article 3.03 is amended as follows:

a) (1), 1st sentence, is worded as follows:

"Watertight Bbulkheads rising up to the deck or, where there is no deck, up to the gunwale, shall be installed at the following points:"

b) (2), 1st sentence (concerns only the French version)

6. Article 4.05, title (concerns only the French version)

7. *Article 6.02(2) is worded as follows:*

"2. If the second drive unit or manual drive is not placed in service automatically, it shall be possible to do so immediately by means of a single operation by the ~~helmsman~~ person at helm that is both simple and quick."

8. *Article 6.03(5) is worded as follows:*

"5. Hydraulic cylinders, hydraulic pumps and hydraulic motors as well as electric engines ~~motors~~ shall be examined at the latest every eight years by a specialised firm and repaired if required."

9. *Article 6.08 is amended as follows:*

a) *(1) is worded as follows:*

"1. Rate-of-turn regulators and their components shall meet the requirements laid down in Article 12.06~~10.20~~."

b) *(4) (concerns only the Dutch version)*

c) *(5) is worded as follows:*

"5. The gyroscopes, detectors and rate-of-turn indicators used in the rate-of-turn regulators shall meet the minimum requirements ~~of the minimum specifications and test conditions concerning rate-of-turn displays for inland waterways, as~~ laid down in Section III of Annex 5.

d) *After (5), the following (6) is added as follows:*

"6. Rate-of-turn regulators that are connected to a TGAIN shall fulfil the requirements laid down in Annex 5. Compliance with these requirements shall be determined by a type-approval issued by the competent authority."

10. *Article 6.09(1)(f) (concerns only the Dutch version)*

11. *Article 6.09(2) is worded as follows:*

"2. Operation of the entire steering system shall be checked by means of a navigation test. If a rate-of-turn regulator is installed it shall be checked that a predetermined course can be reliably maintained and that bends can be negotiated safely. If a TGAIN is installed, it shall be checked that a track to follow can be reliably maintained and that bends can be negotiated safely."

12. *Article 6.09(4) is amended as follows:*

a) *(c) (concerns only the French version)*

b) *(d) is worded as follows:*

"d) a visual check of the electrical components, in particular relays, electric engines ~~motors~~ and safety devices;"

13. *Article 7.01(1) is worded as follows:*

"1. Wheelhouses shall be arranged in such a way that the ~~helmsman~~ person at helm may at all times perform his task while the vessel is under way."

14. Article 7.02 is amended as follows:

a) (2), 1st sentence, is worded as follows:

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

b) (3) is worded as follows:

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

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

Even in the case where a field of unobstructed vision of at least 240° of the horizon is provided, the inspection body may require other measures and in particular the installation of appropriate auxiliary means if no sufficiently unobstructed view is provided towards the rear.

The lower edge of the side windows must be located as low as possible and the upper edge of the side and rear windows must be located as high as possible.

In determining whether the requirements in this Article for visibility from the wheelhouse are met, the ~~helmsman~~person at helm shall be assumed to have a height of eye of 1,65 m above the wheelhouse floor at the steering position."

15. Article 7.04 is amended as follows:

a) (5) is worded as follows:

"5. Vessels with steering positions designed for radar navigation by one person shall be steered by means of a steering lever. It shall be possible to move that lever easily by hand. The position of the steering lever in relation to the longitudinal axis of the vessel shall correspond precisely to the position of the rudder blades. It shall be possible to release hold of the steering lever in any given position without that of the rudder blades changing. The neutral position of the steering lever shall be clearly perceptible."

b) (6) (concerns only the German version)

c) (7) is worded as follows:

"7. Where rate-of-turn regulators are used, it shall be possible for the ~~rate-of-turn control~~steering lever to be released in any given position without altering the rate-of-turn ~~speed~~ selected.

The steering lever~~control~~ shall turn through a wide enough arc to guarantee adequately precise positioning. The neutral position shall be clearly perceptible from the other positions. ~~The scale must be continuously adjustable for illumination.~~"

16. *Article 7.04(9), alinea 2, is amended as follows:*

a) *The first sentence is worded as follows:*

"The requirements set out in (1) to (8) shall apply, mutatis mutandis, in view of the specific characteristics and arrangements selected for the abovementioned active steering and propulsion ~~units~~ systems."

b) *The second sentence is worded as follows:*

"In analogy to (2), each ~~unit~~ system shall be controlled by a lever which moves in the form of an arc within a vertical plane that is approximately parallel to the direction of the thrust of the ~~unit~~ system."

c) *The last sentence is worded as follows:*

"From the position of the lever the direction of the thrust acting on the vessel shall be clear."

17. *Article 7.04(10)(g) is amended as follows:*

"g) the level of ~~available fuel in fuel tanks (filling level) or~~ energy in accumulator sets (state of charge) supplying propulsion engines."

18. *Article 7.06 is amended as follows:*

a) *(1) (concerns only the Dutch version)*

b) *(4) is worded as follows:*

"4. The rate-of-turn indicator shall be located ahead of the ~~helmsman~~person at helm and within his field of vision."

c) *(5)(a) is worded as follows:*

"a) the radar screen shall not be shifted significantly out of the ~~helmsman~~person at helm's axis of view in its normal position;"

d) *After (5), the following (6) and (7) are added as follows:*

"6. TGAIN shall fulfil the requirements laid down in Annex 5. Compliance with these requirements shall be determined by a type-approval issued by the competent authority.

7. Awareness monitoring systems shall fulfil the requirements laid down in Annex 5. The awareness monitoring system is either a standalone system or a functionality integrated into other systems, such as TGAIN. Compliance with these requirements shall be determined by a type-approval issued by the competent authority."

19. *Article 7.07(2) is worded as follows:*

"2. Where vessel steering positions designed for radar navigation by one person are equipped with a radio telephone system for the public correspondence network, reception shall be possible from the ~~helmsman~~person at helm's seat."

20. Article 7.09(2) is worded as follows:

"2. The ~~helmsman~~person at helm shall have within reach an on/off switch controlling the alarm signal; switches which automatically return to the off position when released are not acceptable."

21. Article 7.11 is worded as follows:

"Article 7.11
Stern-anchor operating equipment

On board vessels and convoys whose steering position has been designed for radar navigation by one person and exceeding 86 m in length or 22,90 m in breadth it shall be possible for the ~~helmsman~~person at helm to drop the stern anchors from his position."

22. Article 7.14(8), 1st sentence (concerns only the Dutch version)

23. Article 8.01(3) (concerns only the Dutch version)

24. Article 8.05, title, is worded as follows:

"Article 8.05
Fuel tanks, pipes and accessories for liquid fuels having a flashpoint of more than 55 °C"

25. Article 8.08(2) 2nd sentence is worded as follows:

"However, for vessels with a power of less than 225 kW or with a deadweight of less than 350 t, or where vessels not intended for the carriage of goods have a water displacement of less than 250 m^3, one pump will suffice which can be either manually-operated or motor-driven."

26. Article 9.05(3) (concerns only the Dutch version)

27. Article 10.01(2) is worded as follows:

"2. The following documents bearing the stamp of the inspection body shall be available on board:

a) general plans concerning the entire electrical installation;

b) plans of the main switchboards, the emergency switchboards, the distribution switchboards, showing the most important technical data such as amperage of the nominal current of fuses and switching devices;

c) indications of power requirements for electrical service equipment;

d) types of cables indicating conductor cross-sections;

e) for electric propulsion systems, a process and instrumentation diagram (PID) of these systems, switchboard plans, arrangement plans of electric service rooms including the location of main components as well as documentation for electric propulsion engines and other main components;

f) plans of electronic steering control, regulating, alarm and safety systems;

g) control circuit plans;~~.~~

h) for propulsion and auxiliary systems with lithium-ion accumulators with a cumulative capacity above 20 kWh, the accumulator operating manual. It contains:

aa) explanations about the operation of the accumulator system, charging of the accumulators, watch keeping and

bb) instructions on how to detect and manage thermal runaways.

For craft for which a safety rota is mandatory in accordance with Articles 19.13 or 30.05, the instructions referred to in (bb) shall be integrated in this safety rota.

For unmanned craft, these documents shall not be required to be on board but shall at all times be available with the owner."

28. Article 10.04(1) to (4) is worded as follows:

"1. Only certified safe type electrical equipment ~~that has been explosion proofed (certified safety)~~ may be installed in rooms or areas where explosive atmosphere is likely to accumulate. This equipment must be tested and approved as to its operating safety in an explosive atmosphere by testing institution recognised on the basis of national provisions of one of the Member States.

The installation in these rooms or areas of switching devices for lighting appliances and other electrical equipment is to be avoided as far as possible. The explosion proofing shall take account of the characteristics of the atmosphere that is likely to arise (explosion-potential group, temperature class) and of the requirements of the relevant zone.

Information and restrictions in the approval certificates of the equipment must be observed.

The classification and evaluation of hazardous areas ~~at risk of explosion~~ is to be conducted and documented in accordance with International Standards EN 60079-10-1 : 2020 and EN 60079-10-2 : 2015.

2. The applicable rules for hazardous areas:

   a) In Zone 0 areas only intrinsically safe circuits (protection class Ex ia) in accordance with International Standard IEC 60079-11 : 2012 are permitted.

   b) In Zzone 1 areas only ~~explosion-protected~~ certified safe type electrical equipment ~~(certified safety)~~ is permitted.

   c) In Zzone 2 areas measures need to be taken to protect electrical equipment that are appropriate to the type and intended purpose of the service equipment.
   Approval in these areas is restricted to:

      aa) ~~explosion-protected~~ certified safe type electrical equipment ~~(certified safety)~~ or

      bb) service equipment, which in normal use do not produce any sparks and whose surfaces might come into contact with the outside air, do not reach impermissible temperatures, or

      cc) service equipment which is protected by pressurizsation or which is encapsulated in a vapour-proof manner (minimum protection class IP 55) and whose surfaces do not reach impermissible temperatures.

3. For dust explosion protection, the requirements shall apply according to European Standard EN 60079-10-2 : 2015.

4. Hazardous areas shall bear on the outside a symbol for “Warning for areas where explosive atmospheres may occur” in accordance with Figure 13 of Annex 4, with a side length of at least 10 cm.”

29. Article 10.11(17), last paragraph (concerns only the Dutch version)

30. Article 10.13 (concerns only the Dutch version)

31. Article 10.16(3) second sentence is worded as follows:

“This requirement shall also apply to rooms where cooling machinery, hydraulic machinery or electric engines ~~motors~~ are installed.”

32. *Articles 10.20 and 10.21 are worded as follows:*

"Article 10.20
(left void)"
~~Test conditions for electronic installations~~

~~1. General~~

~~The test conditions in (2) shall apply only to electronic equipment that are necessary for the steering system and the craft's propulsion machinery, including their ancillaries.~~

~~2. Test conditions~~

~~a) The stresses arising from the following tests shall not cause electronic equipment to be damaged or to malfunction. The tests in accordance with relevant International Standards, such as IEC 60092-504 : 2016, apart from the cold-condition test, shall be carried out with the equipment switched on. These tests shall include checking of proper operation.~~

~~b) Variations in voltage and frequency~~

	~~Parameters~~	~~Variations~~	
		~~continuous~~	~~Short-duration~~
~~General~~	~~Frequency~~ ~~voltage~~	~~± 5 %~~ ~~± 10 %~~	~~± 10 % 5 s~~ ~~± 20 % 1,5 s~~
~~Battery operation~~	~~voltage~~	~~+ 30 % / - 25 %~~	~~-~~

~~c) Heating test~~

~~The sample is brought up to a temperature of 55 °C within a half-hour period. After that temperature has been reached it is maintained for 16 hours. An operating test is then carried out.~~

~~d) Cold-condition test~~

~~The sample is switched off and cooled to -25 °C and held at that temperature for two hours. The temperature is then raised to 0 °C and an operating test is carried out.~~

~~e) Vibration test~~

~~The vibration test shall be carried out along the three axes at the resonance frequency of the equipment or of components for the period of 90 minutes in each case. If no clear resonance emerges the vibration test shall be carried out at 30 Hz.~~

~~The vibration test shall be carried out by sinusoidal oscillation within the following limits:~~
~~General:~~
~~f = 2,0 to 13,2 Hz; a = ± 1 mm~~
~~(amplitude a = 1/2 the vibration width)~~
~~f = 13,2 Hz to 100 Hz: acceleration ± 0,7 g.~~
~~Service equipment intended to be fitted to internal combustion engines or steering apparatus shall be tested as follows:~~
~~f = 2,0 to 25 Hz; a = ± 1,6 mm~~
~~(amplitude a = 1/2 the vibration width)~~
~~f = 25 Hz to 100 Hz; acceleration ± 4 g.~~
~~The sensors intended to be installed in internal combustion engine exhaust pipes may be exposed to considerably higher stresses. Account shall be taken of this during the tests.~~

~~3. The electromagnetic compatibility test shall be carried out on the basis of European Standards EN 61000-4-2 : 2009, EN 61000-4-3 : 2020, EN 61000-4-4 : 2012, at test degree number 3.~~

~~4. Proof that the electronic equipment is adequate for these test conditions shall be provided by their manufacturer. A certificate by a recognised classification society is also considered as a proof.~~

Article 10.21
Electromagnetic compatibility

Article 12.07(4) and (5) also applies to electrical equipment which is not electronic equipment."
~~The operation of the electric and electronic installations shall not be impaired by electromagnetic interference. General measures shall, with equal importance, extend to:~~

~~a) disconnection of the transmission paths between the source of interference and affected equipment;~~

~~b) reducing the causes of disturbance at their source;~~

~~c) reducing the sensitivity of affected equipment to interference.~~"

33. Article 11.02(2) is worded as follows:

"2. The ~~fuel~~ regulators of the internal combustion engines for generators of electric propulsion systems shall ensure safe operation over the entire speed and load range and for all sailing and manoeuvring conditions in single and parallel operation. This provision shall apply *mutatis mutandis* to ~~fuel~~ regulators of fuel cells."

34. Article 11.04(1) is worded as follows:

"1. The power electronics requirements according to Articles 10.18 and 12.06~~10.20~~ shall apply with the following provisions."

35. Article 11.08(2) is worded as follows:

"2. The test concept shall cover at least:

a) navigation under utilisation of electric propulsion systems at full power and normal operation of all other consumer equipment on board;

b) navigation under utilisation of electric propulsion systems at normal operation with reduced load factor of power sources with testing of switching on and off of the different power sources;

c) testing of the electric propulsion systems during navigation

aa) in the event of failure of a power source as well as undersupply of the electric propulsion systems (worst-case scenario);

bb) in case of failure of external cooling of power electronics or propulsion engines;

cc) in case of failure of control and regulation systems of the electric propulsion systems, and

dd) during a stopping manoeuvre (independent of the length of the vessel),

d) where appropriate, testing of independence of electric propulsion systems during navigation

aa) in the event of failure of one element of one of the electric propulsion systems.

In addition, it has to be demonstrated that in the event of one of the failures as referred to under (c) the vessel is capable of making steerageway under its power.

The test concept shall include information regarding the power management during load variations for the situations described under a) to d), including the corresponding reaction timing of the electric propulsion system and the power sources involved, in order to assess compliance with the requirements of Articles 11.02 and 11.06.

The inspection body may require additional tests or documentation."

36. Chapter 12 is worded as follows:

"CHAPTER 12
ELECTRONIC EQUIPMENT, ~~AND~~ SYSTEMS AND NETWORKS

Article 12.00
Definitions

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

1. 'electronic equipment': an individual electronic device or assembly that employ electrical or electronic components, including possible software, to perform a specific function. This includes communication, navigation, monitoring, control, and safety systems;

2. 'electronic system': multiple electronic equipment which performs a specific function or set of functions;

3. 'electronic network': a set of electronic equipment or systems with digital interfaces that are connected, in which each electronic equipment or system can interchange data with any other electronic equipment or system in the network;

4. 'category I equipment, network or system': electronic equipment, electronic network or electronic system intended for operation of the vessel;

5. 'category II equipment, network or system': electronic equipment, electronic network or electronic system not being category I equipment, network or system;

6. 'equipment under control': equipment of the vessel, which is controlled by an electronic equipment or system;

7. 'Human – Machine Interface (HMI)': the part of an electronic system or equipment that enables the crew or shipboard personnel to operate the electronic system or equipment;

8. 'control system': a designated electronic system that enables control of the equipment for which the control system is foreseen. A control system comprises power supply and associated controls;

9. 'monitoring system': a designated electronic system that permanently displays the functioning of equipment and alert the crew or shipboard personnel to malfunctions, abnormal conditions and critical situations of the equipment under control requiring attention or action. A monitoring system comprises sensors;

10. 'safety system': a designated independent electronic system necessary to achieve or maintain a safe state for the equipment under control. A safety system comprises sensors and hardware devices;

11. 'manufacturer': any natural person or legal person who places electronic equipment, systems or networks, including possible software, on the market, whether or not the person is directly involved in all stages of the design and construction of the electronic equipment, systems, or networks.

Article 12.01
General provisions

1. This chapter applies to all electronic equipment, electronic systems and electronic networks which fall in category I and are permanently installed on board. The electronic equipment or electronic systems are considered as category I when they are connected to electronic equipment, electronic systems and electronic networks falling in category I. However, electronic equipment, electronic systems and electronic networks which fall in category II shall not jeopardize the proper functioning of category I equipment, systems or networks.

2. This chapter does not apply to electronic equipment already covered by specific type-approval procedures in accordance with this Standard or Regulation (EU) 2016/1628.

3. Taking into account normal and emergency operations, electronic equipment and systems shall be suitable for their intended use within the operational limitations stipulated by the manufacturer.

4. Electronic equipment, systems and networks shall be installed in accordance with the manufacturer's installation requirements.

Article 12.02
Electronic networks

1. Electronic networks shall be designed such that they
   a) transfer data properly,
   b) are reliable and
   c) are suitable for their intended use.

2. Category I electronic networks shall be physically segregated from category II electronic networks

3. The design of electronic networks, including protocols and interfaces, shall comply with one of the following letters:
   a) the applicable standards of the IEEE 802 family;
   b) the following International or European Standards, applicable for the selected network type:

IEC	ISO	Others
IEC 61158 : 2019	ISO 11898-1 : 2024	ANSI/TIA/EIA-485-A-1998
IEC 61784-1 : 2023	ISO 11898-2 : 2024	EN 50325-1 : 2019
IEC 61784-2 : 2019	ISO 11898-3 : 2006	EN 50325-4 : 2003
IEC 61784-3 : 2021	ISO 11898-4 : 2004	
IEC 61162-1 : 2024		
IEC 61162-2 : 2024		
IEC 61162-3 : 2008	ISO 16845-1 : 2016	
IEC 61162-450 : 2024	ISO 16845-2 : 2018	
IEC 61162-460 : 2024		

   or
   c) an equivalent Standard recognised by one of the Member States.

4. Protocols and interfaces used in electronic networks shall include at least a data integrity protocol.

5. External connections to onboard electronic network are permitted, provided that:
   a) these connections rely on a Virtual Private Network (VPN) or other security measures offering equivalent robust services and encryption;
   b) these connections are designed to allow a manual release by the boatmaster or after a time window predefined by the boatmaster;
   c) an interruption of external connections does not impede the operation of the vessel.

6. Wireless connections shall be protected against unauthorised access by mean of access control. Electronic equipment, systems and networks shall comply with high security standards for wireless connection.

Article 12.03
Documentation

1. Electronic equipment, systems and networks shall be provided with documentation by the manufacturer. It shall include at a minimum:
   a) a description of electronic equipment components, based on a block diagram of the overall system, showing all connections between electronic equipment, systems, networks and external service providers;
   b) a functional description of the normal operation and a description of potential failures;
   c) a description of operational limitations;
   d) requirements for installation and power supply;
   e) provisions for maintenance and modifications which the crew is permitted to perform;
   f) a description of error/warning messages and troubleshooting;
   g) instructions for software updates (including how to check for original manufacturer's updates);
   h) an explanation of the access restrictions for connectivity (physical or wireless);
   i) a description of operational parameters and settings that can be configured via the HMIs after the installation on board;
   j) an instruction on how to reboot without impeding the operation of the vessel.

2. A list of all electronic equipment, systems and networks permanently installed, mentioning the location on board and software version, shall be provided
   a) before being put into service for the first time; and
   b) before being put back into service after any modification or repair.

3. Paper or electronic copies of the documentation referred to in this Article shall be kept on board.

Article 12.04
Maintenance and checks

1. Electronic equipment, systems and networks shall be maintained and their software updated according to the documentation referred to in Article 12.03(1).

2. Checks of electronic equipment, systems and networks shall be carried out in accordance with the documentation referred to in Article 12.03(2):
   a) before being put into service for the first time; and
   b) before being put back into service after any modification or repair.

3. The checks referred to in (2) shall, where appropriate, cover at least:
   a) a visual check of integrity and conformity of the electronic equipment and electronic systems;
   b) a visual check, whether software updates are installed and documented;
   c) a verification of listed electronic equipment, systems and networks in accordance with Article 12.03(2), in particular the running software versions;
   d) a verification of the proper functioning of the control, monitoring, alarm and safety systems.

   An inspection attestation shall be issued by a competent person, showing the date of the inspection. The inspection attestation must be permanently kept on board.

4. Electronic systems shall be provided with a testing concept with different scenarios representing
   a) normal and emergency operating conditions including failure or malfunction of electronic equipment, systems or networks referred to in Article 12.09, and
   b) acceptance criteria including demonstration of independency between redundant electronic equipment, system or network.

   When undertaking checks referred to in (2), the inspection body can require functional tests according to the testing concept.

Article 12.05
Software design and updates

1. Software of electronic equipment shall be developed, documented, installed and updated in accordance with good practices principles. This requirement is deemed fulfilled when the documentation of electronic equipment includes a declaration of conformity from the manufacturer with reference to recognised Standards, such as the International Standards ISO 17894 : 2005 or ISO/IEC 12207 : 2017.

2. Updates of software of electronic equipment shall not impede the operation of the vessel.

3. Unless otherwise specified in this Standard, the software of electronic equipment shall be maintained in a way that the equipment performs all the functions required by this Standard, regardless of the date on which the equipment is placed on board and possible evolution of the normative framework

4. Electronic equipment, systems and networks shall be designed in such a way that:

   a) the software version can be easily read (e.g. on screen) by the crew and the inspection body;

   b) software updates are recorded in a non-volatile computer memory;

   c) software updates can be implemented without delays but without impeding vessel operation;

   d) it shall be possible to revert to the last stable software version after a software update.

Article 12.06
Environmental and power supply requirements

1. Electronic equipment and systems shall be designed to

   a) operate satisfactorily within the expected environmental and power supply conditions, and

   b) resume normal operation after an interruption of the power supply without requiring manual actions.

2. Tests shall be carried out by the manufacturer, or an accredited test institution complying with the European Standard EN 17025 : 2017, to prove that the requirements stipulated in (1) are fulfilled. The tests shall include at least the following:

   a) high voltage;

   b) power supply variations;

   c) insulation resistance;

   d) cold with gradual change of temperature;

   e) dry heat with gradual change of temperature;

   f) vibration.

   Proof that the electronic equipment and systems are adequate for these test conditions shall be provided by their manufacturer. A certificate by a recognised classification society is also considered as a proof.

3. Requirements regarding high voltage are deemed fulfilled when the equipment successfully passes the test laid down in the European Standard EN 60092-504 : 2016, Part 5, Table 1, item 3.

4. Requirements regarding power supply variations are deemed fulfilled

a) when the equipment successfully passes the following test conditions,

	Parameters	Variations	
		Continuous	Short duration
General	Frequency Voltage	±5 % ±10 %	±10 % 5 s ±20 % 1,5 s
Battery operation	Voltage	+30 % / -25 %	-

or

b) when the equipment successfully passes the test laid down in the European Standard EN 60092-504 : 2016, Part 5, Table 1, item 4a.

5. Requirements regarding insulation resistance are deemed fulfilled when the equipment successfully passes the test laid down in the European Standard EN 60092-504 : 2016, Part 5, Table 1, item 5.

6. Requirements regarding cold with gradual change of temperature are deemed fulfilled:

a) when the equipment successfully passes the following test conditions:

aa) The equipment is switched off and cooled to -25 °C and held at that temperature for two hours and

bb) The temperature is then raised to 0 °C; or

b) when the equipment successfully passes the test laid down in the European Standard EN 60092-504 : 2016, Part 5, Table 1, item 6.

7. Requirements regarding dry heat with gradual change of temperature are deemed fulfilled:

a) when the equipment successfully passes the following test conditions:

The equipment is brought up to a temperature of 55 °C within a half-hour period and held at that temperature for 16 hours; or

b) when the equipment successfully passes the test laid down in the European Standard EN 60092-504 : 2016, Part 5, Table 1, item 7.

8. Requirements regarding vibration are deemed fulfilled:

a) when the equipment successfully passes the following test conditions:

The vibration test shall be carried out along the three axes at the resonance frequency of the equipment or of components for the period of 90 minutes in each direction of the axes. If no clear resonance emerges the vibration test shall be carried out at 30 Hz.

The vibration test shall be carried out by sinusoidal oscillation within the following limits:

f = 2,0 to 13,2 Hz; a = ±1 mm, and amplitude a = 1/2 the vibration width

f = 13,2 Hz to 100 Hz: acceleration ±0,7 g.

Components intended to be fitted to internal combustion engines or steering apparatus shall be tested as follows:

f = 2,0 to 25 Hz; a = ±1,6 mm, and amplitude a = 1/2 the vibration width

f = 25 Hz to 100 Hz; acceleration ±4 g.

The sensors intended to be permanently installed in internal combustion engine exhaust pipes may be exposed to considerably higher stresses. Account shall be taken of this during the tests; or

b) when the equipment successfully passes the test laid down in European Standard EN 60092-504 : 2016, Part 5, Table 1, item 10.

9. The following table specifies the performance criteria that electronic equipment shall fulfil during and after the tests.

Test	Category I
High voltage	B
Power supply variation	A
Insulation resistance	B
Cold with gradual change of temperature	A
Dry heat with gradual change of temperature	A
Vibration	A

According to the International Standard IEC 60533 : 2015 for vessels with metallic hull, the performance criteria are defined as follows:

“Performance criterion A” means the equipment under test shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed as defined in the technical specification provided by the manufacturer.

“Performance criterion B” means the equipment under test shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed as defined in the technical specification provided by the manufacturer. During the test, degradation or loss of function or performance, which is self-recoverable is allowed but no change of actual operating state or stored data is allowed.

For vessels with non-metallic hull the International Standard IEC 62742 : 2021 applies.

10. For navigation and radiocommunication equipment, the requirements laid down in (3), (4), (5), (6), (7) and (8) are deemed fulfilled when the equipment successfully passes the test laid down in International Standard IEC 60945 : 2002.

Article 12.07
Electromagnetic compatibility

1. Electronic equipment and systems shall be designed and manufactured in such a way as to ensure that:
   a) the electromagnetic disturbance generated does not exceed the level above which radio and telecommunications equipment or other equipment cannot operate as intended;
   b) it has a level of immunity to the electromagnetic disturbance to be expected in its intended use which allows it to operate without unacceptable degradation of its intended use.

2. Tests shall be carried out by the manufacturer, or an accredited test institution complying with the European Standard EN 17025 : 2017, to prove that the requirements stipulated in (1) are fulfilled.

   Proof that the electronic equipment and systems are adequate for these test conditions shall be provided by their manufacturer. A certificate by a recognised classification society is also considered as a proof.

3. Requirements regarding immunity are deemed fulfilled when
   a) the equipment successfully passes the following test conditions:
      aa) electrostatic discharge immunity in accordance with the European Standard EN 61000-4-2 : 2025;
      bb) immunity to radiated, radiofrequency and electromagnetic fields in accordance with the European Standard EN 61000-4-3 : 2020;
      cc) immunity for electrical fast transient/burst, at test degree number 3 in accordance with the European Standard EN 61000-4-4 : 2012;
      dd) conducted radio interference immunity in accordance with the European Standard EN 61000-4-6 : 2023;
      ee) conducted low frequency immunity in accordance with the European Standard EN 61000-4-16 : 2015 and
      ff) radiated radio frequency field immunity in accordance with the European Standard EN 61000-4-39 : 2017;

   or

   b) when the equipment complies with Directive 2014/30/EU or equivalent standard recognised by one of the Member States.

4. In accordance with Article 12.01(1) second sentence, all electronic equipment and systems permanently installed on board shall be able to function satisfactorily in their electromagnetic environment without introducing unacceptable electromagnetic disturbances to other equipment and systems in that environment.

5. The inspection body can require additional mitigating measures such as:
   a) disconnecting the transmission paths between the source of disturbance and affected equipment;
   b) reducing the causes of disturbance at their source;
   c) reducing the sensitivity of affected equipment to disturbance.

Article 12.08
Human – Machine Interface (HMI)

1. HMIs shall be ergonomically designed in order to
   a) ensure simple and safe operation of the equipment;
   b) facilitate the proper use by the crew and shipboard personnel;
   c) allow timely and individually targeted actions;
   d) reduce the probability of inadvertent operation; and
   e) ensure freedom from glare on displays.

2. When a single display is used for several functions, a failure in the display shall not lead to the loss of interface with equipment, system or network functions. This requirement is deemed to be fulfilled when a redundant display is provided for.

3. Electronic equipment shall comply with
   a) the ergonomic principles as set out in the International Standards ISO 6385 : 2016 and ISO 9241-210 : 2019 or
   b) an equivalent regulation or Standard recognised by one of the Member States.

Article 12.09
Failure or malfunction

1. In case of a failure or malfunction of an electronic equipment, system and network, the crew shall be able to keep the vessel in a safe state. This requirement is deemed fulfilled when the requirements of (2) to (4) are met.

2. Electronic equipment, systems and networks shall be provided with self-diagnostic and self-monitoring features which allow to detect an internal malfunction and determine the reason for this malfunction.

3. Any failure or malfunction of an electronic equipment, system or network shall trigger an acoustic and optical alarm signal in the wheelhouse or another location permanently manned by crew. The optical alarm signal shall display a dedicated failure or malfunction.

4. Where this Standard requires the ability of an emergency shutdown of an equipment or a system, the manual intervention shall be possible even if the equipment or system is controlled electronically.

Article 12.10
Control, monitoring and safety systems

1. Safety systems shall act on the lowest possible equipment level.

2. Safety systems shall not be affected by control or monitoring systems.

3. Sensors for a safety system shall be first routed to the safety system. The information coming from these sensors may also be routed to the control and monitoring systems.

4. Control and monitoring systems may be combined in one electronic system.

5. An electronic system shall be designed in such a way that a failure of one equipment of the electronic system does not result in the failure of any other electronic equipment of this system.

6. One or several logging systems shall be foreseen to register all alarms in chronological order allowing for ex post analyses. They shall provide for a data storage of the last 7 days as a minimum.

Article 12.11
Back-up power supply

1. For the HMI of electronic equipment or systems, the provisions of Article 7.03(8) apply.

2. Changing from one power source to another, or any interruption of the power supply, shall not require an electronic equipment or an electronic system to be rebooted manually.

3. In the event of a failure of one of the power sources in accordance with Article 10.02, an acoustic and optical alarm shall be triggered in the wheelhouse or another location permanently manned by crew."

37. Article 13.01 is amended as follows:

a) After (2) the following (2a) is inserted:

"2a. For multihull vessels, the sum of the widths of the various submerged parts of the hull (floats) measured at the plane of maximum draught shall be used instead of the width B for calculating the total mass of the anchors in accordance with (1) and (2)."

b) (14) is worded as follows:

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

38. Article 13.03(1)(c) (concerns only the Dutch version)

39. Article 13.03(2), alinea 2, is worded as follows:

"By way of derogation on vessels with no liquefied gas installations, spray foam fire extinguishers using ~~aqueous film-forming foam (AFFF)~~fluorine-free foam (F3) 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."

40. Article 13.05(5)(c), alinea 2, is worded as follows:

"Non-mechanical triggering devices shall be powered from two different mutually independent power sources. These power sources shall be located outside the room to be protected. Control lines in the room to be protected shall be designed so as to remain functional for at least 30 minutes in the event of fire. This requirement shall be fulfilled in the case of electric wiring if it complies with the International Standards ~~IEC 60331-21 : 1999~~ IEC 60331-1 : 2018 or IEC 60331-2 : 2018."

41. Article 13.08(1) is worded as follows:

"1. On board craft there shall be at least three lifebuoys:

- in accordance with European Standard EN 14144 : ~~2003~~2025; or
- in accordance with the 1974 International Convention for the Safety of Life at Sea (SOLAS 1974), Chapter III, Regulation 7.1, and the International Life-Saving Appliance (LSA) Code, sub-section 2.1.

They shall be ready for use and attached to the deck at appropriate points without being attached to their mounting. At least one lifebuoy shall be in the immediate vicinity of the wheelhouse and shall be equipped with a self-igniting, battery-powered light that will not be extinguished in water."

42. Article 14.01(1) (concerns only the French and Dutch version)

43. Article 14.02 is amended as follows:

a) (3) (concerns only the Dutch version)

b) (4) is worded as follows:

"4. The outer edges of decks and side decks, as well as work ~~stations~~areas where persons might fall more than 1 m, shall be fitted with bulwarks or coamings that are at least 0,90 m high or with a continuous guard rail in accordance with European Standard EN 711 : ~~2016~~2024. Where the shipside guard rails are retractable,

a) a continuous handrail 0,02 to 0,04 m in diameter shall additionally be secured to the coaming at a height of 0,70 to 1,10 m; and

b) signs in accordance with Annex 4, Figure 10, at least 15 cm in diameter, shall be affixed in clearly visible positions at the point where the side deck begins."

c) (6)(a) and (b) is worded as follows:

"a) the passageways run over those decks;

b) the passageways and work ~~stations~~areas on those decks are surrounded by fixed guard rails in accordance with EN 711 : ~~2016~~2024; and".

d) (7) is worded as follows:

"7. At work ~~stations~~areas where there is danger of falling more than 1 m the inspection body may require appropriate fittings and equipment to ensure safe working."

44. Article 14.04(3) is worded as follows:

"3. By way of derogation from (1), the clear width of the side deck may be reduced to 0,50 m, provided that the outer edge of the side deck is fitted with a guard rail in accordance with European standard EN 711 : ~~2016~~2024 to prevent falling."

45. Article 14.05 is worded as follows:

"Article 14.05
Access to work stations

1. ~~Points of access and passageways for~~Access to work stations shall be safe and guaranteed by corridors, accesses and passages allowing the movement of persons and objects. They shall be of sufficient size and so arranged that:
   a) in front of the access opening, there is sufficient room not to impede movement;
   b) the clear width of the passages~~way~~ shall be appropriate for the intended use of the ~~working space~~work station and shall be not less than 0,60 m, except in the case of craft less than 8 m wide, where it may be reduced to 0,50 m;
   c) the clear height of the passage~~way~~ including the sill is not less than 1,90 m.

2. Doors shall be so arranged that they can be opened and closed safely from either side. They shall be protected against accidental opening or closing.

3. Appropriate stairs, ladders or steps shall be installed in accesses, exits and corridors~~passageways~~ where there is more than a 0,50 m difference in floor level.

4. Work stations which are manned continuously shall be fitted with stairs if there is a difference in floor level of more than 1,00 m. This requirement shall not apply to emergency exits.

5. Vessels with holds shall have at least one permanently installed means of access at each end of each hold.

   By way of derogation from the first sentence the permanently installed means of access may be dispensed with if at least two movable ladders are provided which reach at least 3 rungs over the hatch coaming at an angle of inclination of 60°."

46. Article 14.08(2) is worded as follows:

"2. The floors of interior ~~working spaces~~work stations shall be solid and durable, and shall be designed not to cause tripping or slipping. Openings in decks and floors shall, when open, be secured against the danger of falling. Windows and skylights shall be so arranged and fitted that they can be operated and cleaned safely."

47. Article 14.09 is worded as follows:

"Article 14.09
Protection against noise and vibration

1. ~~Working spaces~~Work stations shall be so situated, equipped and designed that employees are not exposed to harmful vibrations.

2. Rooms with ~~P~~permanently occupied ~~working spaces~~work stations shall, in addition, be so constructed and sound-proofed that the health and safety of employees are not affected by noise.

3. For persons who are likely to be exposed to noise levels exceeding 80 dB(A) every day, individual acoustic protection devices shall be available. ~~In working spaces~~At work stations where the noise level can exceed 85 dB(A) it shall be indicated that wearing of acoustic protection devices is mandatory by a symbol 'Wear acoustic protection device' with a diameter of at least 10 cm in accordance with Figure 7 of Annex 4."

48. Article 14.12 is amended as follows:

a) (4) is worded as follows:

"4. The presence of devices to protect against crushing or shearing hazards is mandatory. ~~The outer parts of the crane shall leave a minimum safety clearance of 0,50 m relative to fixed superstructure in workstations and passageways.~~ If the crane is placed within work areas or at passageways, the outer parts of the crane shall leave a minimum safety clearance of 0,50 m relative to fixed superstructure."

b) After (9), the following (10) is inserted:

"10. Lifting devices with a working load not exceeding 2000 kg, intended exclusively for launching the ship's boat or life rafts, shall only comply with (1) and (7) of this Article."

49. Article 15.07(3), 3rd sentence (concerns only the Dutch version)

50. Article 16.02(1) (concerns only the Dutch version)

51. Article 19.01(5) is worded as follows:

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

52. Article 19.02(1)(a) is worded as follows:

"a) the minimum thickness t_{min} of the bottom, bilge and side plating of the outer hull of passenger vessels is determined in accordance with the larger value of the following formulae:

$t_{1_{min}} = 0{,}006 \cdot a \cdot \sqrt{T}\ [mm]$;

$t_{2_{min}} = f \cdot 0{,}55 \cdot \sqrt{~~L_E~~ L_{WL}}\ [mm]$.

In these formulae:

$f = 1 + 0{,}0013 \cdot (a - 500)$;

a = longitudinal or transverse frame spacing (mm), and where the frame spacing is less than 400 mm, $a = 400\ mm$ should be entered;".

53. Article 19.03 is amended as follows:

a) (1), second sentence, is deleted.

b) (3), alinea 1, is worded as follows:

"3. The proof of adequate intact stability by means of a calculation shall be produced using the following definitions for the intact stability and for the standard loading conditions mentioned in (2)~~(a) to (d)~~:".

c) After (13), the following (14) is inserted:

"14. The proof of intact and damage stability shall be checked and approved by the inspection body. The inspection body shall enter the main information of the proof of stability, at least the person who established it and the date of establishment, in item 52 of the inland navigation vessel certificate. A copy of the proof of stability shall be permanently kept onboard."

54. Article 19.05(1) (concerns only the French version)

55. Article 19.06 is amended as follows:

a) (10), 1st sentence, is worded as follows:

"Parts of the deck intended for passengers, and which are not enclosed, shall be surrounded by a fixed bulwark or guard rail at least 1,00 m high or a railing according to the European Standard EN 711 : ~~2016~~2024, construction type PF, PG or PZ".

b) (12)(e) is worded as follows:

"e) Gangways shall be constructed in accordance with European Standard EN 14206 : ~~2003~~2025. By way of derogation from Article 13.02(3)(d), their length can be less than 4 m."

56. Article 19.08(3)(c) is worded as follows:

"c) an alarm system enabling the vessel's command to alert the crew and shipboard personnel, referred to in Article 7.09(1).
The alarm system shall also reach the recreation rooms for the shipboard personnel, the cold-storage rooms and other store rooms.
The alarm system shall be triggered by the corresponding alarm signals for TGAIN set out in Annex 5, Section VI."

57. Article 19.09(1) is worded as follows:

"1. In addition to the lifebuoys specified in Article 13.08(1), all parts of the deck intended for passengers and not enclosed shall be equipped with suitable lifebuoys, which shall be positioned on both sides of the vessel not more than 20 m apart. Lifebuoys shall be considered as suitable if they comply with

- the European Standard EN 14144 : ~~2003~~2025; or
- the International Convention for the Safety of Life at Sea (SOLAS 1974) Chapter III Regulation 7.1 and the International Life-Saving Appliance (LSA) Code, (2.1).

Half of all the prescribed lifebuoys shall be fitted with a buoyant cord at least 30 m long with a diameter of 8 to 11 mm. The other half of the prescribed lifebuoys shall be fitted with a self-igniting, battery-powered light which will not be extinguished in water."

58. Article 19.12(10) is worded as follows:

"10. On cabin vessels there shall be:

a) two self-contained breathing apparatus sets corresponding to European Standard EN 137 : 2006 of Type 2 with full-face masks corresponding to European Standard EN 136 : 1998;

b) two sets of equipment consisting of at least a protective suit, helmet, boots, gloves, axe, crowbar, torch and safety-line, and

c) four ~~smoke~~escape hoods in accordance with European Standard EN 403 : 2004 or an equivalent standard recognised by one of the Member States."

59. Article 19.13(2)(w) is worded as follows:

"w) self-contained breathing apparatus sets, as well as sets of equipment and ~~smoke~~escape hoods referred to in Article 19.12(10);"

60. Article 19.15 is amended as follows:

a) (5), introductory sentence and (a) to (c), is worded as follows:

"In addition, the passenger vessel shall have:

a) a main propulsion system with rudder propeller, a cycloidal propeller or a water jet as main propulsion, or

b) a main propulsion system with two propulsors ~~propulsion units~~, or

c) a main propulsion system and a bow-thruster."

b) (10) is worded as follows:

"10. For cabin vessels with a length L of not more than 45 m, Article 19.12(10), shall not apply, provided ~~smoke~~ escape hoods in a number corresponding to the number of sleeping berths are readily accessible in each cabin."

61. Article 21.05(1)(c), third sentence, is worded as follows:

"This requirement shall not apply to craft that are steered by their propulsors ~~propulsion units~~ such as rudder propellers or cycloidal propellers."

62. Article 21.06(2) is worded as follows:

"2. If during the navigation tests referred to in (1) there are specific installations on board the craft that are being either pushed or propelled side-by-side, such as the steering system, propulsion ~~units~~ systems or manoeuvring equipment, or articulated couplings in order to meet the requirements set out in Articles 5.02 to 5.10, the following shall be entered on the inland navigation vessel certificate for the craft propelling the convoy: formation, position, name and unique European vessel identification number of those craft which are fitted with the specific installations used."

63. Article 22.01 third sentence is worded as follows:

"Propulsion means ~~units~~ permitting only restricted manoeuvres ~~short-haul operation~~ shall not constitute own means of propulsion."

64. Article 22.03(1) (concerns only the French version)

65. Article 23.01, alinea 1 (concerns only the French version)

66. Article 25.01(2) is amended as follows:

a) (h) is worded as follows:

"h) Chapter 27:

Chapter 27 shall be deemed to have been complied with when stability complies with current IMO Resolutions, the corresponding stability-related documents have been endorsed by the competent authority and the containers are secured in the customary maritime navigation manner.;".

b) A new (i) is added after (h) as follows:

"i) to Chapter 30

Articles 30.02(1), 30.04, 30.05 and 30.07 for vessels according to Article 30.01(1) other than vessels equipped with fuel cell systems according to Article 30.01(3)."

67. Article 26.01(1)(e) is worded as follows:

"e) from Chapter 8:

Article 8.01(1), ~~and~~ (2), and

(3) with the exception of internal combustion engines using gasoline as fuel,

Article 8.02(1) and (2), Article 8.03(1) and (2), Article 8.04, Article 8.05(1) to (5),

Article 8.05(6) or as an alternative with the technical requirements of Standard EN ISO 10088 : 2023,

Article 8.05(7) to (10), Article 8.06, Article 8.07, Article 8.08(1), (2), (5), (7) and (10), Article 8.09(1), and Article 8.10;".

68. Article 26.01(2)(c) is worded as follows:

"c) from Chapter 8:

Article 8.01(2), Article 8.02(1), Article 8.03(2), Article 8.05(5), and Article 8.08(2); and

if a propulsion or auxiliary system operating on liquefied natural gas (LNG), methanol or gaseous hydrogen is fitted after placing on the market of the recreational craft, a proof of a post-construction assessment in accordance with Article 23 of Directive 2013/53/EU must be provided;".

69. Article 29.06 is amended as follows:

a) (1) is worded as follows:

"1. Arrangement

a) By way of derogation from Article 7.01(1), wheelhouses shall be arranged in such a way that the ~~helmsman~~person at helm and a second member of the crew may at all times perform their tasks while the vessel is under way.

b) The steering position shall be arranged so as to accommodate work stations for the persons mentioned in (a). The instruments for navigation, manoeuvring, monitoring and communication and other important operating controls shall be sufficiently close together to allow a second member of the crew as well as the ~~helmsman~~person at helm to obtain the necessary information and to operate the controls and installations as necessary while seated. The following requirements shall apply in all cases:

aa) the steering position for the ~~helmsman~~person at helm shall be arranged so as to allow radar navigation by one person;

bb) the second member of the crew shall have his own radar screen (slave) at his work station and shall be able to intervene from his work station to transmit information and control the propulsion of the vessel.

c) The persons mentioned in (a) shall be able to operate the installations mentioned in (b) without any hindrance, including when safety belts are properly worn."

b) (2)(a) is worded as follows:

"a) By way of derogation from Article 7.02(2), the area of obstructed vision for the ~~helmsman~~person at helm in a seated position ahead of the vessel shall not exceed one vessel length, irrespective of the loading conditions."

70. Chapter 30 is worded as follows:

"CHAPTER 30
SPECIAL PROVISIONS APPLICABLE TO CRAFT EQUIPPED WITH PROPULSION OR AUXILIARY SYSTEMS OPERATING ON FUELS WITH A FLASHPOINT EQUAL TO OR LOWER THAN 55 °C

Article 30.00
Definition

For the purposes of this Chapter, the following definition shall apply:

1. 'propulsion and auxiliary system': any system using fuel, including fuel tanks, tank connections, fuel preparation systems, piping, valves, energy converters (such as engines, turbines or fuel cells), control, monitoring and safety systems.

2. 'fuel containment system': the arrangement for the storage of fuel with a flashpoint equal to or lower than 55 °C, including but not limited to tanks, tank connections, possible thermal insulation and pressure relief devices.

Article 30.01
Scope of application

1. This chapter applies to craft with propulsion or auxiliary systems operating on fuels with a flashpoint equal to or lower than 55 °C.

2. In addition to the requirements of this chapter, Annex 8 applies, providing requirements that are specific for the storage and energy converters for the different fuels.

3. The provisions of this Chapter shall not apply to fuel cells components, which are part of auxiliary systems operating on fuels with a flashpoint equal to or lower than 55 °C and with a cumulative reference power that is less than 20 kW.

Article 30.02
General

1. Craft according to Article 30.01(1) must comply with the mitigation measures identified by the risk assessment according to Article 30.04.

2. If the energy converter of the craft generates gaseous or particulate pollutants but does not fall in the scope of application of Chapter 9, the emissions of gaseous and particulate pollutants from the energy converter shall be equivalent or lower than those of the internal combustion engines referred to in Article 9.01(2). The inspection body may ask for a report which demonstrates its compliance to this requirement.

Article 30.03
Tasks of the inspection body and technical service, documentation

1. Propulsion and auxiliary systems of craft according to Article 30.01(1) shall be constructed and installed under the supervision of the inspection body.

2. For the purpose of discharging tasks pursuant to this chapter, the inspection body may employ a technical service. The technical services shall satisfy the European Standard EN ISO 17020 : 2012. The knowledge of the technical service shall cover at least the following areas:

   a) fuel system including tanks, heat exchangers, pipelines,

   b) strength (longitudinal and local) and stability of the craft,

   c) electrical installation and control, monitoring and safety systems,

   d) ventilation system,

   e) fire safety, and

   f) gas warning equipment.

   Manufacturers and distributors of propulsion or auxiliary systems, or parts of these systems, cannot be recognised as technical services.

   The supervision and testing according to Articles 30.03(1) and 30.11 may be performed by different technical services provided that all the expertise described above is taken into account in the process.

3. Before commissioning of a propulsion or auxiliary system according to Article 30.01(1), the following documents shall be submitted to the inspection body:

   a) a risk assessment according to Article 30.04,

   b) a description of the propulsion or auxiliary system,

   c) drawings of the propulsion or auxiliary system,

   d) a diagram of the pressure and temperature within the system,

   e) the operating manual according to 30.05(5), and

   f) a safety rota according to Article 30.05(1).

4. The technical documentation according to (3) shall enable an assessment of whether craft, propulsion and auxiliary systems and their components comply with the applicable rules, regulations, standards applied and principles regarding safety, availability, maintainability and reliability.

5. A copy of the documents according to (3) shall be kept on board.

Article 30.04
Risk assessment

1. A risk assessment shall be conducted to ensure that risks arising from the use of fuels with a flashpoint equal to or lower than 55 °C affecting people on board including passengers, the environment, the structural strength and the integrity of the craft, are addressed.

2. The risk assessment shall include at least:

   a) a hazard identification (HAZID) which combines techniques described in ISO 31010 : 2019, to identify risks, assess the risks and provide measures to eliminate or mitigate these risks. In selecting the appropriate techniques, the nature and scale of the propulsion or auxiliary system in the craft, as well as the experience of similar systems is to be considered.

   b) the classification of hazardous areas on board, divided into Zones 0, 1 and 2, according to Article 1.01(3.25) to (3.28).

   In the light of the outcome of the hazard identification (HAZID), the inspection body may request additional risk analysis (e.g. quantitative risk analysis, failure modes, effects and (criticality) analysis (FME(C)A), hazard and operability study (HAZOP) or fire and explosion risk analysis).

3. As a minimum, the process of the hazard identification (HAZID) shall consider the following risks:

   a) hazards associated with physical layout,

   b) the mechanical damage to components,

   c) influences related to

      aa) operations, including passing of locks, mooring, and in environments where explosive atmosphere may accumulate (e.g. ship lift, tunnels, usw.),

      bb) bunkering,

      cc) purging,

      dd) maintenance,

      ee) cargo and

      ff) weather.

   d) electrical failures,

   e) unintended chemical reactions,

   f) release of toxic vapours,

   g) self-ignition of fuels,

   h) fire,

   i) explosion,

   j) temporary power outage (blackout),

   k) flooding of water in parts of the craft which may contain fuel or hazardous vapours,

   l) craft sinking.

4. As a minimum, the process of the hazard identification (HAZID) shall involve:
   a) a risk assessment facilitator,
   b) fuel related safety experts,
   c) craft and system designers,
   d) the shipyard or equivalent entity having an overview of the shipbuilding,
   e) the equipment suppliers,
   f) the future craft operator,
   g) a boatmaster.

   The inspection body must be permitted to attend as observer the risk assessment process.

5. The risk assessment shall ensure that risks are eliminated wherever possible. Risks which cannot be eliminated entirely are to be mitigated to an acceptable level in accordance with (6). Details of risks, and the measures by which they are mitigated, shall be documented to the satisfaction of the inspection body.

6. Craft according to Article 30.01(1) must fulfil the following requirements:
   a) A single failure in parts of the craft which may contain fuel or hazardous vapours, such as engines, fuel tanks and associated piping, shall not lead to an unsafe situation.
   b) The level of safety, reliability and dependability of the craft shall be at least equivalent to that of craft with main and auxiliary machinery using fuels having a flashpoint of more than 55 °C.
   c) The probability and consequences of fuel-related hazards shall be minimised through system design. Failure of risk-reducing measures shall lead to measures mitigating the impact on safety.
   d) Fuel supply, storage and bunkering arrangements shall be suitable to receive and contain fuel in the required state without leakage or venting under normal operating conditions.
   e) A fire or explosion in parts of the craft which may contain fuel or hazardous vapours shall not:
      aa) damage or disrupt the proper functioning of equipment/systems located in any space other than that in which the incident occurs;
      bb) damage the craft in such a way that flooding of water below the main deck or any progressive flooding occurs;
      cc) damage work areas or accommodation in such a way that persons who stay in such areas under normal operating conditions are injured or exposed to hot temperatures or toxic substances;
      dd) injure persons as well as prevent persons' access to life-saving appliances or impede escape routes either by physical blockage, heat or toxic substances.

7. In agreement with the inspection body, the scope of the risk assessment can exclude concepts in whole or in part that have been previously subjected to a risk assessment, provided that:
   a) there are no changes to the arrangements or design, location of the installation, mode of operation, type of fuels, use of surrounding spaces or to the number of persons exposed, and
   b) mitigation measures taken as a result of previous risk assessments are included.

Article 30.05
Safety organisation

1. A safety rota shall be provided on board craft according to Article 30.01(1). The safety rota shall include safety instructions according to (2) and a safety plan according to (3) of the craft.

2. These safety instructions shall include information on at least the following measures:
   a) emergency shutdown of the system,
   b) measures in the event of accidental release of liquid or gaseous fuel, for instance during bunkering,
   c) measures in the event of fire or other incidents on board,
   d) measures in the event of collision,
   e) use of safety equipment,
   f) raising the alert, and
   g) evacuation.

3. The safety plan shall include information on at least the following areas and equipment:
   a) hazardous areas,
   b) escape routes, emergency exits and gastight rooms,
   c) life-saving equipment and ships' boats,
   d) fire extinguishers, fire-fighting systems and sprinkler systems,
   e) alarm systems,
   f) emergency circuit-breakers' controls,
   g) fire dampers,
   h) emergency power sources,
   i) ventilation system controls,
   j) controls for fuel supply lines, and
   k) safety equipment.

4. The safety rota shall:
   a) be duly stamped by the inspection body, and
   b) be available at a permanently manned location.

   The safety plan according to (3) shall be prominently displayed at one or more appropriate points on board.

5. A detailed operating manual of the propulsion and auxiliary system shall be provided on board craft according to Article 30.01(1), and shall at minimum:

   a) contain practical explanations about bunkering system, fuel containment system, fuel piping system, fuel supply system, engine or energy converter room, ventilation system, leakage prevention and control, monitoring and safety systems,

   b) describe the bunkering operations, especially valves operation, purging, inerting and gas freeing. This may also include the exchange of swappable tanks.

   c) describe the relevant method of electrical insulation during bunkering operations, and

   d) describe the details of risks identified in the risk assessment as referred to in Article 30.04 and in an easily identifiable manner the means by which they are mitigated, including extent and location of safety distances to other vessels and other safety measures while passing of locks, bunkering and mooring.

Article 30.06
Marking

Service rooms and system components shall be appropriately marked with a symbol in accordance with the corresponding figure of Annex 4, which clearly shows for what fuels they are being used, with a side length of at least 10 cm.

Article 30.07
Independent propulsion

In the event of an automatic shutdown of the propulsion system or parts of the propulsion system, the craft shall be able to make steerageway under its own power.

Article 30.08
Fire safety

1. Fire detection, protection and extinction measures appropriate to the hazards concerned shall be provided on board.

2. An appropriate fixed fire alarm system shall be provided for all rooms and spaces of the propulsion and auxiliary system where fire cannot be excluded.

3. An appropriate firefighting system shall be provided for all rooms and spaces of the propulsion and auxiliary system.

Article 30.09
Electrical installations

1. In accordance with Article 10.04, equipment for hazardous areas shall be of an appropriate type according to zones where such equipment is installed.

2. Electrical generation and distribution systems and associated control systems shall be designed such that a single failure will not result in the release of fuel.

3. The lighting system in hazardous areas shall be divided between at least two branch circuits. All switches and protective devices shall interrupt all poles and phases and shall be located in a non-hazardous area.

Article 30.10
Control, monitoring and safety systems

1. Each propulsion and each auxiliary system of craft according to Article 30.01(1) shall be fitted with its own control and monitoring system and its own safety system. These systems must be independent from each other. All elements of these systems shall be capable of being functionally tested.

2. Spaces in which the propulsion or auxiliary system is installed shall be equipped with permanently installed devices for gas detection and leakage monitoring. The number, type and redundancy of detectors in each space shall correspond to the size, layout and ventilation of the space. Permanently installed gas detectors shall be installed where gas may accumulate and in the ventilation outlets of these spaces.

3. Instrumentation devices shall be fitted to allow a local and a remote reading of essential parameters, where they are necessary to ensure a safe operation of the whole system including bunkering.

Article 30.11
Testing

1. Propulsion and auxiliary systems of craft according to Article 30.01(1) shall be inspected by the inspection body:
   a) before commissioning,
   b) after any modification or repair, and
   c) regularly, at least once a year.

   The relevant instructions of the manufacturers shall be taken into account in the process.

2. The inspections referred to in (1)(a) and (c), must at least cover:
   a) a check of conformity of the propulsion and auxiliary systems with the approved drawings and in the case of subsequent checks, whether alterations in the propulsion or auxiliary system were made,
   b) if necessary, a functional test of the propulsion and auxiliary systems for all operational possibilities,
   c) a visual check and a tightness check of all system components, in particular valves, pipelines, hoses, pistons, pumps and filters,
   d) a visual check of the electrical and electronic appliances of the installation, and
   e) a check of the control, monitoring, and safety systems.

3. The inspections referred to in (1)(b) shall include at least the parts of (2) which have been modified or repaired.

4. For each inspection according to (1), an inspection attestation shall be issued showing the date of inspection."

71. Chapter 32 is worded as follows

"CHAPTER 32
TRANSITIONAL PROVISIONS FOR CRAFT WHICH ARE ALREADY IN SERVICE

Article 32.01
Applicability of transitional provisions to craft which are already in service

1. This Standard applies to craft which are already in service. However, transitional provisions apply to these craft in accordance with the deadlines and provisions listed in the table under (6).

2. To benefit from the transitional provisions for craft fit to operate on the Rhine, it must be proved that those craft were inspected for the first time in accordance with:
   a) the Rhine Vessel Inspection Regulations, as applicable on the date of that first inspection, and a Rhine vessel certificate has been granted accordingly, or;
   b) the provisions of Directive 2006/87/EC applicable for Zone R, as applicable on the date of that first inspection on or after 30 December 2008, and a Community certificate has been granted accordingly, or;
   c) the provisions of Directive (EU) 2016/1629 applicable for Zone R, as applicable on the date of that first inspection on or after 7 October 2018, and a Union certificate has been granted accordingly.

   Traffic licences other than those referred to in letters (a), (b) and (c) (type and date of issue) do not allow to navigate on the Rhine.

3. To benefit from the transitional provisions for craft fit to operate exclusively on waterways outside the Rhine, it must be proved that those craft were inspected for the first time in accordance with:
   a) the provisions of Chapters 1 to 12 of Annex II to Directive 82/714/EEC, as applicable on the date of that first inspection before 30 December 2008 and a Community certificate has been granted accordingly, or;
   b) the provisions of other regulations, and at least equivalent to those of Chapters 1 to 12 of Annex II to Directive 82/714/EEC, as applicable on the date of that first inspection before 30 December 2008 and another traffic licence has been granted accordingly.

4. The inspection body verifies the date of the first inspection and the certified operating area. In case of craft referred to in (2) that have been inspected for the first time before 1 April 1976 it is sufficient to verify the first inspection has taken place before that date.

   In case of craft referred to in (3) that have been inspected for the first time before 1 January 1985 it is sufficient to verify the first inspection has taken place before that date.

5. Operating areas relating to the application of the transitional provisions in accordance with (2) or (3) shall be entered in item 10 of the inland navigation vessel certificate.

6. The following definitions apply in the table below:

   'N.R.C.': the requirement does not apply to craft which are already operating, unless the parts concerned are replaced or converted, i.e. the requirement applies only to Newly built craft and to the Replacement or Conversion of the parts or areas concerned. If existing parts are replaced by replacement parts using the same technology and of the same type, this does not constitute replacement 'R' within the meaning of the transitional provisions.

   'Issue or renewal of the inland navigation vessel certificate': the requirement must be complied with the time of the next issue or renewal of the inland navigation vessel certificate after the date indicated.

   'R': the craft is fit to operate on the Rhine (Zone R) and other waterways.

   'no R': the craft is fit to operate exclusively on waterways outside the Rhine (outside Zone R).

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
CHAPTER 3						
3.03	(1)	Installation of collision and aft-peak bulkheads	No R	1.1.1985	N.R.C.	
	(1)(a)	Location of collision bulkhead	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(1)(b)	Location of aft-peak bulkhead	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(2)	No accommodation ahead of the plane of the collision bulkhead*	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
			No R	1.1.1985	N.R.C.	
		No accommodation aft of the aft-peak bulkhead*	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2060
			No R	1.1.1985	N.R.C.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
		Safety installation forward of the collision bulkhead*	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
			No R	1.1.1985	N.R.C.	
		Safety installation aft of the aft-peak bulkhead*	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
			No R	1.1.1985	N.R.C.	
	(4), 1st sentence	Gastight separation of accommodations from engine rooms, boiler rooms and holds*	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(5), 1st sentence	No openings in bulkheads and separations	No R	1.1.1985	N.R.C.	
	(5), 2nd and 3rd sentences	Design and monitoring of doors in aft-peak bulkhead	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(7)	Anchors not protruding in fore-sections of vessels	R	1.1.2001	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2041
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
3.04	(2)	No common surfaces of bunkers and accommodation and passenger rooms	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	1.1.1985	N.R.C.	
	(6)	Exits of engine rooms which were not considered as engine rooms according to Article 1.01 before 1995*	R	1.1.1995	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
	(6)	Exits of engine rooms*	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(7)	Maximum permissible sound pressure level	No R	1.1.1985	N.R.C.	
CHAPTER 4						
4.01	(1)	Safety clearance	No R	1.1.1985	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2020
4.02		Freeboard	No R	1.1.1985	N.R.C.	
4.03		Draught marks	R	1.1.1995	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
CHAPTER 5						
5.06	(1), 1st sentence	Minimum speed	R	1.1.1996	At the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
CHAPTER 6						
6.01	(1)	Manoeuvrability required by Chapter 5	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(3)	Permanent lists and ambient temperatures	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
			No R	1.1.1985	N.R.C.	
	(7)	Design of rudder stocks	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
6.02	(1), 1st sentence	In case a second independent hydraulic steering apparatus drive unit is required, separate pilot valve and separate pipework shall be present for the second hydraulic drive unit*	R	1.4.2007	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2020

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
		In case a second independent hydraulic steering apparatus drive unit is required, separate pilot valve, separate pipework and separate hydraulic tanks shall be present*	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2026
	(3)	Manoeuvrability required by Chapter 5 ensured by second drive unit or manual drive	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
6.03	(1)	No connection of other consumers to hydraulic steering apparatus drive unit	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2026
6.05	(1)	Wheel of manual drive not driven by powered drive unit	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
6.06	(1)	Two independent steering controls	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
6.08	(1)	Compliance of rate-of-turn regulators and their components to requirements for electronic installations	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(6)	Rate-of-turn regulators that are connected to a TGAIN	R, no R	1.1.2028	Rate-of-turn regulators installed before the 1.1.2028 may continue to be used, in connection with a TGAIN, when they comply with Annex 5, Section VIII, Articles 1.01(1) and (2), 1.02(1) and (2), 1.03, 1.05, 1.07, 1.08, 1.09, 1.10, 1.11(1)(b) to (e), 1.12(1), (2), (3) and (4)(a), 2.01(1) and (3), 2.02, 2.03, 2.04 and 2.05.	
CHAPTER 7						
7.02	(2)	Obstructed vision for the person at helm ahead of the vessel	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2049
	(3), 3rd sentence	Unobstructed view in the person at helm's usual axis of vision	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(3), 4th sentence	Unobstructed view towards the rear	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2049
	(4) and (5)	Clear view through the front windows	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2049

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(6), 1st sentence	Minimal light transmission*	R	31.12.1994	N.R.C. for vessels with tinted windows satisfying the following conditions: - The windows are tinted green and exhibit a minimum light transmission of 60 %, - The wheelhouse ceiling is so designed as to preclude reflections on the windows, - Light sources in the wheelhouse must be steplessly dimmable or capable of being switched off, - All reasonable measures to avoid other reflections have been taken.	
			No R	30.12.2008	N.R.C. for vessels with tinted windows satisfying the following conditions: - The windows are tinted green and exhibit a minimum light transmission of 60 %, - The wheelhouse ceiling is so designed as to preclude reflections on the windows, - Light sources in the wheelhouse must be steplessly dimmable or capable of being switched off. - All reasonable measures to avoid other reflections have been taken.	
					For other vessels, N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2024

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
		Safety glass design*	R, no R	7.10.2018	N.R.C.	
7.03	(8)	Automatic switch to another power source	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
7.04	(2)	Control of each main engine	R	31.12.1994	Unless the steering position has been designed for radar navigation by one person: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035 if the direction of motion can be achieved directly
						1.1.2010 for other engines
			No R	30.12.2008	Unless the steering position has been designed for radar navigation by one person: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050 if the direction of motion can be achieved directly
						1.1.2025 for other engines
	(10)(a), (b) and (c)	Monitoring of operational temperature, lubricating-oil pressure and oil and air pressure	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(10)(d), (e) and (f)	Rotational speed of the propulsion engines, rotational speed of the propulsors, direction of thrust imparted to the vessel by the propulsors	No R	30.12.2008	Unless the steering position has been designed for radar navigation by one person: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(11)(a), (b) and (c)	Alarm of operational temperature, lubricating-oil pressure and oil and air pressure	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(11)(e)	Filling level control not only for main engines but also other engines needed for safe operation of the vessel	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(11)(f)	Level alarm of the hydraulic tanks and alarm of the service pressure	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2026
7.05	(1)	Navigation lights, their casings, accessories and light sources	R, no R	1.12.2009	N.R.C. if the navigation lights, their casings, accessories, and light sources fulfill - the requirements for colour and light intensity of lights on board, and for the admission of navigation lights for navigation on the Rhine, as of 30 November 2009, or - the respective requirements of a Member State as of 30 November 2009.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
7.06	(1)	Navigational radar installations and rate-of-turn indicators	R, no R	1.12.2024	Navigational radar installations and rate-of-turn indicators with type-approval based on - minimum requirements and test conditions for radar installations used for navigation on the Rhine, as well as the minimum requirements and test conditions for rate-of-turn indicators used for navigation on the Rhine on or after January 1st, 1990, - minimum requirements and test conditions of the Directive 2006/87/EC on or after December 31st,2006, - minimum requirements and test conditions of the Resolution CCNR 2008-II-11 on or after December 1st, 2009, or - European standard EN 302 194-1 : 2006 before 31 December 2023, may continue to be used. They may continue to be installed then be used.	
			No R	30.12.2008	Navigational radar installations and rate-of-turn indicators, which have been type-approved and installed pursuant to a Member State's regulations before 31st December 2012 may continue to be maintained and used until the renewal of the inland navigation vessel certificate after These installations must be entered in item 52 of the inland navigation vessel certificate.	1.1.2019

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(2)	Inland ECDIS equipment being operated in navigation mode	R, no R	1.1.2026	Inland ECDIS equipment with a type-approval according to - edition 2.4 (or previous ones) of the Inland ECDIS Standard, ES-RIS 2021/1 or ES-RIS 2023/1, and installed before the 1st January 2026, - European standard EN 302 194-1 : 2006 before 31 December 2023, may continue to be used. They may continue to be installed then be used if the current edition of the presentation library and the feature catalogue as required by ES-RIS (Parts I and V) has been implemented in the equipment.	
	(3)	Inland AIS equipment	No R	30.12.2008	N.R.C.	
			R, no R	1.1.2024	Inland AIS equipment with a type-approval according to - edition 1.0 and 1.01 of the Test Standard for Inland AIS and installed before the 1st December 2015 - edition 2.0 of the Test Standard for Inland AIS and installed before the 1st January 2024 may continue to be used.	
			R, no R	1.1.2026	Inland AIS equipment with a type approval according to - edition 2021/3.0 of the Test Standard for Inland AIS, ES-RIS 2021/1 or ES-RIS 2023/1, may continue to be installed then be used.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(6)	TGAIN	R, no R	1.1.2028	TGAIN installed before the 1.1.2028 may continue to be used, when the manufacturer provides an attestation of compliance with Annex 5, Section I, Article 3.03, and Section VI, Articles 1.01(1)(2) and (4), 1.02(1)(3)(4) and (6), 1.03, 1.04, 1.05, 1.07 (but the display only needs to comply with ES-RIS, Part I, Articles 2.03(17) and 2.08), 1.08, 1.09, 1.10, 1.11, 1.12, 1.13(1) and (2), and 1.14 (but a recording duration of at least 4 days is accepted). The competent authority or the approved specialist firms perform the installation and performance test for TGAIN installed before the 1.1.2028 at the times specified in Annex 5, Section I, Article 3.02(1).	
7.12		Elevating wheelhouses	No R	1.1.1985	N.R.C.	
	(4), 3rd sentence	Roof opening used as an emergency exit	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(5), 2nd sentence	Indications	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(6)	Stopping, locking and automatic deactivation	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(8), 1st and 2nd sentences	Arrangements and protection features	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(8), 3rd sentence	Symbol and warning device	R, no R	1.1.2026	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(8), 4th sentence	Optical warning signal*	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(9)	Emergency lowering system for lifting mechanisms which are not hydraulic*	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2040
7.14	(3) 2nd sentence	Enter and leave the wheelhouse, whatever its position	R, no R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(3) 3rd sentence	Dimensions of the opening in the roof	R, no R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
	(4)	Stopping, locking and automatic deactivation	R, no R	1.1.2024	N.R.C.	
	(5)	No exceeding of terminal position	R, no R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(6) 1st and 2nd sentences	Arrangements and protection features	R, no R	1.1.2024	N.R.C.	
	(7)	Hydraulic hoses	R, no R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
CHAPTER 8						
8.01	(3)	Only internal-combustion engines burning fuels having a flashpoint of more than 55 °C	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
			No R	1.1.1985	N.R.C.	
8.02	(1), 2nd sentence	Securing of engines against unintentional starting	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(4), 1st sentence	Protection of connections of pipes	R	1.4.2007	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
			No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(5)	Jacketed piping system	R	1.4.2007	N.R.C. for vessels that satisfy the following requirements: - Directly at tank outlets, the pipework for the distribution of fuels shall be fitted with a quick-closing valve in accordance with Article 8.05(7). - The engine room where the engine is located is equipped with an appropriate fire alarm system. - The engine was installed before 1.4.2007.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			No R	31.12.2008	N.R.C. for vessels that satisfy the following requirements: - Directly at tank outlets, the pipework for the distribution of fuels shall be fitted with a quick-closing valve in accordance with Article 8.05(7). - The engine room where the engine is located is equipped with an appropriate fire alarm system. - The engine was installed before 1.4.2007.	
8.03	(3)	Optical and acoustical indication in the wheelhouse and switch off the device for the reduction of the engine speed	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(4)	Design of shaft bushings	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
8.05	(1)	Steel tanks for liquid fuels*	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(3)	No fuel tanks located forward of the collision bulkhead*	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
		No fuel tanks aft of the aft-peak bulkhead*	R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(4)	No fuel tanks and their fittings directly above engines or exhaust pipes	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after Until then, appropriate devices must ensure the safe evacuation of fuels.	1.1.2025
	(6), 3rd to 5th sentences	Installation and dimensions of breather pipes and connection pipes	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2020
			No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(7), 1st sentence	Quick-closing valve on the tank operated from deck, even when the spaces in question are closed	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2029
	(9), 2nd sentence	Capacity-gauging devices to be legible up to maximum filling level	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
8.06		Storage of lubricating oil, pipes and accessories	R	1.4.2007	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
			No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
8.07		Storage of oils used in power transmission systems, control and activating systems and heating systems, pipes and accessories	R	1.4.2007	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
			No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
8.08	(2)	Equipment with bilge pumps	No R	1.1.1985	N.R.C.	
	(3) and (4)	Minimum pumping capacity of bilge pumps and diameters of drainage pipes	No R	1.1.1985	N.R.C.	
	(5)	Self-priming bilge pumps	No R	1.1.1985	N.R.C.	
	(6)	Equipment with strainers	No R	1.1.1985	N.R.C.	
	(7)	Automatically closable fitting	No R	1.1.1985	N.R.C.	
	(8), 3rd, 4th, 5th sentences	Simple closing device is not sufficient for connection of ballast spaces to drainage pipes for holds capable of carrying ballast	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(9)	Gauging devices in hold bilges	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
8.09	(1) and (2)	Installations for the storage of oily water and used oils	No R	31.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
8.10	(2)	Noise generated by a vessel under way	R, no R	1.1.2022	The vessels must satisfy the following conditions: the sound pressure level of the noise generated by a vessel under way does not exceed 75 dB(A) at a lateral distance of 25 m from the ship's side.	
			No R	1.1.1985	N.R.C. In case of replacement or conversion, the vessels must satisfy the following conditions: the sound pressure level of the noise generated by a vessel under way does not exceed 75 dB(A) at a lateral distance of 25 m from the ship's side.	
	(3)	Noise generated by a vessel when stationary	R, no R	1.1.2022	The vessels must satisfy the following conditions: the sound pressure level of the noise generated by a vessel when stationary does not exceed 65 dB(A) at a lateral distance of 25 m from the ship's side.	
			No R	31.12.2008	At the latest on renewal of the inland navigation vessel certificate after 1.1.2030, the vessels must satisfy the following conditions: the sound pressure level of the noise generated by a vessel when stationary does not exceed 65 dB(A) at a lateral distance of 25 m from the ship's side.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
CHAPTER 9						
		Emission of gaseous and particulate pollutants from internal combustion engines	R, no R	1.1.2024	Chapter 9 applies to engines with the following exceptions: a) Only Article 9.02 applies for engines which are already installed onboard and aa) non-type-approved or bb) for which no installation test had to be carried out. b) Without prejudice to (a), Article 9.10(2) only applies to repairs of engines carried out after 1 January 2024 including those carried out on an engine in service before this date. c) Without prejudice to (a), Article 9.01(2) does not apply for engines installed before 1 January 2020, if they comply with the provisions on type-approval and installation in force on the installation date.	
CHAPTER 10						
10.01	(1), 2nd sentence	Relevant documents must be submitted to the inspection body	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035

Article, paragraph, sentence (To what we deviate)	*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
		No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
(2)	Documents bearing the stamp of the inspection body for electrical equipment	No R	1.1.1985	N.R.C.	
(2)(a), (b), (c) and (d)	- general plans, - plans of the main switchboards, the emergency switchboards, the distribution switchboards, - indications of power requirements for electrical service equipment, - types of cables indicating conductor cross-sections	R, no R	1.7.1983	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2020
				N.R.C. for vessels with plans containing the following minimum information: - energy sources; - connections to the shore or other external networks; - main and distribution switchboards; - protection devices of the main current; - switches; - cables cross-sections.	
(2)(b)	Plans of main, emergency and distribution switchboards	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(2)(e)	Documentation for electric propulsion systems	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(2)(f)	Plans for electronic steering control, regulating, alarm and safety systems	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(2)(g)	Control circuit plans	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(3)	Design for temperature on deck from -20 °C to +40 °C*	R, no R	1.7.1983	N.R.C.	
	(3)	Design of electrical equipment	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
			No R	1.1.1985	N.R.C.	
10.02		Electricity supply systems	R, no R	1.7.1983	N.R.C.	
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
10.03		Type of protection according to installation location	R, no R	1.7.1983	N.R.C., except for lighting appliances in accumulator rooms and paint lockers.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
10.04		Protection from explosion	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2022
10.05	(4)	Cross-section of earthing conductors	R, no R	1.7.1983	N.R.C.	
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
10.06		Maximum permissible voltages	No R	1.1.1985	N.R.C.	
	(1) table	Three-phase alternating current*	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(2)	Higher voltages	R, no R	1.7.1983	For installations for recharging batteries: N.R.C.	
10.07		Distribution systems	R, no R	1.7.1983	N.R.C.	
10.08	(1)	Compliance with European Standards EN 15869-1, EN 15869-3 and EN 16840	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
			R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2022
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(4)	Protective devices of the connections	R, no R	1.7.1983	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2028
	(5)	Protection of the connection against short circuits and overloads	R, no R	1.7.1983	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2028
	(7)	Indicator devices	R, no R	1.7.1983	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2028
	(8)	Panel on the connection	R, no R	1.7.1983	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2028
	(9)	Connection and disconnection when the line is dead	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2028
10.09		Power supply to other craft	R, no R	1.7.1983	N.R.C.	
10.10		Generators, engines and transformers	No R	1.1.1985	N.R.C.	
	(2)	Installation of transformers	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(3)	Insulation of primary and secondary windings of transformers	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(4)	Tappings on the secondary windings of transformers	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(5)	Plate provided by the manufacturer for engines, generators, transformers	R, no R	7.10.2018	N.R.C. except for engines, which come under Chapter 9 or Regulation (EU) 2016/1628 or Chapter 8a of the Rhine Vessel Inspection Regulations.	
10.11	(3) and (5)	Installation of accumulators	No R	1.1.1985	N.R.C.	
	(3), 3rd sentence	Ventilation of service rooms and cupboard to the open deck	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(12)	Charging devices and their charge rate	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(13)	Automatic charging devices	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(14)	Maximum charging voltage	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(15)	European Standards EN 62619 and EN 62620 for lithium-ion accumulators	R, no R	7.10.2018	Lithium-ion accumulators installed before 7.10.2018 shall comply with the requirements of European Standards EN 62619 and EN 62620 at the latest on renewal of the inland navigation vessel certificate after	1.1.2028
	(16)	Accumulator management system	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
10.12	(1)	Switchboards	R, no R	1.7.1983	N.R.C, if the craft complies with the following requirements: a) The materials used in the construction of switchboards shall be of adequate mechanical strength, durable and fireproof. They shall not be hygroscopic. b) Where the voltage exceeds 50 V: aa) switchboards shall be used in which live parts are arranged or protected so as to prevent accidental contact; bb) an insulating mat or an impregnated wooden grating shall be provided; however, this does not apply to divisional switchboards; cc) the metal parts of the frames or chassis of control panels and the metal casings of apparatus shall be carefully earthed.	

Article, paragraph, sentence (To what we deviate)	*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
				c) All parts, including connections, must be easily accessible for inspection, maintenance or replacement and shall be capable of being de-energised. d) Marker plates for all circuits or branches shall be affixed to the switchboards, indicating the circuit.	
(1), (2), (3)(a) and (4)	Switchgear and controlgear	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
(2)(a), 4th sentence	Circuit-breaker with thermal release	R, no R	1.7.1983	N.R.C.	
(2)(b) to (f)	Switches, protective devices	R	1.7.1983	N.R.C., if the craft complies with the following requirements: a) It shall be possible to de-energise the entire installation, the connections to the main switchboard and the feeders to the distribution boards by means of switches or circuit-breakers which simultaneously disconnect all live conductors. b) All switches and sockets shall simultaneously de-energise all conductors. With the exception of lighting in damp rooms, exceptions may be made for lighting switches rated at less than 10 amperes.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
					c) The opening and closing positions of the circuit shall be repeated on the switchgear. This requirement does not apply to light switches rated at less than 10 amperes. d) Appliances requiring a current of more than 10 amperes shall be connected to a special circuit.	
	(2)	Switches, protective devices	No R	1.1.1985	N.R.C.	
	(3)	Measuring and monitoring devices	R, no R	1.7.1983	N.R.C.	
	(3)(b), 1st sentence	Device for monitoring insulation equipped with an optical and acoustic alarm	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(4)(b)	Cupboards and wall recesses in which unprotected switching devices are installed	R, no R	1.7.1983	N.R.C.	
10.13		Emergency circuit-breaker devices	R, no R	1.7.1983	N.R.C.	
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
10.14	(3)	Simultaneous switching	No R	1.1.1985	N.R.C.	
	(3), 2nd sentence	Prohibition of single pole switches in laundries, washrooms and other rooms with wet facilities	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(4)	Locking the sockets	R, no R	1.7.1983	N.R.C.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
10.15		Cables, insulated cables and cable systems	No R	1.1.1985	N.R.C.	
	(1), 3rd sentence, (2) to (5), (8) to (14)	Cables, insulated cables and cable systems	R	1.7.1983	N.R.C.	
	(2)	Minimum cross-section per conductor of 1.5 mm²	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(10)	Cables connected to elevating wheelhouses	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(11)	Cable harness penetrations	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(12)	Cables from an emergency electrical power source to consumer equipment	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(13)	Running of cables through areas with high ambient temperatures	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(14)	Installation of main and emergency power supply cables	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
10.16	(3), 1st sentence	Second circuit for lighting appliances	No R	1.1.1985	N.R.C.	
	(3), 2nd sentence	Second circuit for rooms where cooling machinery, hydraulic machinery or electric motors are installed	R, no R	1.7.1983	N.R.C.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
10.17		Navigation lights	No R	1.1.1985	N.R.C.	
	(4)	Several signal lamps forming a functional unit	R	1.7.1983	N.R.C.	
10.18		Power electronics	R, no R	1.7.1983	N.R.C.	
	(1)	Device for disconnecting from the mains	R, No R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after Legacy protection systems may remain in use if it is confirmed by an expert that they afford comparable protection	1.1.2025
	(2)	Accessibility	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(3)	Galvanic separation of control and power circuits	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(4)	Safe operation with voltage and frequency variations	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2022
	(5)	Discharge time when disconnected from mains	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(6)	Response upon failure of external control signals	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2022

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(7)	Response upon failure of control voltages	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2022
	(8)	Error detection and prevention of undetected errors	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2022
	(9)	Monitoring	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2022
	(10)	Type examination	R, no R	7.10.2018	N.R.C.	
10.19		Alarm and safety systems for mechanical installations	R, no R	1.7.1983	N.R.C.	
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
10.21		Electromagnetic compatibility	R, no R	1.7.1983	N.R.C.	
			R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
CHAPTER 11						
		Electric propulsion systems	R, no R	1.1.2026	Electric propulsion systems installed between 1.1.2020 and 1.1.2026, shall comply at least with the Chapter 11 in ES-TRIN 2019/1. For electric propulsion systems installed before 1.1.2020, the provisions below apply.	
11.01	(2)(a)	Appropriate number of electrical power sources	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2048
	(4)	Two electric propulsion systems deemed independent	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2048
11.03	(3)	Insulation of the windings	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2048
11.04	(3)	Steerageway under vessel's own power	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2048
11.05		Monitoring equipment	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2048
11.06	(2)	Connecting consumer equipment and electric propulsion engines	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.20**68**

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(3)	Propulsion asymmetry	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.20**68**
11.07	(5)	Selective switch-off when protective devices are triggered	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2048
	(6)	Protection against undervoltage	R, no R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2048
11.08	(1) and (2)	Testing of the electric propulsion systems	R, no R	1.1.2020	N.R.C**.**	
	(2), penultimate sentence	Power management during load variations	R, no R	1.1.2028	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
		CHAPTER 12				
		Electronic equipment, systems and networks	R, no R	1.7.1983	N.R.C**.**	
			R, no R	1.1.2028	Electronic equipment, systems and networks installed before 1.1.2028 shall only comply with the requirements of Articles 12.06 and 12.07(4) and (5).	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			R	1.1.1995	Electronic equipment, systems and networks installed before 1.1.1995 shall only comply with the requirements of Articles 12.06 and 12.07(4) and (5) at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	Electronic equipment, systems and networks installed before 30.12.2008 shall only comply with the requirements of Articles 12.06 and 12.07(4) and (5) at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
CHAPTER 13						
13.01	(1)	Mass of bow anchors	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2049
	(3)	Mass of stern anchors	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2049
	(4)	Mass of stern anchors for vessels intended to propel rigid convoys	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2049
	(9)	Anchor windlasses for anchors having a mass in excess of 50 kg	No R	1.1.1985	N.R.C.	
	(11)	Breaking load of anchor chains	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2049
13.02	(3)(a)	Certificate for mooring cables*	No R	30.12.2008	First cable to be replaced on the vessel: N.R.C., at the latest after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
					Second and third cables to be replaced on the vessel: N.R.C., at the latest after	1.1.2030
13.03	(1)	Application of the European Standards to portable fire extinguishers	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(2), 2nd sentence	Suitability for Class A, B and C fires	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(2), 3rd sentence	Aqueous film forming foam agent (AFFF)	R, no R	1.1.2028	N.R.C., at latest by	31.12.2030
	(4), 2nd sentence	Relation of CO_2 content and size of room	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
13.04		Permanently installed fire-fighting systems in accommodation spaces, wheelhouses and passenger rooms	R	1.4.2002	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
13.05	(2)(a)	Combustion air for the propulsion engines	R	1.10.1980	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(2)(b), (d) and (e)	Automatic switch off of the forced ventilation, air escaping from pressure relief valves, over- or under-pressure	R	31.03.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(2)(f)	Facilities for extracting the extinguishing agent and the combustion gases	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(2)(f), 2nd sentence	Operation of facilities from positions outside the protected rooms	R	31.03.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
	(3)	Fire alarm system	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(4)	Piping system	R	31.03.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(5)(a) and (c)	Triggering device	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(5)(c) 6th sentence	The 'fire-fighting installation' symbol as shown in Annex 4	R, no R	1.1.2028	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(5)(d), (e) 2nd sentence, (f)	Triggering device	R	31.03.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(6)(e)	Warning system	R	31.03.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(7)(b)	Pressure tanks installed in accordance with the manufacturer's instructions	R	31.03.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(7)(c) to (e)	Pressure tanks	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(8)	Quantity of extinguishing agent	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(9)(a), (b)(aa), (bb), (cc), (c)	Installation, inspection and documentation	R	31.03.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(10)(c) and (d)	Concentration and volume of CO_2 for the room to be protected	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(10)(e)(f)	Separate control for container valves, 20 seconds warning signal before CO_2 is released	R	31.03.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
13.06		Permanently installed firefighting systems for protecting objects	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
13.07	(1)	Application of the European Standard EN 1914 to ship's boats	R	1.10.2003	N.R.C., at the latest on renewal of the inland navigation vessel certificate after For ship's boats which were on board before 1.10.2003, proof may be provided alternatively that they comply with the safety requirements of Article 32.03.	1.1.2020
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after For ship's boats which were on board before 1.1.2009, proof may be provided alternatively that they comply with the safety requirements of Article 32.03.	1.1.2029
			No R	1.1.1985	N.R.C.	
13.08	(1)	Conformity of lifebuoys with EN 14144, SOLAS or LSA-Code*	No R	1.1.1985	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(2)	Conformity of lifejackets with Regulation 2016/425 or LSA-Code*	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
					Life jackets which have been on board on 29.12.2008 may be used until the renewal of the inland navigation vessel certificate after	1.1.2025

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			No R	1.1.1985	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
CHAPTER 14						
14.02	(4)	Equipping of the outer edges of decks, side decks and other work areas	R, no R	1.12.2011	N.R.C. However at the latest on renewal of the inland navigation vessel certificate after 1.1.2015, the craft must comply with the following requirements: - The outer edges of the decks, as well as work areas where persons might fall more than 1 m, shall be fitted with bulwarks or coamings that are at least 0,70 m height or with continuous guard rails in accordance with European Standard EN 711 : 2024, comprising a handrail, intermediate rail at knee height and foot rail; and - Side decks shall be fitted with a foot rail and continuous handrail that is secured to the coaming. Coaming handrails shall not be required where side decks are fitted with non-retractable shipside guard rails.	
14.04	(1)	Clear width of side decks	R	31.12.1994	For vessels of $B \leq 7{,}30\ m$: N.R.C. For vessels of $L < 55\ m$ in length with stern accommodation only, N.R.C. Should the entire hold area be replaced, the requirements of Article 14.04 must be complied with. In the event of modifications affecting the entire length of the side deck area and modifying the clear width of the side deck,	

Article, paragraph, sentence (To what we deviate)	*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
				a) Article 14.04 must be complied with when the clear width of the side deck to a height of 0,90 m, available before the modification, has to be reduced b) the clear width of the side deck to a height of 0,90 m or the clear width above that height, available before the modification, must not be reduced if their dimensions are less than those specified in Article 14.04.	
		R	31.12.1994	For all other vessels: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			No R	30.12.2008	For vessels of $B \leq 7{,}30\ m$: N.R.C. For vessels of $L < 55\ m$ in length with stern accommodation only, N.R.C. Should the entire hold area be replaced, the requirements of Article 14.04 must be complied with. In the event of modifications affecting the entire length of the side deck area and modifying the clear width of the side deck, a) Article 14.04 must be complied with when the clear width of the side deck to a height of 0,90 m, available before the modification, has to be reduced b) the clear width of the side deck to a height of 0,90 m or the clear width above that height, available before the modification, must not be reduced if their dimensions are less than those specified in Article 14.04.	
			No R	30.12.2008	For all other vessels: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
14.05	(1)	Access to work stations	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(4)	Stairs in work stations which are manned continuously	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
14.06	(2)	Exits and emergency exits	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
14.07	(1), 2nd sentence	Ladders, steps and similar devices	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
14.10		Hatch covers	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
14.11		Winches	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
	(2)	Hand-operated winches	No R	1.1.1985	N.R.C.	
14.12	(2)	Manufacturer's plate	R	31.12.1994	N.R.C.	
			No R	30.12.2008	N.R.C.	

Article, paragraph, sentence (To what we deviate)	*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
(3)	Maximum permissible loadings	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
(4), 1st sentence	Devices to protect against crushing or shearing hazards	R, no R	1.12.2011	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2020
		No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
(4), 2nd sentence	Safety clearance	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after Should this provision not be achievable in practice after this date has expired, locations within work areas and passageways where the safety clearance is less than 0,50 m must be clearly marked as such.	1.1.2020
		R, no R	1.12.2011	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2020
		No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after Should this provision not be achievable in practice after this date has expired, locations within workstations and passageways where the safety clearance is less than 0,50 m must be clearly marked as such.	1.1.2030

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(5)	Safety in operation	R, no R	1.12.2011	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2020
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(6)	Expert inspection	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(8)	Cranes which shall meet the requirements of one of the Member States	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
	(9)	Operating instructions	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after If, after this date, operating instructions can no longer be obtained from the manufacturer, they will be written by a specialist. Thereafter, as of the first test in accordance with Article 14.12(6)(c), these operating instructions will be approved by the expert conducting this test.	1.1.2020
			R, no R	1.12.2011	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2020
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after If, after this date, operating instructions can no longer be obtained from the manufacturer, they will be written by a specialist. Thereafter, as of the first test in accordance with Article 14.12(6)(c), these	1.1.2030

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
					operating instructions will be approved by the expert conducting this test.	
CHAPTER 15						
15.01	(1)	Accommodation for the persons lodging habitually on board	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
15.02	(3)	Floors below the plane of maximum draught	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(4)	Second/Emergency exit in communal living quarters and sleeping cabins	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(5)	Noise and vibration in accommodations	No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
			R, no R	1.4.1976	On renewal of the inland navigation vessel certificate after Where the prescribed limit value is not complied with after that date, the inland navigation vessel certificate may be renewed only if one of the two alternatives below is complied with.	1.1.2020

Article, paragraph, sentence (To what we deviate)	*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*
				Alternative 1: a) The applicant can demonstrate to the satisfaction of the inspection body that he has done what reasonably can be expected of him to reduce the noise level in the accommodations in question; b) The remaining exceedance of the limit value does not exceed: - 5 dB(A) in living quarters; - 10 dB(A) in sleeping quarters, and c) Appropriate individual acoustic protection devices shall be available in rooms where the limit values are exceeded. If it is not possible to reduce the noise level throughout the sleeping quarters below the limit value as set out in (b), it is permissible to further reduce the ambient noise using local noise reduction measures, such as noise cancellation. This is subject to the provision that the ambient noise shall fall below the limit value as set out in (b). (c) shall apply mutatis mutandis. Alternative 2: The craft can continue its operating mode if monitoring by a tachograph ensures that the craft,

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
					at least for the rest periods prescribed by the Member States' domestic provisions; is operated at a main engine rpm at which the noise limit values in the sleeping quarters does not exceed 60 dB(A). This rpm value will be ascertained by trials upon first renewal of the inland navigation vessel certificate after 1.1.2020 and entered in the inland navigation vessel certificate.	
	(6)	Headroom in accommodations	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(8)	Free floor area of communal living quarters	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(9)	Cubic capacity of living quarters and sleeping cabins	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(10), 1st and 2nd sentences	Volume of airspace per person	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(11)(a)	Size of door openings	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(11)(c)	Doors which are located along escape routes	R, no R	1.1.2022	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2052
	(11)(d)	Doors which are locked from the inside	R, no R	1.1.2022	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2027
	(12)(a) and (b)	Depths and widths of stairs	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
	(13)	Pipes carrying dangerous gases or liquids	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			No R	1.1.1985	N.R.C.	
15.03		Sanitary installations	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
15.04		Galleys	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
15.05	(1), 2nd sentence	Filler neck of the potable water tanks	R, no R	1.01.2026	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
15.06		Heating and ventilation	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
15.07	(1), 2nd sentence	Dimensions of berths	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
CHAPTER 18						
18.01	(2), Tables 1 and 2, and (7)	Limit/control values and type-approval	R	1.12.2011	N.R.C., as long as a) the limit and control values do not exceed the double values according to values of step II, b) the on-board sewage treatment plant has a manufacturer's or expert's certificate confirming that it can cope with the typical loading patterns on board the craft.	
			No R	10.01.2013	N.R.C., as long as a) the limit and control values do not exceed the double values according to values of step II, b) the on-board sewage treatment plant has a manufacturer's or expert's certificate confirming that it can cope with the typical loading patterns on board the craft.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
			R, no R	7.10.2018	On-board sewage treatment plants which have received an approval on or after 1st December 2011, pursuant to requirements of the Resolution CCNR 2010-II-27 (Step II), may continue to be installed and used. On-board sewage treatment plants which have received an approval on or after 10 January 2013, pursuant to requirements of the Directive 2012/49/EU (Step II), may continue to be installed and used.	
	(9)	Sampling point	R, no R	1.1.2026	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
18.11		Operation management manual	R, no R	1.1.2026	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
CHAPTER 19						
Chapter 19 (except Articles 19.01(5) and (6), 19.05(4), 19.08(10), 19.13, 19.14(1) and (2))		Passenger vessels	No R	30.12.2008	The requirements do not apply to passenger vessels which benefit from derogations that may have been granted under Article 29(1)(2) of Directive (EU) 2016/1629.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
19.01	(2)(d)	Prohibition of solid fuel heating appliances and boilers according to Article 16.07	R	31.12.1994	The requirement does not apply to craft with solid fuel engines (steam engines).	
	(2)(e)	Prohibition of liquefied gas devices according to Chapter 17	R	1.1.2006	When the liquefied gas installations are fitted with suitable gas warning equipment in accordance with Article 19.15(8): N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(4), 2nd and 3rd sentences	Minimum number of seats and minimum number of cabins	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate after However, cabin vessels which have been laid down after 1.1.2006 must have a minimum of one cabin designed for persons with reduced mobility.	1.1.2064
	(5)	Obstructed vision ahead of the vessel	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(6)	Auxiliary means when no sufficiently unobstructed view is provided towards the rear	R, no R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
19.02	(1a)	Materials other than steel, such as aluminium alloy or Fibre Reinforced Plastic composites	R, no R	1.1.2024	N.R.C.	
	(2)	Number and position of bulkheads	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(3)	Positioning of aft-peak bulkhead*	R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after This requirement does not apply to passenger vessels that, due to the compliance with the requirements for the two-compartment status set out in Article 19.03(9) or with the requirements of Article 19.07, achieve an equivalent level of safety and manoeuvrability.	1.1.2035
		Positioning of collision bulkhead*	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(5), 1st sentence	Bulkheads, which are taken into account in the damage stability calculation	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(5), 2nd sentence	Margin line if no bulkhead deck	R	1.1.1996	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(6), 1st sentence	Number of openings in the bulkheads	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(7) to (10)	Requirements for bulkheads	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(10)(d)	Optical and acoustic signal*	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(11)	Doors in bulkheads which are taken into account in the damage stability calculation	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(13)	Open-ended piping and ventilation ducts	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(15)	Height of double bottoms, width of double sides	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(16)	Windows below the margin line	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
19.03	(1) to (6)	Intact stability	R	1.1.2006	N.R.C. and when the maximum number of passengers is raised, at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(1)(a)	Heeling test	R	1.1.2024	N.R.C. Heeling test not in accordance with Annex 1 of IMO Resolution MSC.267(85) are accepted.	
	(6), last sentence	Passenger vessel capable of achieving greater speeds than $v = 0{,}4\sqrt{\mathrm{gL}}$	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2064
	(7)	Damage stability	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(8)	Buoyancy of the vessel in the event of flooding and proof of sufficient stability	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(9)	Damage stability (one-compartment status)*	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
		Vertical extent of damage to the bottom of the vessel*	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
			R	31.12.2005	For vessels with watertight decks on a minimum distance of 0,50 m and less than 0,60 m of the bottom: N.R.C.	
		Damage stability (two-compartment status)*	R	1.1.2006	N.R.C.	
	(10)	Criteria for all intermediate stages of flooding	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(11)	Criteria for the final stage of flooding	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(12)	Marking of watertight shut-off devices	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(13)	Cross-flood openings (if provided)	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(14)	Entry in the inland navigation vessel certificate	R, no R	1.1.2028	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
19.04		Safety clearance and freeboard	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
19.05		Maximum permitted number of passengers	R	1.4.1976	At the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(2)(a)	Number of passengers for whom the existence of a muster area according to Article 19.06(8) has been proven	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(2)(b)	Number of passengers that has been taken into account for the stability calculation according to Article 19.03	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(4)	Maximum permitted number of passengers displayed on the safety plan*	R, no R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
19.06	(1), 1st sentence (a)	Passenger rooms on all decks forward of the aft-peak bulkhead, if they are below the bulkhead deck*	R	7.10.2018	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
		Passenger rooms on all decks aft of the level of the collision bulkhead*	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(3)(a) to (e)	Number and width of the exits of passenger rooms	R	30.09.1984	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(3)(a), 1st sentence	Two exits which are as far apart from one another as possible	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2064
	(3)(c), 1st sentence	Clear height of exits*	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)	*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
(3)(c), 2nd sentence	Clear width of doors of passenger cabins and other small rooms	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
(3)(f), 1st sentence	Size of emergency exits	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
(3)(g)	Clear width of exits of rooms intended for use by persons with reduced mobility	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
(4)(d)	Doors intended for use by persons with reduced mobility	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
(5)	Connecting corridors	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
(6)(b)	Escape routes to muster areas	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
(6)(c)	No escape routes through galleys*	R	1.1.2020	N.R.C., at the latest on renewal of the inland navigation vessel certificate after Where an alternative escape route avoiding the galley cannot technically be implemented or its application imposes disproportionate costs, the inland navigation vessel certificate may be renewed only if: a) the risks associated with the escape route through the galley have been analysed, and	1.1.2020

Article, paragraph, sentence (To what we deviate)	*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
				b) the recommendations in accordance with this limited risk analysis have been implemented, to the satisfaction of the inspection body, in the galley. This limited risk analysis shall at least address the following: a) the accessibility of the escape route; b) fire hazards; c) risks from hot surfaces; d) slip and trip hazards on galley floors; e) specific hazards for certain target groups such as persons with reduced mobility.	
(6)(d)	No rungs, ladders or the like installed along the escape routes	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
(8)	Muster and evacuation areas	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
		R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
(9)	Stairs and their landings in the passenger areas	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
(9)(a), (b), (c), (e), and last sentence	Stairs and their landings in the passenger areas	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(9)(b)	Sum of the widths of all stairs	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(9)(c)	Handrails	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(9)(e)(aa)	Gradient of stairs	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2064
	(9)(e)(cc)	Stairs straight and parallel to the longitudinal axis of the vessel	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(10), 1st sentence	Railing according to European Standard	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(10), 2nd sentence	Height of bulwarks and railings of decks intended for use by persons with reduced mobility	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(12)(c), 1st sentence	Clear width of openings used normally for the embarking or disembarking of persons with reduced mobility	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(12)(c) 2nd sentence	Equipment to enable persons to be transferred	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(13)	Passageways and walls in passageways intended for use by persons with reduced mobility	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(14), 1st sentence	Design of glass doors and walls in passageways and window panes	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(15)	Superstructures and their substructures consisting entirely of panoramic panes, shelters or similar mobile installations	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(17), 2nd and 3rd sentences	Toilets fitted for use by persons with reduced mobility	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2064
	(18)	Ventilation system for cabins without an opening window	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(19)	Requirements of Article 19.06 for rooms in which crew members or shipboard personnel are accommodated	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
19.07	(2)	Second independent propulsion system in a separate engine room or electrical service room	R	1.1.2020	N.R.C. for passenger vessels that satisfy the following requirements: a) The existing firefighting system referred to in Article 19.12(9) to protect the engine room can be triggered immediately without danger to people located in the engine room. The transitional provision to Article 13.05(2)(a) cannot be invoked. If the existing firefighting system cannot be triggered immediately without danger to people located in the engine room as described above, the combustion engines in the engine room are protected with additional firefighting system for object protection, which can be triggered immediately without danger to people located in the engine room. b) A firefighting system for object protection in accordance with Article 13.06, which can be triggered immediately without danger to people located in the engine room, is required for: - the enclosed combustion engines; - the enclosed generators; - the main switchboard. c) The firefighting systems for object protection referred to in (a) and (b) must be designed by a specialised firm. Furthermore, the requirements of Article 13.05(9) apply *mutatis mutandis*. d) In addition to the bilge systems referred to in Article 8.08, the engine room is equipped with an additional bilge pump.	

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
					Its pumping capacity (Q) in l/min is calculated by $Q = {d_2}^2$. d_2 is to be calculated in accordance with section 8.08(3) and the maximum length of the engine room is to be used for "I". The bilge pump must be located in the secure area. It must be possible to switch on the pump and operate the pressure valves from above the main deck. e) The total pump capacity of all pumps located in this engine room and capable of being used for pumping out must be at least 3000 l/min. f) (d) and (e) are not required if the main engines are located above the damage waterline in the event of flooding in the engine room.	
19.08	(8), last sentence	Independent ventilation system for rooms with CO_2 bar systems	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2044
19.10	(4), (6), (7), (8) and (11)	Emergency power plant	R	1.4.1976	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
19.11	(1)	Suitability for fire protection of materials and components	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
			R, no R	7.10.2018	For materials and components approved according to the International Code for the Application of Fire Test Procedures (FTP code) adopted under Resolution MSC.61(67)[1]: N.R.C.	
	(2)	Design of partitions	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
			R	1.1.2024	For electrical service rooms: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2044
	(3), 1st sentence	Paints, lacquers and other surface treatment products as well as deck coverings used in rooms except engine rooms and store rooms shall be flame-retardant	R	1.4.1976	For day-trip vessels: N.R.C., at the latest on renewal of the inland navigation vessel certificate after The vessels must satisfy the following conditions: Paints, varnishes, coatings and other materials used on surfaces facing escape routes and other materials for the surface treatment of panels must - be flame-retardant and - not produce smoke or toxic vapours to any dangerous extent.	1.1.2045

[1] MSC.61(67) adopted on 5 December 1996 - International Code for Application of Fire Test Procedures.

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(4)	Lounge ceilings and wall claddings manufactured from non-combustible materials	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(5)	Furniture and fittings in muster areas manufactured from non-combustible materials	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(6)	None of the exposed surfaces shall produce excessive amount of smoke or toxic substances	R	1.4.1976	For day-trip vessels: N.R.C., at the latest on renewal of the inland navigation vessel certificate after The vessels must satisfy the following conditions: Paints, varnishes, coatings and other materials used on surfaces facing escape routes and other materials for the surface treatment of panels must - be flame-retardant and - not produce smoke or toxic vapours to any dangerous extent.	1.1.2045
			R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(7)	Insulation materials in lounges	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(9)	Requirements for doors in partitions	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(9)(a), (b), (c) 2nd sentence and (d)		R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(11)	Partitions	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(12)	Draught stops	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(13)	Stairs made of steel or another equivalent non-combustible material	R	1.4.1976	For day-trip vessels: N.R.C., at the latest on renewal of the inland navigation vessel certificate after The vessels must satisfy the following conditions: It is sufficient if, instead of stairs in the form of a load-bearing steel assembly, the stairs serving as an escape route are designed in such a way that they remain useable, in the event of a fire, for about the same time as stairs in the form of a load-bearing steel assembly.	1.1.2045
			R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(14)	Internal stairs encapsulated at all levels by walls according to Article 19.11(2)	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(15)	Ventilation systems and air supply systems	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(16)	Ventilation systems in galleys and stoves with extractors	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(16), 2nd sentence	Stoves and similar cooking appliances*	R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
	(17)	Control centres, stairwells, internal muster areas fitted with smoke extraction systems	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
19.12	(3)(a)	Single hose length of not more than 20 m*	R	30.09.1984	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
	(8)(d)	Installation of fire extinguishing pumps forward of the aft-peak bulkhead	R	31.12.1994	Both pumps: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
19.13		Safety organisation	R, no R	1.1.2024	N.R.C., at the latest on renewal of the inland navigation vessel certificate.	
19.14	(1)	Equipment with waste water collection tanks or on-board sewage treatment plants	R	1.1.2006	For cabin vessels with no more than 50 sleeping berths and for day-trip vessels: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(2)	Requirements for waste water collection tanks	R	1.1.2006	For cabin vessels with no more than 50 sleeping berths and for day-trip vessels with no more than 50 passengers: N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
19.15	(1)	Damage stability for passenger vessels of less than 50 passengers and with a length L_{WL} of not more than 25 m	R	1.1.2006	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2045
		CHAPTER 20				
		Passenger sailing vessels	No R	30.12.2008	The requirements do not apply to passenger sailing vessels which benefit from derogations that may have been granted under Article 29(1)(2) of Directive (EU) 2016/1629.	
		CHAPTER 21				
21.01	(2)	Special winches or equivalent coupling devices to be used for pushing purposes	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
	(3), last sentence	Requirements for drive units	R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2050
CHAPTER 22						
		Floating equipment	No R	30.12.2008	The requirements do not apply to floating equipment which benefits from derogations that may have been granted under Article 29(1)(2) of Directive (EU) 2016/1629.	
CHAPTER 26						
		Recreational craft	No R	30.12.2008	The requirements do not apply to recreational craft which benefits from derogations that may have been granted under Article 29(1)(2) of Directive (EU) 2016/1629.	
			R	31.12.1994	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2035

Article, paragraph, sentence (To what we deviate)		*Subject (Reminder of the original requirement, however if the symbol * is used, it defines the scope of the derogation)*	*Rhine / no Rhine*	*First certificate issued before*	*Deadline and comments*	
CHAPTER 29						
29.02	(3)	Second independent steering apparatus drive unit or a manually operated drive unit comes into operation without time delay	R	1.4.2005	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2025
			No R	30.12.2008	N.R.C., at the latest on renewal of the inland navigation vessel certificate after	1.1.2030
CHAPTER 30						
30.02	(2), 2nd sentence	Gaseous or particulate pollutants of engines with low flash point fuels	R, no R	1.1.2024	For engines complying with the type-approval and installation provisions in force at the date of installation: N.R.C.	

Article 32.02
Reference to European or international standards

Where a provision of this Standard refers to a European or international standard with regard to structural requirements

a) pertaining to free-standing items of equipment, such items of equipment may, after any new publication or revision of the Standard, continue to be used for a further 20 years following the new publication or the revision of this Standard,

b) pertaining to permanently installed equipment parts, equipment parts may continue to be used until they are replaced or the areas in question have been converted.

Article 32.03
Ship's boats on board craft which are already in service

1. Ship's boats which were on board

   a) before 1.10.2003 for craft navigating on the Rhine,

   b) before 1.01.2009 for craft operating exclusively on waterways outside the Rhine,

   shall be included in the list of ship's boats for the inland navigation published by the CESNI, or be compliant with the conditions specified in (2).

2. Ship's boats shall at least meet the following conditions:

   a) The ship's boat must be made of appropriate materials. Ship's boats made of a synthetic material must not exhibit any signs of deterioration.

   b) The product of $L_B \cdot B_B \cdot H_B$ shall be at least 2,7 m³.

   c) The ship's boat must possess seating for the maximum permitted number of occupants and be able to manoeuvre safely with this number of occupants on board.

   d) The freeboard of a ship's boat with the maximum permitted number of occupants on board must be equal to or greater than 25 cm.

   e) The residual buoyancy in kn of the flooded unmanned craft must be at least $0{,}3 \cdot L_B \cdot B_B \cdot H_B$.

      The ship's boat must have an upright floating position in all loading conditions.

   f) The ship's boat must be fitted with appropriate equipment (two oars, a bailer, a mooring line, a rescue line, two thole pins, towing eye and lifting attachment).

   g) The ship's boat shall be fitted with a drainage device made of corrosion-resistant material that can be quickly and securely closed at any time. The plug shall be permanently attached to the ship's boat.

   h) All accessible parts of the ship's boat must be slip-resistant.

   i) When the board cannot be grasped or if the freeboard of the empty ship's boat exceeds 30 cm, the ship's boat must be equipped with ropes or handholds so that someone in the water can hold on to it.

   j) The ship's boat shall be provided on both sides with a retroreflective strip at least 0,1 m wide and 1 m long.

   k) A signboard in the ship's boat must be affixed according to Annex 4, Figure 10.

l) For conditions (b) and (e):

L_B: Length of the ship's boat in m;

B_B: Breadth of the ship's boat in m;

H_B: Height of the ship's boat's sides in m.

Compliance of the ship's boat with these conditions shall be confirmed by an expert and the conditions c and e shall be verified by practical tests in standing water.

3. Ship's boats according to (1) must be marked by a metal plate according to the following pattern:

Ship's boat:	
UNIQUE EUROPEAN VESSEL IDENTIFICATION NUMBER:	.....
NUMBER OF RHINE VESSEL INSPECTION CERTIFICATE / UNION CERTIFICATE FOR INLAND NAVIGATION VESSELS:	.....
INSPECTION BODY:	.....

The indication on the metal plate must be confirmed by a vessel inspection body by the fact that its mark is stamped on the metal plate."

72. Chapter 33 is deleted.

73. Annex 2, Section A, item 9, is worded as follows:

"9. Water d~~D~~isplacement as defined in Article 1.01 (4.7) (Annex 3, Section I, item 21 and Section VI, 13th column) for vessels other than cargo vessels"

74. Annex 3 is amended as follows:

a) Section I, item 21 is worded as follows:

"21. Dead weight/Water ~~D~~displacement *)

t/m3*)"

b) Section I, item 44 is worded as follows:

“

44. Life saving appliances

Number of lifebuoys.…., of which with light....., with line.....*)

One lifejacket for every person who is regularly on board /in accordance with Article 13.08(2)*)

A ship's boat with a set of oars, one mooring line and a bailer / in accordance with the European Standard*)

Platform or an installation in accordance with Article 19.15(4) or (5)*)

Number, type and site(s) of installation of the equipment to enable persons to be transferred safely to shallow water, to the bank or to another craft in accordance with Article 19.09(3) .....

.....

.....

Number of individual life-saving equipment for shipboard personnel ....., of which in accordance with Article 13.08(2) ..... *)

Number of individual life-saving equipment for passengers..... *)

Collective life-saving equipment, with respect to the number, equivalent to…..... individual life-saving equipment*)

Two breathing apparatus sets, two sets of equipment, number of …….. ~~smoke~~escape hoods*)

Safety rota and safety plan displayed at: .....

.....

.....

”

c) Section I, item 47 (concerns only the German version)

d) Section I, item 48 (concerns only the German version)

e) Section I, item 52 (concerns only the German and Dutch version)

f) Section II, (6.1) to (6.3) is worded as follows:

"

6.1	[The vessel is accepted for operating mode [A1*), A2*), B*) / Heading referring to the operating modes in accordance with national and international requirements].
6.2	Vessel equipment in accordance with Article 31.01. The vessel complies*) / does not comply*) with Article 31.02 (Standard S1)*) / Article 31.03 (Standard S2)*). [In accordance with Article 19.05 of the Regulations for Rhine navigation personnel / In accordance with national or international requirements], the minimum crew needs to be increased as follows*) / does not need to be increased*):

	Operating modes[3]		
	.....	.....	.....
	.....	.....	.....

Observations and special conditions:
.....
.....

6.3	Minimum crew [according to Article 19.06 of the Regulations for Rhine navigation personnel / in accordance with national or international requirements]: ....

"

g) Section III, Title and 1st row of text in the 2nd row of the table (concerns only the Dutch version)

h) Section VI, "right-hand page", table, 1st row, 1st column, is worded as follows:

"Deadweight according to measurement certificate or water displacement*)"

"*) If no measurement certificate is available, estimate the deadweight or water displacement."

[3] The Rhine inspection certificate will refer to: boatman, boatman replaced by an able boatman; operating modes A1, A2 and B.

75. Annex 4 is worded as follows:

"***ANNEX 4***
SAFETY SIGNS

Figure 1 No entry for unauthorised persons		Colour: red / white / black
Figure 2 Fire, naked flame and smoking prohibited		Colour: red / white / black
Figure 3 Fire extinguisher		Colour: red / white
Figure 4 General danger warning		Colour: black / yellow

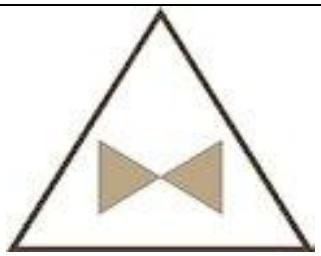
Figure 5 Extinguisher hose		Colour: red / white
Figure 6 Remote release station		Colour: red / white
Figure 7 Wear acoustic protection device		Colour: blue / white
Figure 8 First-aid kit		Colour: green / white
Figure 9 Quick-closing valve on the tank		Colour: brown / white

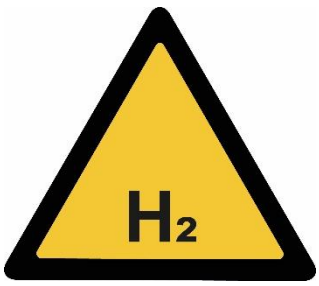
Figure 10 Wear life jacket		Colour: blue / white
Figure 11 LNG warning		Colour: black / yellow
Figure 12 Automated external defibrillator		Colour: white/green
Figure 13 Warning for areas where explosive atmospheres may occur		Colour: black / yellow
Figure 14 Hydrogen warning		Colour: black / yellow

Figure 15 Methanol warning		Colour: black / yellow

The symbols actually used may slightly differ from or be more detailed than the graphical representations in this Annex, provided the meaning is not changed and differences and modifications do not render the meaning incomprehensible.”

76. Annex 5 is amended as follows:

ANNEX 5
NAVIGATION, INFORMATION AND SPECIAL EQUIPMENT

Contents

Section I Definitions and procedural provisions for navigation, information and special equipment
- Chapter 1 Definitions
- Chapter 2 Type test and type-approval
- Chapter 3 Installation and performance tests
- Appendix Installation and performance certificate

Section II Navigational radar installations
- Chapter 1 Minimum requirements and conditions for testing conformity with these minimum requirements
- Appendix Inland ECDIS equipment, standalone equipment connected to the navigational radar installation
- Chapter 2 Installation and performance tests

Section III Rate-of-turn indicators
- Chapter 1 Minimum requirements and conditions for testing conformity with these minimum requirements
- Appendix Maximum tolerances for indication errors of rate-of-turn indicators
- Chapter 2 Installation and performance tests

Section IV Inland AIS equipment
- Chapter 1 Minimum requirements and conditions for testing conformity with these minimum requirements
- Chapter 2 Installation and performance tests

Section V Tachographs
- Chapter 1 Minimum requirements and conditions for testing conformity with these minimum requirements
- Chapter 2 Installation and performance tests

Section VI Track Guidance Assistants for Inland Navigation (TGAIN)
- Chapter 1 Minimum requirements and conditions for testing conformity with these minimum requirements
- Chapter 2 Installation and performance tests

Section VII Awareness monitoring systems
- Chapter 1 Minimum requirements and conditions for testing conformity with these minimum requirements
- Chapter 2 Installation and performance tests

Section VIII Rate-of-turn regulators connected to a TGAIN
- Chapter 1 Minimum requirements and conditions for testing conformity with these minimum requirements
- Chapter 2 Installation and performance tests

Section I
Definitions and procedural provisions for navigation, information and special equipment

Chapter 1
Definitions

Article 1.01
Definitions

1. 'Type test' means the test procedure which the testing body uses to test for compliance with the requirements according to this Annex. The type test forms an integral part of the type-approval.

2. 'Type-approval' means the administrative procedure according, by which a Member State confirms that equipment complies with the requirements of this Annex.

3. 'Test certificate' means the document in which the type testing results are laid down.

4. 'Applicant' or 'manufacturer' means any legal or natural person under whose name, trademark or any other form of identification the equipment submitted for testing is manufactured or marketed and who is responsible for all matters as regards the type testing and type-approval procedure in respect of the testing body and the competent authority.

5. 'Testing body' means the institution, authority or organisation that does the type testing.

6. 'Manufacturer's declaration' means the declaration by which a manufacturer gives the assurance that the equipment meets the prevailing minimum requirements and that is identical in every respect to the type submitted for testing.

7. 'Approved specialist firm' means the firms approved by the competent authority for installation, replacement, repair or maintenance of navigation, information and special equipment.

Chapter 2
Type test and type-approval

Article 2.01
Type tests

Compliance with the minimum requirements shall be established by means of a type test.

If the equipment passes the type test, the testing body shall issue a test certificate. If the equipment fails to meet the minimum requirements, the applicant shall be notified in writing of the reasons for its rejection.

Article 2.02

Application for a type test

1. Applications for a type test shall be submitted to a testing body.

2. Each application shall be accompanied at least by the following documents

   a) a detailed technical description;

   b) a complete set of circuit diagrams and service documents;

   c) a detailed operator's manual;

   d) a short operator's manual; and

   e) where applicable, evidence of previously completed tests.

3. By means of tests, the applicant shall establish or have it established that the equipment meets the minimum requirements.

   The results of the test and the measurement reports shall be attached to the application.

4. For navigational radar installations, in case it is not intended by the applicant to have the Declaration of Conformity pursuant to Directive 2014/53/EU, Annex VI, established concurrently with the type-approval, a Declaration of Conformity shall be submitted together with the application for a type test.

Article 2.03

Type-approval

1. Type-approval shall be granted by the competent authority pursuant to the test certificate. Compliance is proven by a type-approval issued by a competent authority.

2. Each competent authority or the testing body designated by the competent authority shall be entitled to select equipment from the production series at any time for inspection.

   If this inspection reveals defects in the equipment, type-approval may be withdrawn.

   The type-approval shall be withdrawn by the authority that issued it.

3. The list of type-approved equipment is published on the CESNI website (https://listes.cesni.eu/).

Article 2.04

Marking of the equipment and type-approval number

1. Each component of the equipment shall be marked indelibly with the name of the manufacturer, the trade designation of the equipment, the type of equipment and the serial number.

2. The type-approval number assigned by the competent authority shall be affixed indelibly to the equipment in such a way that it remains clearly visible after the equipment has been installed.

Composition of a type-approval number: R-NN-NNN or e-NN-NNN

R = Rhine

e = European Union

NN = number for the country of type-approval, where

01	=	Germany	19	=	Romania
02	=	France	20	=	Poland
03	=	Italy	21	=	Portugal
04	=	Netherlands	23	=	Greece
05	=	Sweden	24	=	Ireland
06	=	Belgium	25	=	Croatia
07	=	Hungary	26	=	Slovenia
08	=	Czechia	27	=	Slovakia
09	=	Spain	29	=	Estonia
11	=	United Kingdom	32	=	Latvia
12	=	Austria	34	=	Bulgaria
13	=	Luxembourg	36	=	Lithuania
14	=	Switzerland	49	=	Cyprus
17	=	Finland	50	=	Malta
18	=	Denmark			

NNN = three-digit number, to be determined by the competent authority, according to the following number ranges:

000-049	=	navigational radar installations
050-099	=	rate-of-turn indicators
100-149	=	Inland ECDIS equipment (navigation mode)
150-199	=	future uses
200-499	=	Inland AIS equipment
500-599	=	future uses
600-649	=	tachographs
650-799	=	future uses
800-849	=	track guidance assistants in inland navigation
850-899	=	future uses
900-949	=	awareness monitoring systems
950-999	=	future uses

3. The type-approval number shall be used only in conjunction with the associated type-approval. It shall be the responsibility of the applicant to produce and affix the type-approval number.

Article 2.05
Manufacturer's declaration

Each unit of equipment shall be accompanied by a manufacturer's declaration.

Article 2.06
Modifications to type-approved equipment

1. Any modification made to equipment already approved shall cause the type-approval to be forfeit.

   Whenever modifications are planned, details shall be sent in writing to the competent authority.

2. The competent authority for the type-approval shall decide following consultation with the testing body whether the type-approval still applies or whether an inspection or new type test is necessary.

   If a new type-approval is granted, a new type-approval number shall be assigned.

Chapter 3
Installation and performance tests

Article 3.01
Approved specialist firms

1. The installation, replacement, repair or maintenance of navigation, information and special equipment shall be carried out only by specialist firms approved by the competent authority.

2. Approval may be withdrawn by the competent authority.

3. The tasks under (1) include also the configuration of equipment (including the sensors and actuators for TGAIN).

4. The list of approved specialist firms is published on the CESNI website (https://listes.cesni.eu).

Article 3.02
Installation and performance certificate

1. An installation and performance test shall be carried out by the inspection body or by an approved specialist firm:
   a) before the equipment is put into service for the first time after installation,
   b) on every periodical inspection in order to extend the validity of the inland navigation vessel certificate,
   c) after each modification of the vessel likely to affect the operating conditions of the equipment.

2. After successful completion of installation and performance tests, the inspection body or the approved specialist firm shall issue a certificate based on the model according to the appendix. This certificate shall be kept permanently on board.

3. If the test conditions have not been met, a list of defects shall be drawn up. Any existing certificate shall be withdrawn or sent to the competent authority by the approved specialist firm.

4. For tachographs, the installation and performance certificate is valid for 5 years. It shall also comprise the characteristics of the installation (in particular the location and type of seals and their markings, location and type of monitoring equipment).

Article 3.03

Operator's manual

A detailed operator's manual shall be supplied with equipment. It shall be available at least in Dutch, English, French and German. It shall contain at least the following information:

a) activation and operation;

b) maintenance and servicing;

c) general safety provisions.

For Inland AIS equipment and tachographs, an operator's manual shall be handed over for retention on board. This shall be mentioned on the installation and performance certificate.

Appendix

Installation and performance certificate for navigational radar installations, rate-of-turn indicators, Inland AIS equipment, tachographs, TGAIN, awareness monitoring systems and rate-of-turn regulators connected to a TGAIN

(Model)

Vessel name/type: .....

Unique European vessel identification number: .....

Vessel owner:

Name: .....

Address: .....

Telephone: .....

Navigational radar installations: Number: .....

Item No	Type	Manufacturer	Type-approval number	Serial number

Rate-of-turn indicators: Number: .....

Item No	Type	Manufacturer	Type-approval number	Serial number

Inland AIS equipment:

Item No	Type	Manufacturer	Type-approval number	Serial number

Tachographs

Item No	Type	Manufacturer	Type-approval number	Serial number

Track Guidance Assistant for Inland Navigation (TGAIN)

Item No	Type	Manufacturer	Type-approval number	Serial number

Awareness monitoring systems

Item No	Type	Manufacturer	Type-approval number	Serial number

Rate-of-turn regulators connected to a TGAIN

Item No	Type	Manufacturer	Type-approval number	Serial number

It is hereby certified that the vessel's […], referred to above, comply with the requirements of Annex 5 of the European Standard laying down technical requirements for inland navigation vessels (ES-TRIN) for the installation and performance testing of this equipment.

Approved specialist firm

Name: .....

Address: .....

Telephone: .....

Stamp Place Date

Signature

Competent authority

Name: .....

Address: .....

Telephone: .....

Section II
Navigational radar installations

Article 0.01
Purpose of the navigational radar installation

The navigational radar installations shall facilitate the navigation of the vessel by providing an intelligible radar picture of its position in relation to buoys, shorelines and navigational structures, as well as permitting the reliable and timely recognition of other vessels and obstructions protruding above the surface of the waterway.

Chapter 1
Minimum requirements and conditions for testing conformity with these minimum requirements

Article 1.01
Minimum requirements

1. Navigational radar installations shall meet the requirements of Directive 2014/53/EU[1].

2. Navigational radar installations shall also meet the requirements of the European Standard EN 303 676 : 2021.

3. (2) above does not apply to Inland ECDIS equipment hardware operated in navigation mode in system configuration 2 or 3 in accordance with ES-RIS, Part I, Chapters 1 and 2 if a manufacturer's certificate of conformity is produced. This certificate of conformity must confirm that the hardware:
   a) is designed and manufactured to withstand the typical stresses and environmental conditions prevailing aboard a vessel, without loss of quality or reliability and
   b) does not interfere with the operation of other onboard communication and navigation equipment.

   The first sentence does not apply to visual display units operated in navigation mode in system configuration 3 nor to hardware components used for providing radar information from the radar processor for display on the Inland ECDIS equipment screen.

Article 1.02
Conditions for testing conformity with minimum requirements

Navigational radar installations shall be tested according to the requirements of the European Standard EN 303 676 : 2021.

[1] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC Text with EEA relevance (OJ L 153, 22.5.2014).

Appendix

Figure 1: Inland ECDIS equipment, standalone equipment connected to the navigational radar installation (system configuration 2)

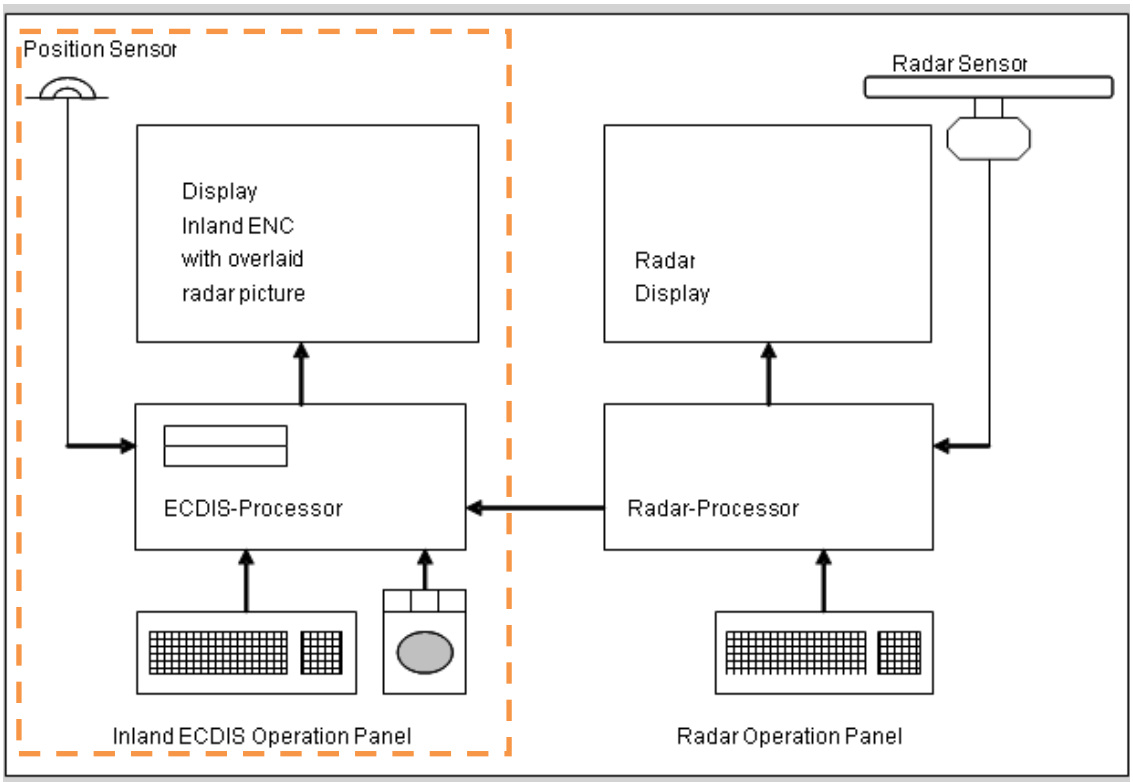
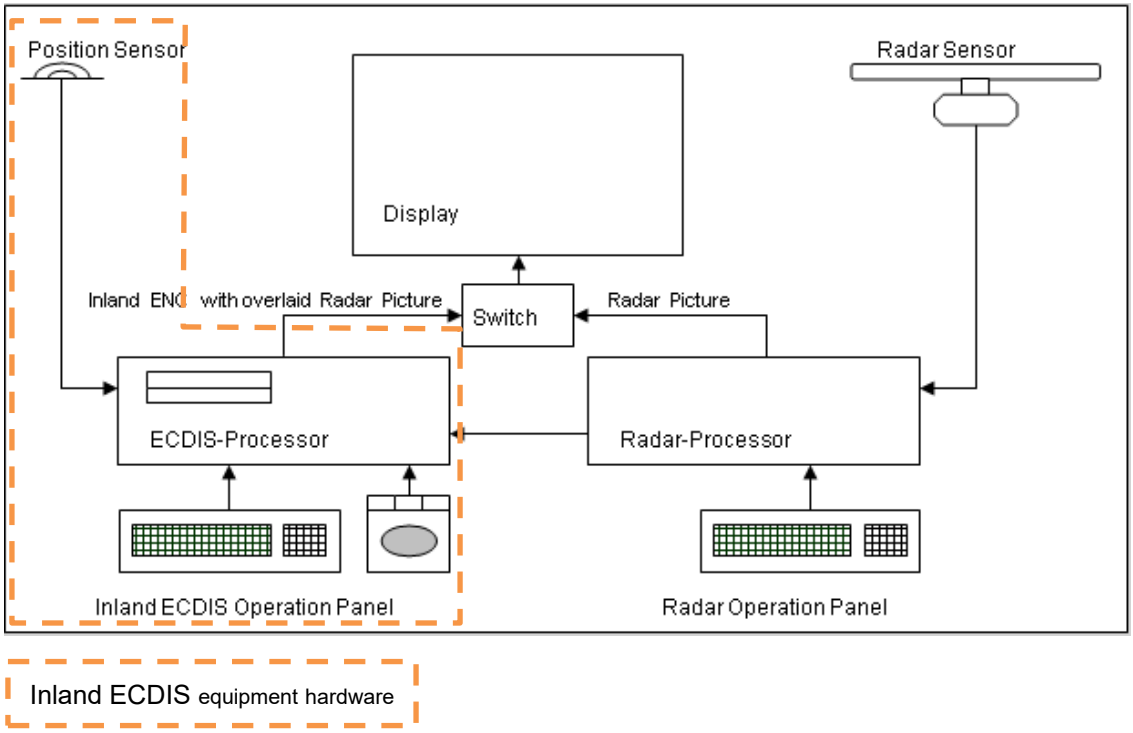


Figure 2: Inland ECDIS equipment, standalone equipment connected to the navigational radar installation and shared monitor (system configuration 3)



Chapter 2
Installation and performance tests

Article 2.01
General

1. Installation and performance tests of navigational radar installations shall take place according to the following provisions.

2. Only navigational radar installations with a type-approval according to Section II, Chapter 1, shall be authorised for installation.

3. If an Inland AIS equipment is connected to a navigational radar installation not fitted with an inland electronic navigation chart for displaying AIS symbols, an approved compass according to Section II, Article 2.06 must also be connected in order to comply with the requirement in Section II, Article 0.01.

Article 2.02
Installation of the radar antenna

1. The radar antenna shall be installed as close as possible to the fore-and-aft-line of the vessel. There shall be no obstruction in the immediate vicinity of the antenna causing false echoes or unwanted shadows; if necessary, the antenna shall be mounted on the fore-section. The mounting and attachment of the radar antenna in its operational position shall be sufficiently stable to enable the navigational radar installation to perform within the required accuracy limits.

2. After the angular error that occurred during the mounting has been corrected, the difference between lubber line and fore-and-aft-line shall not be greater than 1° once the radar picture has been adjusted.

Article 2.03
Installation of the display unit and the control unit

1. The display unit and control unit shall be installed in the wheelhouse in such a way that the evaluation of the radar picture and the operation of the navigational radar installation present no difficulty. The azimuthal orientation of the radar picture shall be in accordance with the normal situation of the surroundings. Holders and adjustable consoles shall be constructed in a way that they can be fixed in each position free of vibration.

2. During radar navigation, artificial lighting shall not be reflected in the direction of the radar operator.

3. When the control unit is not part of the display unit, it shall be located in a housing within 1 m range to the display unit. Wireless remote controls shall not be permitted.

4. If slave indicators are installed, they shall satisfy the requirements which apply to navigational radar installations.

Article 2.04
Installation of the position sensor

For Inland ECDIS equipment which is operated in navigation mode, the position sensor (e.g. DGNSS antenna) must be installed in such a way as to ensure that it operates with the greatest possible degree of accuracy and is not adversely affected by superstructures and transmitting equipment on board of the vessel.

Article 2.05
Power supply

The navigational radar installation shall be connected directly to a power supply system in accordance with Article 10.02. The navigational radar installation shall feature a power circuit with its own circuit-breaker having regard to Article 10.12(2)(a) and be capable of being supplied with power at all times.

Article 2.06
External sensors for geo-spatial positioning or determining the heading

If data from external sensors for geo-spatial positioning or determining the heading are used by a navigational radar installation, these sensors must be type-approved in accordance with the following maritime Standards:

Sensor	Minimum requirements in accordance with	
	Standard (IMO)	ISO/IEC Standard
GPS	MSC.112(73)[1]	IEC 61108-1 : 2003
DGPS/DGLONASS	MSC.114(73)[2]	IEC 61108-4 : 2004
Galileo	MSC.233(82)[3]	IEC 61108-3 : 2010
Heading/GPS Compass	MSC.116(73)[4]	ISO 22090-3 : 2014 Part 3: GNSS principles

1 MSC.112(73) adopted on 1 December 2000- Revised Performance Standards for Shipborne Global Positioning System (GPS) Receiver Equipment.

2 MSC.114(73) adopted on 1 December 2000 - Revised Performance Standards for Shipborne DGPS and DGLONASS Maritime Radio Beacon Receiver Equipment.

3 MSC.233(82) adopted on 5 December 2006 - Performance Standards for Shipborne Galileo Receiver Equipment.

4 MSC.116(73) adopted on 1 December 2000 - Performance Standards for marine transmitting heading devices (THDs).

Article 2.07
Other conditions

The following conditions are to be complied with when installing navigational radar installations:

a) the operating voltage shall be within the tolerance;

b) the cabling and its installation shall satisfy the provisions of this Standard and, if applicable the Regulations annexed to the ADN;

c) the rate of antenna revolutions shall reach at least 24 rpm;

d) there shall be no obstruction in the immediate vicinity of the antenna which impairs navigation, causes false echoes or causes unwanted shadows;

e) the safety switch of the antenna, if provided, shall be in proper working order;

f) the arrangement of display units and control units shall be ergonomic and user-friendly;

g) the lubber line of the navigational radar installation shall not deviate from the vessel’s fore-and-aft-line by more than 1 ;

h) the accuracy of the range and azimuthal displays shall satisfy the requirements (measurements using known targets);

i) linearity in short ranges shall be correct;

j) the displayed minimum range shall be 15 m or less;

k) the centre of the picture shall be visible and its diameter shall not exceed 1 mm;

l) sea-clutter and rain-clutter suppressors (STC and FTC preset) and the associated controls shall be in proper working order;

m) the gain adjustment shall be in proper working order;

n) focus and picture definition shall be correct;

o) the navigational radar installation shall not be sensitive to transmissions by the vessel's radio equipment and to interference from other on-board sources;

p) the navigational radar installation shall not interfere with other on-board equipment.

Furthermore, in the case of inland ECDIS equipment in navigation mode:

q) the static positional error affecting the chart shall not exceed 2 m;

r) the static phase angle error affecting the chart shall not exceed 1°.

Section III
Rate-of-turn indicators

Article 0.01
Purpose of the rate-of-turn indicator

The rate-of-turn indicator is intended to facilitate radar navigation, and to measure and indicate the rate of turn of the vessel to port or starboard.

Chapter 1
Minimum requirements and conditions for testing conformity with these minimum requirements

Article 1.01
Construction, design

1. Rate-of-turn indicators shall be suitable for operation on board inland navigation vessels.

2. The construction and design of the equipment shall be in accordance with current good engineering practice, both mechanically and electrically.

3. In the absence of any specific provision in this Standard, the requirements and test methods contained in European Standard EN 60945 : 2002 shall apply to power supply, safety, mutual interference of ship borne equipment, compass safe distance, resistance to climatic influences, mechanical strength, environmental influences, audible noise emission and equipment markings.

   The equipment shall satisfy all requirements of this Chapter at ambient temperatures between 0 °C and 40 °C.

Article 1.02
Spurious emissions and electromagnetic compatibility

1. Rate-of-turn indicators shall meet the requirements of Directive 2014/30/EU[1].

2. In the frequency ranges of 156-165 MHz, 450-470 MHz and 1,53-1,544 GHz, the field strength shall not exceed a value of 15 µV/m. These field strengths shall apply at a test distance of 3 m from the equipment under test.

3. The rate-of-turn indicator shall be insensitive to magnetic fields which typically occur on board the vessel.

[1] Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (OJ L 96, 29.3.2014).

Article 1.03
Operation

1. The equipment shall not have more controls than are necessary for its correct operation.

   The design, markings and manipulation of the controls shall be such as to permit their simple, unambiguous and fast operation.

   Their arrangement shall be such as to prevent operational mistakes as far as possible.

   Controls that are not necessary for normal operation shall not be immediately accessible.

2. All controls and indicators shall be provided with symbols and/or markings in English. Symbols shall meet the requirements of International Standard IEC 60417 : 2025 DB (graphical symbols for use on equipment).

   All numerals and letters shall be at least 4 mm high. If it can be demonstrated that, for technical reasons, numerals and letters 4 mm high are not possible and if for the purposes of operation smaller numerals and letters are acceptable, a reduction to 3 mm shall be allowed.

3. The equipment shall be designed in such a way that operating mistakes cannot cause its failure.

4. Any functions over and above the minimum requirements, such as facilities for connection to other equipment, shall be provided in such a way that the equipment meets the minimum requirements under all conditions.

5. All controls shall be so arranged that during their operation no corresponding information is concealed from view and radar navigation remains unimpaired.

6. All controls and indicators shall be provided with a dazzle-free source of lighting appropriate for all ambient lighting conditions and adjustable down to zero by means of an independent control.

7. Adjustment of controls shall be such that movements to the right or upwards have a positive effect on the variable and movements to the left or downwards a negative effect.

8. If push-buttons are used, it shall be possible to locate and operate them by touch. They shall also have clearly perceptible contact release. If push-buttons have multiple functions, it must be apparent which hierarchical level is active.

Article 1.04
Installation of the sensor

The installation direction of the rate-of-turn indicator's sensor unit relative to the keel line shall be indicated on the sensor unit. Installation instructions shall be provided to ensure maximum insensitivity to other normal movements of the vessel.

Article 1.05

Operational readiness of the rate-of-turn indicator

1. From a cold start, the rate-of-turn indicator shall be fully operational within 4 minutes and shall operate to within the required accuracy limits.

2. An optical signal shall indicate that the indicator is switched on. It shall be possible to observe and operate the rate-of-turn indicator simultaneously.

Article 1.06

Indication of the rate of turn

1. The rate of turn shall be indicated on a linear graduated scale having the zero point situated in the middle. The rate of turn shall be readable with the required accuracy in terms of direction and magnitude. Indicators other than needle indicators and bar-graphs shall not be permitted.

2. The indicator scale shall be at least 20 cm long and may be circular or rectilinear.

   Rectilinear scales shall be arranged horizontally only.

3. Digital-only indicators shall not be accepted.

Article 1.07

Measuring ranges

Rate-of-turn indicators may be provided with one or more measuring ranges. The following measuring ranges are recommended:

30°/min
60°/min
90°/min
180°/min
300°/min.

Article 1.08

Accuracy of the indicated rate of turn

The indicated rate of turn shall not differ by more than 2 % from the measurable maximum value or by more than 10 % from the actual value; whichever is the greater (see Appendix).

Article 1.09
Sensitivity

The operating threshold shall be less than or equal to a change in rate of turn equivalent to 1 % of the indicated value.

Article 1.10
Monitoring of operation

1. If the rate-of-turn indicator does not operate within the required accuracy limits, this shall be indicated.

2. If a gyroscope is used, any critical fall in the rate of rotation of the gyroscope shall be signalled by an indicator. A critical fall in the rate of rotation of the gyroscope is one which lowers accuracy by 10 %.

Article 1.11
Insensitivity to normal movements of the vessel

1. Rolling of the vessel of up to 10° at a rate of turn of up to 4°/s shall not give rise to measurement errors in excess of the stipulated tolerances.

2. Impacts such as those that may occur during berthing shall not give rise to permanent measurement errors in excess of the stipulated tolerances.

Article 1.12
Damping devices

1. The sensor system shall be damped for critical values. The damping constant (63 % of the limit value) shall not exceed 0,4 seconds.

2. The indicator shall be damped for critical values.

   Control units for increasing damping shall be permitted.

   Under no circumstances shall the damping constant exceed 5 seconds.

Article 1.13

Connection of additional equipment

1. Slave indicators shall comply with all requirements which apply to rate-of-turn indicators.

2. If the rate-of-turn indicator can be connected to slave indicators or similar equipment, the indication of the rate-of-turn shall remain usable as an analogue or digital electric signal. Digital interfaces must be constructed in accordance with (3).

   The analogue rate-of-turn signal shall be galvanically isolated from earth and continue to be indicated for the equivalent to an analogue voltage of 20 mV/°/min ±5 % and a maximum internal resistance of 100 Ω.

   Polarity shall be positive when the vessel is turning to starboard and negative when it is turning to port.

   The operating threshold shall not exceed 0,3°/min.

   Zero error shall not exceed 1°/min at temperatures from 0 °C to 40 °C.

   With the indicator switched on and the sensor not exposed to the effects of movement, the spurious voltage at the output signal measured with a 10 Hz pass-band low-pass filter shall not exceed 10 mV.

   The rate-of-turn signal shall be received without additional damping beyond the limits referred to in Article 1.12(1).

3. A digital interface shall be designed pursuant to European Standards EN 61162-1 : 2024, EN 61162-2 : 2024 and EN 61162-3 : 2008.

4. An external alarm switch shall be provided. The switch shall be installed as a galvanic insulation break-switch for the rate-of-turn indicator.

   The external alarm shall be triggered by contact closure:

   a) if the rate-of-turn indicator is disconnected; or

   b) if the rate-of-turn indicator is not in working order; or

   c) if the operating control has reacted following an excessive error (Article 1.10).

Article 1.14

Conditions for testing conformity with minimum requirements

1. Rate-of-turn indicators shall be tested under nominal and boundary conditions. In this regard, the influence of the operating voltage and of the ambient temperature shall be tested as far as the prescribed limit values.

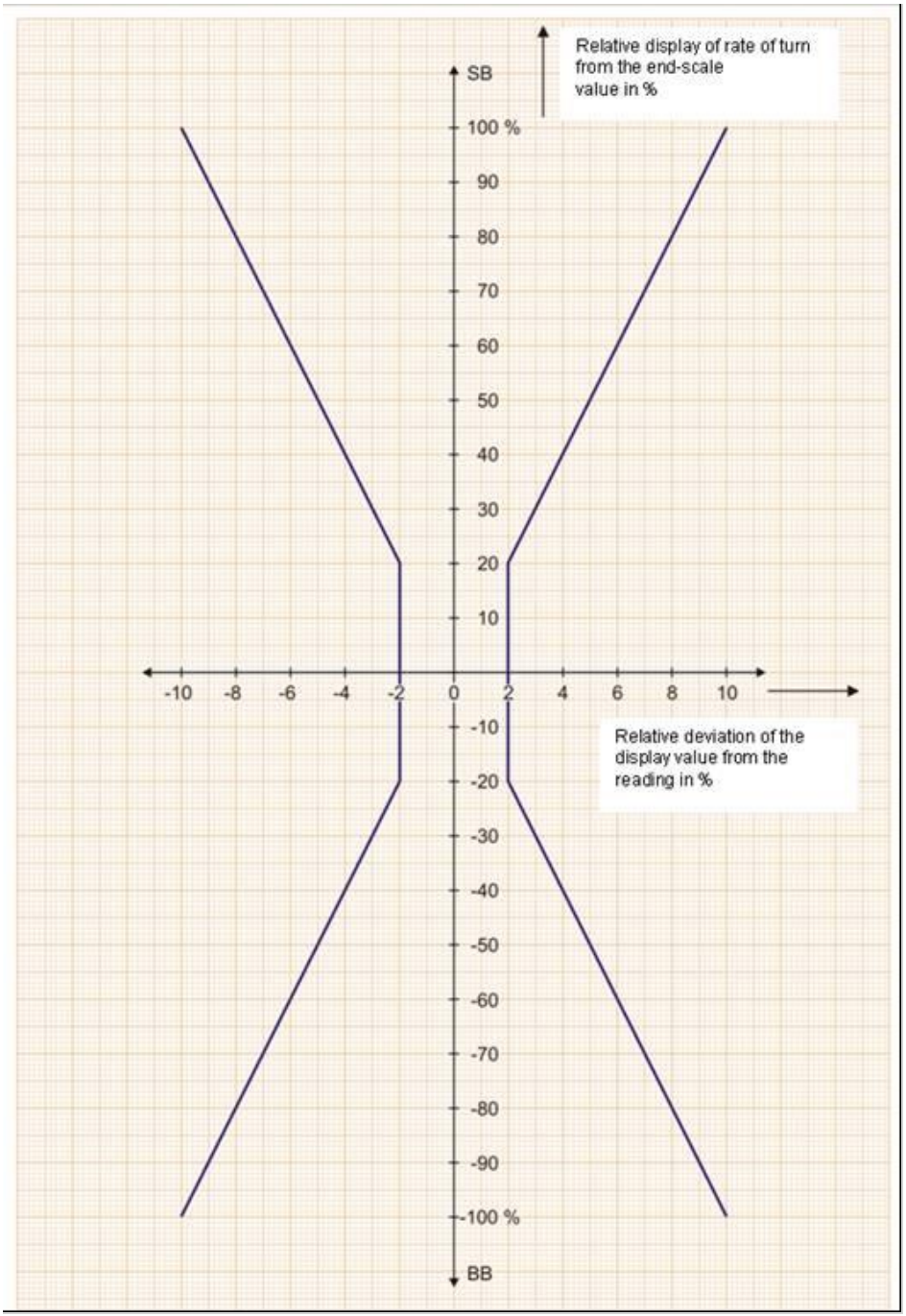
   In addition, radio transmitters shall be used to set up the maximum magnetic fields in the vicinity of the indicators.

2. Power supply, safety, mutual interference of ship borne equipment, compass safe distance, resistance to climatic influences, mechanical strength, environmental impact, audible noise emission and electromagnetic compatibility shall be tested in accordance with European Standard EN 60945 : 2002.

3. Spurious emissions shall be measured in accordance with European Standard EN 60945 : 2002 in the frequency range of 30 MHz to 2000 MHz. The requirements of Article 1.02(2) shall be met.

4. Under the conditions described in (1), indication errors shall remain within the tolerances indicated in the Appendix.

Appendix
Figure 1: Maximum tolerances for indication errors of rate-of-turn indicators



Chapter 2
Installation and performance tests

Article 2.01
General

1. Installation and performance tests of rate-of-turn indicators must take place according to the following provisions.

2. Only rate-of-turn indicators with a type-approval according to Section III, Chapter 1, shall be authorised for installation.

Article 2.02
Installation of the rate-of-turn indicator

1. The rate-of-turn indicator shall be located ahead of the person at helm and within their field of view.

2. The sensor system shall be installed as far as possible amidships, horizontal and aligned with the ship's fore-and aft-line. The installation site shall as far as possible be free of vibration and be liable only to modest temperature variations. The indicator unit shall if possible be installed directly above the radar display.

3. If slave indicators are installed, they shall satisfy the requirements which apply to rate-of-turn indicators.

4. Wireless remote controls shall not be permitted.

Article 2.03
Power supply

The rate-of-turn indicator shall be connected directly to a power supply system in accordance with Article 10.02. The rate-of-turn indicator shall feature a power circuit with its own circuit-breaker having regard to Article 10.12(2)(a) and be capable of being supplied with power at all times.

Article 2.04
Other conditions

The following conditions are to be complied with when installing rate-of-turn indicators:

a) the operating voltage shall be within the tolerance;

b) the cabling and its installation shall satisfy the provisions of this Standard and, if applicable the Regulations annexed to the ADN;

c) the arrangement of rate-of-turn indicators shall be ergonomic and user-friendly;

d) the vessel's turning direction shall be as indicated on the rate-of-turn indicator and the zero position at dead ahead shall be correct;

e) the rate-of-turn indicator shall not interfere with other on-board equipment.

Section IV
Inland AIS equipment

Article 0.01
Purpose of the Inland AIS equipment

The Inland AIS equipment is intended to improve the safety of navigation by assisting in the efficient operation of vessel traffic services, ship reporting, and in efficient ship-to-ship and ship-to-shore operations.

Chapter 1
Minimum requirements and conditions for testing conformity with these minimum requirements

Article 1.01
Minimum requirements

Inland AIS equipment shall comply with the requirements of ES-RIS, part II.

Article 1.02
Conditions for testing conformity with minimum requirements

Inland AIS equipment shall be tested according to the requirements of ES-RIS, part VI.

Chapter 2
Installation and performance tests

Article 2.01
General

1. Installation and performance tests of Inland AIS equipment must take place according to the following provisions.

2. Only Inland AIS equipment with a type-approval according to Section IV, Chapter 1, shall be authorised for installation.

Article 2.02
Installation of Inland AIS equipment

1. The Inland AIS equipment shall be installed at an appropriate location in such way that
   a) it does not disturb the operation of other navigation equipment such as navigational radar installations or radiotelephone installations and
   b) conversely other navigation equipment does not disturb the correct operation of the Inland AIS equipment.

2. The MKD (Minimum Keyboard and Display) shall be accessible to the person at helm. The MKD Information shall be located within the person at helm's direct field of view. Other devices used for navigation purposes may however take priority as regards their direct visibility. It shall be possible to establish visually whether the equipment is operating. All warning indicator lights shall remain visible after installation.

Article 2.03
Power supply

The Inland AIS equipment shall be connected directly to a power supply system in accordance with Article 10.02. The Inland AIS equipment shall feature a power circuit with its own circuit-breaker having regard to Article 10.12(2)(a) and be capable of being supplied with power at all times.

Article 2.04
Antennas

1. Inland AIS equipment antennas shall be installed and properly connected to the equipment, following the manufacturer's instructions, so as to ensure that this equipment operates reliably under all normal conditions of use. Appropriate cable types shall be used to connect the antennas, taking into account the environmental conditions.

2. The VHF antenna of the Inland AIS equipment shall:
   a) be omni-directional with a vertical polarisation;
   b) be installed in such a way that the potential electromagnetic interference with other high-power energy sources, such as navigational radar installations and other VHF antennas, is as low as technically and physically possible.

3. Every Inland AIS equipment shall be connected to its own VHF antenna. Sharing the cables of VHF antennas for radiotelephone installations and Inland AIS equipment is not allowed.

4. The internal GNSS sensor of the Inland AIS equipment shall be connected to a suitable GNSS antenna, even if the Inland AIS equipment is connected to an external GNSS position sensor.

Article 2.05
External sensors for geo-spatial positioning or determining the heading

If data from external sensors for geo-spatial positioning or determining the heading are used by an Inland AIS equipment, these sensors must be type-approved in accordance with the following maritime Standards:

Sensor	**Minimum requirements in accordance with**	
	Standard (IMO)	**ISO/IEC Standard**
GPS	MSC.112(73)[1]	IEC 61108-1 : 2003
DGPS/DGLONASS	MSC.114(73)[2]	IEC 61108-4 : 2004
Galileo	MSC.233(82)[3]	IEC 61108-3 : 2010
Heading/GPS Compass	MSC.116(73)[4]	ISO 22090-3 : 2014 Part 3: GNSS principles

1 MSC.112(73) adopted on 1 December 2000- Revised Performance Standards for Shipborne Global Positioning System (GPS) Receiver Equipment.

2 MSC.114(73) adopted on 1 December 2000 - Revised Performance Standards for Shipborne DGPS and DGLONASS Maritime Radio Beacon Receiver Equipment.

3 MSC.233(82) adopted on 5 December 2006 - Performance Standards for Shipborne Galileo Receiver Equipment.

4 MSC.116(73) adopted on 1 December 2000 - Performance Standards for marine transmitting heading devices (THDs).

Article 2.06
Blue board

1. If the Inland AIS equipment is connected to the blue board prescribed by the applicable navigational authority regulations of the Member States, the real state of the blue board shall be determined and displayed under all normal conditions of use.

2. The status “not available” shall be used if the blue board is not connected to the Inland AIS equipment.

Article 2.07
Other conditions

1. When two Inland AIS equipment are installed on the same vessel, then they shall have corresponding configurations.

2. The requirements laid down in 2.02(1), 2.04, 2.06 and 2.07(1) shall apply only to Inland AIS equipment installed after 1 January 2026, unless the inspection body detects malfunctions in equipment already installed before that date.

Section V
Tachographs

Article 0.01
Purpose of the tachograph

The tachograph shall record sailing time of a vessel.

Chapter 1
Minimum requirements and conditions for testing conformity with these minimum requirements

Article 1.01
Ascertaining the vessel's sailing time

To determine navigation according to the criterion yes/no, the rotation of the propeller must be measured at an appropriate place. Where propulsion is other than by propeller, the vessel's movement must be ascertained in an equivalent manner at appropriate place. Where there are two or more propeller shafts, it must be ensured that recording will operate even if only one of the shafts is turning.

Article 1.02
Vessel identification

The unique European vessel identification number or official vessel number must be indelibly recorded on the data medium and be readable from it.

Article 1.03
Recording on the data medium

The following items of information must be recorded on the data medium such as to be tamper-proof and readable from it: the vessel's operating mode, the date and time at which the tachograph was operating and ceased operating, the insertion and removal of the data medium and other actions performed on the device. The tachograph must automatically record the time, insertion and removal of the data medium, the opening and closure of the device as well as any interruption to its power supply.

Article 1.04
Recording time per day

The date and time at which the shaft starts and stops rotating must be continuously recorded daily between 00.00 and 24.00.

Article 1.05
Reading the recording

The recording must be unequivocal, easy to read and clearly comprehensible. It must be possible to read the recording at any moment without any special auxiliary devices.

Article 1.06
Printing the recording

It must be possible for the recordings to be provided at any time as a readily transparent printout.

Article 1.07
Security of the recording

The rotation of the propeller must be recorded in a way that cannot be tampered with.

Article 1.08
Accuracy of the recording

The rotation of the propeller must be recorded in a way that is accurate in time. The recording must be readable with an accuracy of 5 minutes.

Article 1.09
Operating voltages

Voltage fluctuations of up to ±10 % of the nominal value must not hinder the proper functioning of the device. Moreover, the installation must be capable of withstanding a 25 % increase in the supply voltage relative to the nominal voltage for at least 5 minutes without its serviceability being impaired in any way.

Article 1.10
Operating conditions

The devices or device components must operate faultlessly under the following conditions:

-	ambient temperature:	0 °C to 40 °C
-	humidity:	up to 85 % relative air humidity
-	type of electrical protection:	IP 54 in accordance with the European Standard EN 60529 : 2014
-	oil resistance:	if intended to be installed in the engine room, the devices or device components must be oil resistant
-	permissible time recording tolerances:	± 2 minutes per 24 hours.

Article 1.11
Conditions for testing conformity with minimum requirements

(left void)

Chapter 2
Installation and performance tests

Article 2.01
General

1. Installation and performance tests of tachographs must take place according to the following provisions.

2. Only tachographs with a type-approval according to Section V, Chapter 1, shall be authorised for installation

Article 2.02
Installation of the tachograph

1. The tachograph shall be installed in the wheelhouse or other readily accessible location.

2. It shall be possible to establish visually whether the equipment is operating.

Article 2.03
Power supply

The tachograph shall be connected directly to a power supply system in accordance with Article 10.02. The tachograph shall feature a power circuit with its own circuit-breaker having regard to Article 10.12(2)(a) and capable of being supplied with power at all times.

Article 2.04
Capturing the movement of the vessel

1. Information concerning the vessel's movement, namely whether the vessel is “underway” or “not underway” is derived from the movement of the propulsion system. The corresponding signal must originate from the rotation of the propeller, from the propeller shaft or from the operation of the propulsion machinery. In the case of different propulsion systems, an equivalent solution must be achieved.

2. The technical equipment for capturing the movement of the vessel must be installed so as to be as operationally reliable as possible and immune from unauthorised interventions. To this end, the signal transmission circuit (including the signal generator and device inlet terminal), from the propulsion system to the device must be protected by appropriate means with monitoring to detect any interruption of the circuit. Appropriate for this purpose are for example seals bearing identification markings and visible cable runs or monitoring circuits.

Article 2.05
Other conditions

The vessel's command must be trained in the use of the tachograph by the approved specialist firm.

Section VI
Track Guidance Assistants for Inland Navigation (TGAIN)

Article 0.01
Purpose of the TGAIN

The Track Guidance Assistants for Inland Navigation (TGAIN) are intended to steer the vessel automatically along a track to follow. This equipment indirectly commands the steering apparatus to change the rudder angle (vessel's heading) and possibly the propulsion system (vessel's speed).

Chapter 1
Minimum requirements and conditions for testing conformity with these minimum requirements

Article 1.01
Construction, design

1. TGAIN shall be suitable for operation on board inland navigation vessels.

2. The construction and design of the equipment shall be in accordance with current good engineering practice, both mechanically and electrically.

3. The TGAIN's main control unit and its interface to the steering system shall comply with the requirements set out in Article 12.06, with the exception of the temperature range, which may be reduced to a range of 0 °C to 40 °C if the TGAIN is installed in the wheelhouse.

4. TGAIN shall be designed to ensure a minimum durability period before predictable failures of critical components occur.

Article 1.02
Operation

1. The design, markings and manipulation of the control units shall be such as to permit their simple, unambiguous and fast operation.

   Their arrangement shall be such as to prevent operational mistakes as far as possible.

   Control units that are not necessary for normal operation shall not be immediately accessible.

2. All controls and indicators shall be provided with symbols and/or markings in English. Symbols shall meet the requirements of International Standard IEC 60417 : 2025 DB (graphical symbols for use on electrical equipment). If a symbol and/or marking for a control or indicator is not included in International Standard IEC 60417 : 2025, an appropriate own symbol shall be used.

3. The equipment shall be designed in such a way that operating mistakes cannot cause its failure.

4. Any functions over and above the minimum requirements, such as facilities for connection to other equipment, shall be provided in such a way that the equipment meets the minimum requirements under all conditions.

5. All controls shall be so arranged that during their operation no corresponding information is concealed from view and radar navigation remains unimpaired.

6. If push-buttons are used, it shall be possible to locate and operate them by touch. If push-buttons have multiple functions, it must be apparent which hierarchical level is active.

7. Touchscreens are permitted. To prevent unintentional use and in accordance with Section VI, article 1.09, the touchscreens are not permitted to deactivate the TGAIN.

Article 1.03
Operational readiness of the TGAIN

A signal shall indicate the operational readiness of the TGAIN.

Article 1.04
Monitoring of operation

If the TGAIN does not operate within the required accuracy limits, this shall be indicated.

Article 1.05
Electromagnetic compatibility

The TGAIN shall be insensitive to magnetic fields which typically occur on board the vessel and comply with the requirements set out in Article 12.07(4) and (5).

Article 1.06
Control of the propulsion system

(Left void)

Article 1.07
Display

The TGAIN shall display at least

a) the information related to tracks and operational status mentioned in ES-RIS Part I Article 2.03(17), and

b) the generic warnings and alarms mentioned in ES-RIS Part I Article 2.08

on an Inland ECDIS equipment in accordance with ES-RIS, Part I.

Other information, warnings and alarms can be displayed on the control unit.

Article 1.08

Configuration and track control

1. The TGAIN shall guide the vessel with minimal course deviation along a track to follow.

2. The TGAIN shall respond safely to influences such as
   a) wind, wake, current, changing water level conditions;
   b) normal yaw, pitch and roll movements;
   c) loading conditions;
   d) vessel or convoy type.

3. The TGAIN shall process error messages from connected safety-related sensors.

4. The TGAIN shall be able to compensate for inadequacies in the information provided by the connected sensors.

5. The TGAIN shall enable the person at helm, when the TGAIN is activated, to adapt the track to follow and then guide the vessel safely to the alternative track.

Article 1.09

TGAIN activation and deactivation

1. It shall be possible at all times to deactivate the TGAIN, regardless of rudder position, and even when the TGAIN is malfunctioning, by operating the steering lever, and optionally
   a) pushing a physical button,
   b) using an actuator on the TGAIN, or
   c) using an actuator on the rate-of-turn regulator.

2. Deactivation of the TGAIN by operating the steering lever shall automatically trigger an acoustic warning signal.

Article 1.10

Warnings and alarms

1. The TGAIN shall trigger
   a) a warning signal in the event of malfunction, or if specific operating parameters are out of limits.
   b) an alarm signal in the event of critical malfunctions.

2. An optical warning signal shall be triggered at least for the following:
   a) in the event of an excessively uncertain position,
   b) in the event of an excessively uncertain heading,
   c) in the event of a sensor failure or inconsistent status information owing to contradictory sensor and system information,
   d) before the end of a planned track,
   e) in the event of excessive changes in the monitored rate-of-turn.

3. An optical and acoustic alarm signal shall be triggered at least for the following:

a) in the event of a detectable TGAIN failure,

b) in the event of a detectable malfunction or deactivation of the Inland ECDIS equipment referred to in Section VI, Article 1.07,

c) in the event of an excessive deviation from the track to follow,

d) in the event of the setpoints (speed, angle, rate of turn) cannot be reached in the required time,

e) in the event of detectable malfunctions affecting the steering apparatus drive unit,

f) (left void)

g) shortly before the end of a planned track,

h) in the event of dead reckoning exceeding a specific duration,

i) in the event of an excessive discrepancy from the targeted position, as a result of which the targeted position can no longer be reached,

j) in the event of an excessive discrepancy between the planned and actual track, as a result of which the planned track can no longer be reached,

k) in the event of an excessive discrepancy between the actual track and the heading, as a result of which the planned track can no longer be reached,

l) in the event of a detectable malfunction or deactivation of the recording referred to in Section VI, Article 1.14.

Article 1.11

Alarms before a foreseeable lock passage

1. To enable the person at helm to deactivate the TGAIN in a timely manner:

a) an optical alarm signal shall be triggered in the wheelhouse 7 minutes before a foreseeable lock passage;

b) if the TGAIN is not deactivated, an acoustic alarm signal shall also be triggered in the wheelhouse 6 minutes before a foreseeable lock passage;

c) if the TGAIN is not deactivated, the alarm signal in accordance with Article 7.09 shall also be triggered 5 minutes before a foreseeable lock passage.

The time of the foreseeable lock passage is determined by the TGAIN, taking into account the current speed of the vessel and the remaining distance to be travelled.

2. It must not be possible to activate the TGAIN less than seven minutes before a foreseeable passage through a lock.

Article 1.12

Awareness monitoring alarms

TGAIN shall be able to be connected to awareness monitoring system or integrate this functionally to trigger the optical, acoustic and general alarms in accordance with Section VI, Article 2.03.

Article 1.13
Sensors

1. Any sensors connected to the TGAIN shall
   a) provide operational status and error information; or
   b) provide the equivalent information by redundancy and ensure that a single failure of one sensor does not affect the proper functioning of the TGAIN.

2. At least one rate-of-turn indicator with a type-approval according to Section III, Chapter 1, shall be connected to the TGAIN. If data from Inland AIS equipment is used, this equipment shall be type-approved in accordance with Section IV, Chapter 1.

3. If data from external sensors for geo-spatial positioning or determining the heading are used by a TGAIN, these sensors shall be type-approved in accordance with the following maritime Standards

Sensor	**Minimum requirements in accordance with**	
	Standard (IMO)	**ISO/IEC Standard**
GPS	MSC.112(73)[1]	IEC 61108-1 : 2003
DGPS/DGLONASS	MSC.114(73)[2]	IEC 61108-4 : 2004
Galileo	MSC.233(82)[3]	IEC 61108-3 : 2010
Heading/GPS Compass	MSC.116(73)[4]	ISO 22090-3 : 2014 Part 3: GNSS principles

1 MSC.112(73) adopted on 1 December 2000- Revised Performance Standards for Shipborne Global Positioning System (GPS) Receiver Equipment.

2 MSC.114(73) adopted on 1 December 2000 - Revised Performance Standards for Shipborne DGPS and DGLONASS Maritime Radio Beacon Receiver Equipment.

3 MSC.233(82) adopted on 5 December 2006 - Performance Standards for Shipborne Galileo Receiver Equipment.

4 MSC.116(73) adopted on 1 December 2000 - Performance Standards for marine transmitting heading devices (THDs).

Article 1.14
Data recording

1. The TGAIN shall enable the most important operating data to be recorded automatically when the TGAIN is activated. This recording shall be made in a non-volatile memory such that the data can be easily retrieved by the competent authorities and analysed in a verifiable manner for at least the last 30 days. The TGAIN shall not allow the data from the last 30 days to be deleted.

2. Access to the internal parameters of the TGAIN shall be protected by a password.

3. The most important operating data shall include at least the following:
   a) the timing of activation / deactivation of TGAIN;
   b) the position, heading, speed and timing (at least every minute) of the vessel equipped with TGAIN;
   c) the actual track of the vessel equipped with TGAIN;
   d) the track to follow (generated by TGAIN) for the vessel equipped with TGAIN;
   e) the timing of the manual change of the track to follow;
   f) the signal output from the TGAIN to the equipment commanding the steering apparatus and possibly the propulsion system.

Article 1.15
Conditions for testing conformity with minimum requirements

TGAIN shall be tested under normal operating conditions.

Chapter 2
Installation and performance tests

Article 2.01
General

1. Installation and performance tests of TGAIN must take place according to the following provisions.

2. Only TGAIN with a type-approval according to Section VI, Chapter 1, shall be authorised for installation.

3. Operation of the TGAIN shall be checked by means of a navigation test.

Article 2.02

Installation of the Inland ECDIS equipment and the control unit

1. The Inland ECDIS equipment referred to in Section VI, Article 1.07, shall be within the person at helm's direct field of view. The control unit shall be accessible to the person at helm.

2. The TGAIN’s operational status as defined in ES-RIS shall be permanently displayed on the Inland ECDIS equipment referred to in Section VI, Article 1.07.

3. The control unit shall ensure at least the following actions:
   a) deactivating and activating the TGAIN;
   b) acknowledgement of warnings and alarms;
      and
   c) shifting the track or switching to a track proposed by TGAIN.

   Alternatively, the control unit of the connected rate-of-turn regulator can ensure these actions.

4. Wireless remote control of the TGAIN on board is not permitted.

Article 2.03

Awareness monitoring

1. Vessels equipped with a TGAIN shall also be equipped with an awareness monitoring system to ensure that the person at helm is present at all times. The awareness monitoring system, whether standalone or integrated into the TGAIN, shall meet the requirements of Section VII.

2. When the TGAIN is activated, the awareness monitoring system shall be activated automatically.

3. The awareness monitoring system shall be configured so that an action of the person at helm is needed to acknowledge his/her presence in the wheelhouse every 3 minutes (dormant period).

   If the presence is not acknowledged within this period of 3 minutes, an optical alarm signal shall be triggered in the wheelhouse.

   If the presence is not acknowledged within one minute of the optical alarm signal, an acoustic alarm signal shall also be triggered in the wheelhouse.

   If the presence is not acknowledged within one minute of the acoustic alarm signal, the alarm signal in accordance with Article 7.09 shall also be triggered to alert the crew.

Article 2.04

Power supply

The TGAIN shall be connected directly to a power supply system in accordance with Article 10.02. The TGAIN shall feature a power circuit with its own circuit-breaker having regard to Article 10.12(2)(a) and be capable of being supplied with power at all times.

Article 2.05

Electromagnetic compatibility

The TGAIN shall be installed at an appropriate location in such way that

a) it does not disturb the operation of other navigation equipment such as navigational radar installations or radiotelephone installations and

b) conversely other navigation equipment does not disturb the correct operation of the TGAIN.

Article 2.06

Warning and alarms

The inspection body may require a functional test of one or more signals referred to in Section VI, Articles 1.10 to 1.12.

Section VII
Awareness monitoring systems

Article 0.01
Purpose of the awareness monitoring system

1. The awareness monitoring system is intended to monitor the activity at the steering position and detect any disability of the person at helm, which could lead to accidents. This purpose is achieved by a series of consecutive alarms which alert the person at helm and then the crew if the person at helm fails to respond in due time.

2. The awareness monitoring system is either a standalone system or a functionality integrated into other systems, such as TGAIN. In this case, the system in which this functionality is integrated shall meet the requirements of this Section.

Chapter 1
Minimum requirements and conditions for testing conformity with these minimum requirements

Article 1.01
Environmental conditions and electromagnetic compatibility

1. The awareness monitoring system shall comply with the requirements set out in Article 12.06.

2. The awareness monitoring system shall be insensitive to magnetic fields which typically occur on board the vessel and comply with the requirements set out in Article 12.07(4) and (5).

Article 1.02
Activation and deactivation

1. The awareness monitoring system shall be able to be activated and deactivated by another system in a tamper-proof way.

2. The manual deactivation of the awareness monitoring system shall only be possible, when it is not demanded by another system (for instance it can be deactivated manually when the TGAIN is deactivated).

3. In accordance with Article 7.03(4), an indicating light on the awareness monitoring system shall indicate that the system is engaged.

Article 1.03
Accuracy

The awareness monitoring system shall be capable of achieving the timings stated in Section VI, Articles 1.11 and 2.03 with an accuracy of 5 seconds under all environmental conditions

Article 1.04
Protected access to the settings for the timings for the dormant period and alarms

The settings for the timings for the dormant period and the alarms stated in Section VI, Articles 1.11 and 2.03, shall be security protected so that only installation firms can access them.

Article 1.05
Malfunction

1. Any malfunction of the awareness monitoring system or failure of its power supply shall be indicated by an optical and acoustic alarm. A separate alarm for power failure is not necessary when the awareness monitoring system is integrated within TGAIN.

2. In case of malfunction of the awareness monitoring system, the system, that demands the awareness monitoring system (such as TGAIN), cannot be activated.

   In case of malfunction of the awareness monitoring system while the system, that demands the awareness monitoring system (such as TGAIN), is active, the optical and acoustic alarm shall enable the person at helm to deactivate this system (such as TGAIN) in a timely manner (but not later than the alarm triggering times stated in Section VI, Article 1.11).

Article 1.06
Interfacing

1. Connecting wheelhouse equipment capable of generating a reset signal, by contacts, equivalent circuits or serial data, to the awareness monitoring system is permitted.

2. Wireless connections are not permitted.

3. Connecting additional optical and acoustic alarms to the awareness monitoring system is permitted.

Article 1.07
Data back up and password

1. The awareness monitoring system shall be capable of recording:
   a) the timing of activation / deactivation of the awareness monitoring system;
   b) the timing and type of the alarms (optical, acoustic or general);
   c) the timing of the alarm due to malfunction or power failure.

   This recording shall be made in a non-volatile memory such that the data can be easily retrieved by the competent authorities and analysed in a verifiable manner for at least the last 30 days.

2. Access to the internal parameters of the awareness monitoring system shall be protected by a password.

Article 1.08
Conditions for testing conformity with minimum requirements

Awareness monitoring system shall be tested under normal operating conditions.

Chapter 2
Installation and performance tests

Article 2.01
General

1. Installation and performance tests of awareness monitoring systems must take place according to the following provisions.

2. Only awareness monitoring systems with a type-approval according to Section VII, Chapter 1, shall be authorised for installation.

3. A Bridge Navigational Watch Alarm System (BNWAS) type-approved in accordance with IMO Resolution MSC.128(75)[1] can be used instead of awareness monitoring systems, subject that the approved specialist firm certifies that the BNWAS meets the requirements of Section VII, Articles 1.02(2), 1.04, 1.05 and 1.07.

Article 2.02
Monitoring equipment

Awareness monitoring systems are deemed as monitoring equipment and shall meet the requirements of Article 7.03. In the case of an awareness monitoring system which is integrated in the TGAIN, the provisions of Article 7.03(8) are not applicable.

Article 2.03
Reset function

1. The reset function shall cancel the optical and acoustic alarms and initiate a further dormant period. If the reset function is activated before the end of the dormant period, the period shall be re-initiated to run for its full duration from the time of the reset.

2. It shall not be possible to initiate the reset function or cancel any acoustic alarm from any device, equipment or system not physically located in the wheelhouse.

3. Means of initiating the reset function shall only be available at the steering position.

4. The following method is required to initiate the reset function:
   a) by a single action of the person at helm from a device forming an integral part of the awareness monitoring system, for example a manually operated button or a touch screen.

   The following methods are accepted in addition:
   b) by external input signals from other equipment capable of registering good lookout; or
   c) by external input signals from other equipment capable of registering the mental alertness of the person at helm.

5. The manual reset button shall be installed at the steering position, adjacent to the person at helm's seat, ensuring that the person at helm remains oriented toward the navigation horizon and relevant displays and maintains unobstructed view.

[1] MSC.128(75) adopted on 20 May 2002 – Performance standards for a bridge navigational watch alarm system (BNWAS)

6. A continuous activation of any reset device of the awareness monitoring system shall not prolong the dormant period or cause a suppression of the sequence of alarms.

Article 2.04
Reset devices

Reset devices according to Section VII, Article 2.03(4)(a) shall be designed and installed at the steering position so as to prevent their operation by anyone other than the person at helm. These reset devices shall be illuminated so that they are clearly visible at night. Other equipment used to initiate the reset function according to Section VII, Article 2.03(4)(b) and (c) shall be installed at the steering position.

Article 2.05
Optical alarm

1. The optical alarm triggered at the end of the dormant period shall take the form of a flashing light.

2. Flashing lights shall be located within the person at helm's direct field of view and be clearly differentiable from other signals onboard.

3. The colour of the flashing lights shall not impair night vision and a dimmer shall be incorporated to reduce brightness without switching them off completely.

4. A visual indication on the awareness monitoring system shall indicate the cause of the optical alarm.

Article 2.06
Acoustic alarm

1. The acoustic alarm triggered at the end of the optical alarm period shall be audible from all locations in the wheelhouse but shall not startle the person at helm.

   This function can be implemented by means of one or more sound devices.

2. A visual indication on the awareness monitoring system shall indicate the cause of the acoustic alarm.

Article 2.07
General alarm

1. The general alarm triggered at the end of the acoustic alarm period shall comply with Article 7.09.

2. A visual indication on the awareness monitoring system shall indicate the cause of the general alarm.

Article 2.08
Physical integrity of the system

All items of equipment forming part of the awareness monitoring system shall be tamper-proof so that no member of the crew may interfere with the system's operation.

Article 2.09
Power supply

1. The awareness monitoring system shall be connected directly to a power supply system in accordance with Article 10.02. The awareness monitoring system shall feature a power circuit with its own circuit-breaker having regard to Article 10.12(2)(a) and be capable of being supplied with power at all times.

2. This provision under (1) does not apply when the awareness monitoring system is integrated in a TGAIN that is subject to Section VI, Article 2.04. If the awareness monitoring system is integrated into the other systems, combined circuit-breaker is acceptable.

Section VIII
Rate-of-turn regulators connected to a TGAIN

Article 0.01
Purpose of the Rate-of-Turn Regulator (RoTR) connected to a TGAIN

The provisions of this Section apply to Rate-of-Turn Regulators (RoTR) that are connected to both a Track Guidance Assistant for Inland Navigation (TGAIN) and the steering system, enabling the TGAIN to control the steering system.

The RoTR is intended to produce and maintain the setpoints given by the TGAIN, in a feedback loop, for either

a) the rate-of-turn of the vessel or

b) the rudder angle of the vessel.

Chapter 1
Minimum requirements and conditions for testing conformity with these minimum requirements

Article 1.01
Construction, design

1. In addition to Article 6.08, the following requirements apply to RoTR connected to a TGAIN.

2. The RoTR comprises a control unit and a steering lever. Both can be combined into one device.

3. The RoTR shall be designed to ensure a minimum durability period before predictable failures of critical components occur.

Article 1.02
Operation

1. In addition to Articles 6.08(2) and 7.04(7), the following requirements apply to RoTR connected to a TGAIN.

2. The design, markings and manipulation of the control units shall be such as to permit their simple, unambiguous and fast operation.

   Their arrangement shall be such as to prevent operational mistakes as far as possible.

   Control units that are not necessary for normal operation shall not be immediately accessible.

3. All controls and indicators shall be provided with symbols and/or markings in English. Symbols shall meet the requirements of International Standard IEC 60417 : 2025 DB (graphical symbols for use on electrical equipment). If a symbol and/or marking for a control or indicator is not included in International Standard IEC 60417 : 2025, an appropriate own symbol shall be used.

4. The equipment shall be designed in such a way that operating mistakes cannot cause its failure.

5. Any functions over and above the minimum requirements, such as facilities for connection to other equipment, shall be provided in such a way that the equipment meets the minimum requirements under all conditions.

Article 1.03
Operational readiness of the RoTR

1. In addition to Article 6.08(2), the following requirements apply to RoTR connected to a TGAIN.

2. The mode of operation shall be displayed by means of an indicating light, a highlighted text or a symbol.

Article 1.04
Monitoring of operation

1. In addition to Article 6.08(2), the following requirements apply to RoTR connected to a TGAIN.

2. If the RoTR does not operate within the required accuracy limits, this shall be indicated.

Article 1.05
Electromagnetic compatibility

The RoTR connected to a TGAIN shall be insensitive to magnetic fields which typically occur on board the vessel and comply with the requirements set out in Article 12.07(4) and (5).

Article 1.06
Control of the propulsion system

(Left void)

Article 1.07
Operation

Article 7.04(7) applies to RoTR connected to a TGAIN.

Article 1.08
Functionalities

The RoTR connected to a TGAIN shall provide the necessary functionalities to reliably adapt to varying navigation conditions, such as compensating for different loading conditions, vessel trim or rudder offset.

Article 1.09
Steering lever

Article 7.04(5) and (7) apply to RoTR connected to a TGAIN.

Article 1.10
TGAIN deactivation

In accordance with Section VI, Article 1.09, when the TGAIN is deactivated:

a) by operating any steering lever, the RoTR shall automatically cease maintaining setpoints and enable the direct control of the steering system by the steering lever;

b) by using an actuator or pushing a physical button on the TGAIN, the RoTR shall automatically cease maintaining setpoints and enable the direct control of the steering system by the steering lever;

c) by using an actuator on the RoTR, the RoTR shall switch to the selected mode of operation.

Article 1.11
Warnings and alarms

1. In addition to Article 7.04(11)(i), the RoTR connected to a TGAIN shall trigger
   a) a warning signal in the event of malfunction, or if specific operating parameters are out of limits,
   b) an optical and acoustic alarm when the rate-of-turn (°/min) is out of tolerance,
   c) when rudder feedback is provided to the RoTR, an optical and acoustic alarm when the rudder does not move or moves in the wrong direction,
   d) an optical alarm, when the set rate-of-turn (°/min) is not reached within the specified time limits, and
   e) an optical and acoustic alarm in the event of failure of power supply of the rate-of-turn-indicator.

Article 1.12

Connection of additional equipment and sensors

1. Any sensors connected to the RoTR shall provide operational status and error information.

2. At least one rate-of-turn indicator with a type-approval according to Section III, Chapter 1, shall be connected to the RoTR.

3. The RoTR shall provide either an analogue or digital interface to the rate-of-turn indicator in accordance with Section III, Article 1.13(2) and (3).

4. The RoTR shall provide either an analogue or digital interface to the TGAIN. At least the following information shall be exchanged over this interface:

   a) current setpoint from the TGAIN to the RoTR;

   b) readiness handshaking between the TGAIN and the RoTR; and

   c) malfunctions, warnings, errors, from the RoTR to the TGAIN.

5. If data from external sensors for geo-spatial positioning or determining the heading are used by a RoTR, these sensors shall be type-approved in accordance with the following maritime Standards.

Sensor	**Minimum requirements in accordance with**	
	Standard (IMO)	**ISO/IEC Standard**
GPS	MSC.112(73)[1]	IEC 61108-1 : 2003
DGPS/DGLONASS	MSC.114(73)[2]	IEC 61108-4 : 2004
Galileo	MSC.233(82)[3]	IEC 61108-3 : 2010
Heading/GPS Compass	MSC.116(73)[4]	ISO 22090-3 : 2014 Part 3: GNSS principles

Article 1.13

Conditions for testing conformity with minimum requirements

RoTR connected to a TGAIN shall be tested under normal operating conditions.

1 MSC.112(73) adopted on 1 December 2000- Revised Performance Standards for Shipborne Global Positioning System (GPS) Receiver Equipment.

2 MSC.114(73) adopted on 1 December 2000 - Revised Performance Standards for Shipborne DGPS and DGLONASS Maritime Radio Beacon Receiver Equipment.

3 MSC.233(82) adopted on 5 December 2006 - Performance Standards for Shipborne Galileo Receiver Equipment.

4 MSC.116(73) adopted on 1 December 2000 - Performance Standards for marine transmitting heading devices (THDs).

Chapter 2
Installation and performance tests

Article 2.01
General

1. Installation and performance tests of RoTR connected to a TGAIN must take place according to the following provisions.

2. Only RoTR with a type-approval according to Section VIII, Chapter 1, shall be authorised for installation in connection with TGAIN.

3. Operation of the RoTR connected to a TGAIN shall be checked by means of a navigation test.

Article 2.02
Installation of the control unit and the steering lever

1. The control unit and the steering lever shall be within the person at helm's direct field of view. The steering lever shall be accessible to the person at helm.

2. Wireless connection between the RoTR and the TGAIN is not permitted.

3. It shall be checked, both to port and starboard, that when the steering lever is set to its maximum angle position, the rudder stops just before reaching the mechanical limit, if such limit is provided.

Article 2.03
Power supply

Article 6.08(4) applies to RoTR connected to a TGAIN.

Article 2.04
Electromagnetic compatibility

The RoTR shall be installed at an appropriate location in such way that

a) it does not disturb the operation of other navigation equipment such as navigational radar installations or radiotelephone installations and

b) conversely, other navigation equipment does not disturb the correct operation of the RoTR.

Article 2.05
Warning and alarms

The inspection body may require a functional test of one or more signals referred to in Section VIII, Article 1.11.

77. Annex 7, Section IX, Appendix 2, 1st sentence, is worded as follows:

"The International Standards ISO 5815-1 : 2019 and 5815-2 : 2003 stipulate that in order to carry out the analysis to determine biochemical oxygen demand after five days water samples should be stored immediately after sampling and up to the time of analysis in a brim-full, tightly sealed bottle at a temperature of 0–4 °C.".

78. Annex 8 is worded as follows:

"ANNEX 8
SUPPLEMENTARY PROVISIONS APPLICABLE TO CRAFT EQUIPPED WITH PROPULSION OR AUXILIARY SYSTEMS OPERATING ON FUELS WITH A FLASHPOINT EQUAL TO OR LOWER THAN 55 °C

Contents

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- Chapter 5 Other Hydrogen carriers

Section III Energy converters
- Chapter 1 Propulsion and auxiliary systems with fuel cells
- Chapter 2 Propulsion and auxiliary systems with internal combustion engines using LNG as fuel
- Chapter 3 Propulsion and auxiliary systems with internal combustion engines using methanol as fuel
- Chapter 4 Propulsion and auxiliary systems with internal combustion engines using hydrogen as fuel

By extension, the provisions applicable to vessels also apply to floating equipment.

Section I
Definitions

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

1.1 General

1.1.1 ‘enclosed room‘: any room within which, in the absence of forced ventilation, the ventilation will be limited, and any explosive atmosphere will not be dispersed naturally.

1.1.2 ‘semi-enclosed room‘: a room limited by decks or bulkheads in such a manner that the natural conditions of ventilation are notably different from those obtained on open deck.

1.1.3 ‘Pressure Relief Device (PRD)‘: a device designed to protect the tank or piping against unacceptable excess internal pressure, e.g. a Pressure Relief Valve (PRV) or a Temperature Pressure Relief Device (TPRD).

1.1.4 ‘Pressure Relief Valve (PRV)‘: a spring-loaded device which is activated automatically by pressure, the purpose of which is to protect the tank or piping against unacceptable excess internal pressure.

1.1.5 ‘Pressure Vacuum (P/V) valve‘: a valve or set of valves which keeps the tank overpressure or underpressure within tank design limits.

1.1.6 ‘Thermally activated pressure relief device (TPRD)‘: a device which is activated automatically by temperature, the purpose of which is to relieve the tank or piping against being under pressure at unacceptable high temperature.

1.1.7 ‘controlled tank venting system‘: a system fitted with P/V valves to relieve overpressure and underpressure.

1.1.8 ‘ESD‘: emergency shutdown, the immediate stopping of the energy converter and of all its processes as a reaction of the control, monitoring and safety systems to deviations of the process parameters in order to avoid damage to the components and vessel as well as hazards to people.

1.1.9 ‘master fuel valve‘: an automatic shut-off valve in fuel supply lines to engines (respectively fuel cells space).

1.1.10 ‘double block and bleed valve‘: a set of two automated valves in series in a pipe and a third valve enabling the pressure release from the pipe between those two valves. The arrangement may also consist of a two-way valve and a closing valve instead of three separate valves.

1.1.11 ‘air lock‘: a space enclosed by gastight steel bulkheads with two gastight doors, intended to separate a non-hazardous area from a hazardous area.

1.1.12 ‘double wall piping‘: piping with a double wall design for which the space between the walls is pressurised with inert gas and equipped to detect any leakage of one of the two walls.

1.1.13 ‘maximum working pressure‘: the maximum pressure that is acceptable in a fuel tank or piping during operation. This pressure equals the opening pressure of pressure relief devices.

1.1.14 ‘design pressure‘: the pressure on the basis of which the fuel tank or piping has been designed and built.

1.1.15 ‘ventilated ducting‘: a gas pipe installed in a pipe or duct equipped with mechanical exhaust ventilation.

1.1.16 ‘gas warning equipment‘: warning equipment to protect people and property from hazardous gases and gas-air mixtures. It consists of gas detectors to identify gases, a control unit for processing the signals and a display/alarm unit for displaying the status and warning.

1.1.17 ‘secondary barrier‘: the enclosure surrounding of the elements containing fuel (or the fuel cell components), designed to prevent fuel from escaping into the surrounding areas in the case of a leaking component (primary barrier).

1.1.18 ‘lowest possible waterline‘: the waterline corresponding to the displacement of the vessel without ballast and without load.

1.1.19 ‘dual-fuel engine‘: an engine that is designed to simultaneously operate on two fuels, both fuels being metered separately, the consumed amount of one of the fuels relative to the other one being able to vary depending on the operation.

1.1.20 ‘swappable tank‘: a container or rack with one or several tanks, intended for

a) temporary storage of fuel on board, and

b) supplying fuel to the propulsion or auxiliary systems of the vessel.

The container or rack is designed for being moved outboard.

1.1.21 ‘bunkering station‘: the area on board where all equipment used for bunkering is located, such as manifolds, valves, survey instruments, safety equipment, monitoring station, tools, etc.

1.1.22 ‘gas supply system‘: the arrangement, including the gas preparation system, gas supply lines and valves, to supply on board all gas consumer equipment.

1.1.23 ‘dry break-away couplings‘: couplings that provide a safe release and isolation between the receiving vessel and the delivering vessel or facility, to prevent leakage especially in the event of excessive loads.

1.2 Liquefied natural gas (LNG)

1.2.1 ‘Liquefied natural gas (LNG)‘: natural gas (NG) that has been liquefied by cooling it to a temperature of -161 °C.

1.2.2 ‘LNG system‘: all components of the vessel that may contain LNG or NG, such as engines, fuel tanks and bunkering piping.

1.2.3 ‘LNG bunkering system‘: the arrangement for the bunkering of LNG on board (bunkering station and bunkering piping).

1.2.4 ‘LNG containment system‘: the arrangement for the storage of LNG including tank connections.

1.2.5 ‘gas preparation system‘: the unit used to convert LNG into NG, its accessories and its piping.

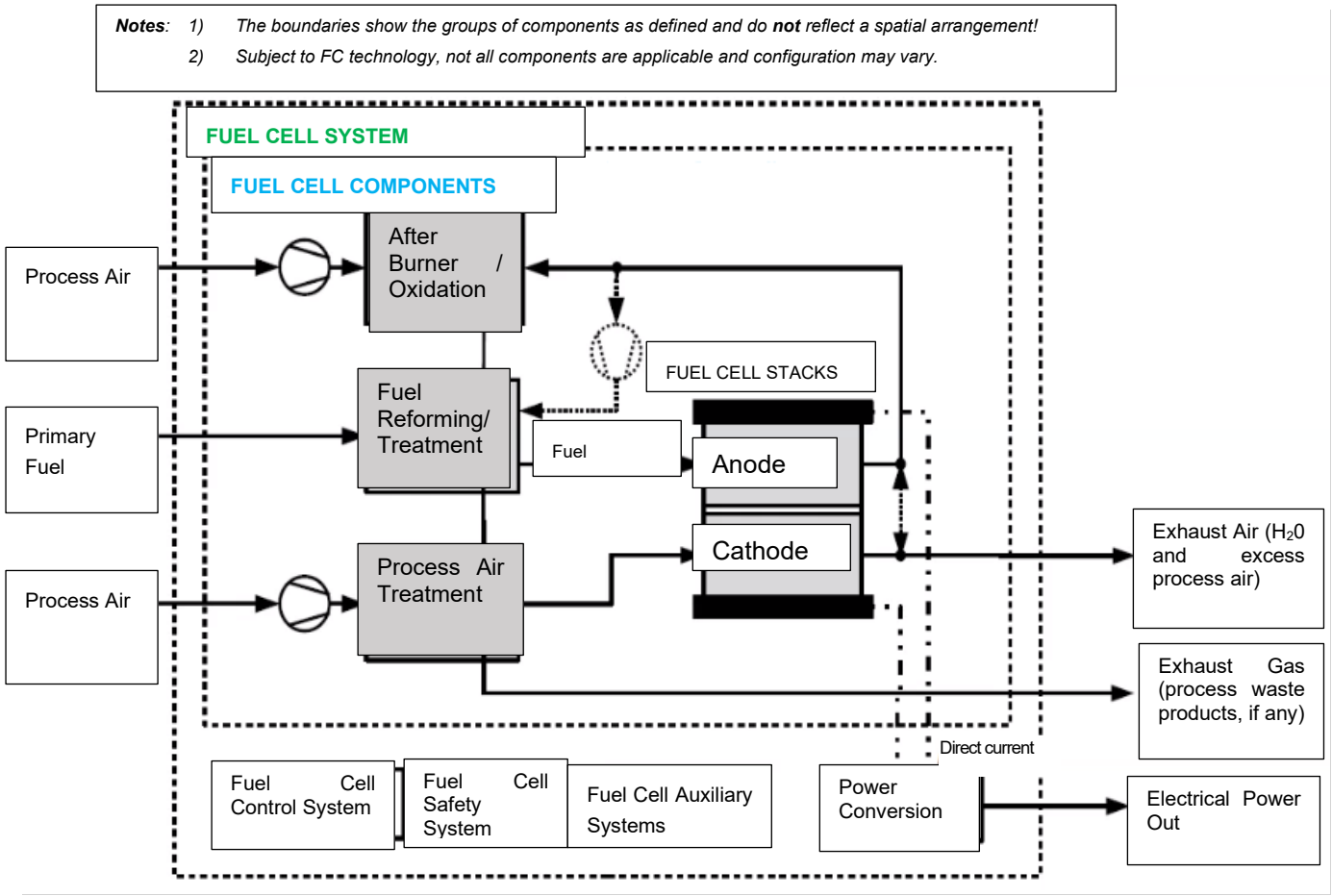
1.2.6 ‘system components‘: all components of the installation that may contain LNG or NG (fuel tanks, pipelines, valves, hoses, pistons, pumps, filters, instrumentation, etc.).

1.3 Fuel cells

1.3.1 'fuel cell system': the system comprising the fuel cell components as well as other components and systems required to operate the fuel cells and to supply electrical power to the vessel. This excludes the bunkering, storage and fuel supply systems.

1.3.2 'fuel cell components': all components of a fuel cell system which may contain fuel or hazardous vapours.

1.3.3 'fuel cell space': any enclosed space or enclosure containing a part or all fuel cell components.



1.3.4 ‘fuel cell‘: an energy converter in which, by oxidation, the chemical energy of the fuel is directly converted to electrical and thermal energy.

1.3.5 ‘reformer‘: a device to convert gaseous or liquid primary fuels to reformate that can be used in fuel cells.

1.3.6 ‘primary fuel‘: fuel supplied to a fuel cell system.

1.3.7 ‘fuel‘: primary fuel or reformate with which the fuel cell is fed to convert energy.

1.3.8 ‘reformate‘: a hydrogen-containing gas generated in the reformer from primary fuel.

1.3.9 ‘buffer vessel‘: a device forming part of the fuel cell system to temporarily hold fuel in order to secure the stable operation of the fuel cell system, in particular to balance the flow of fuel to a fuel cell.

1.4 Hydrogen

1.4.1 ‘hydrogen (H_2)‘: molecule of dihydrogen either gaseous or liquefied.

1.4.2 ‘Gaseous Hydrogen (GH_2)‘: hydrogen in gaseous form, either compressed or not.

1.4.3 ‘Liquefied Hydrogen (LH_2)‘: hydrogen that has been liquefied by cooling.

1.4.4 ‘GH_2 system‘: all components of the vessel that may contain GH_2, such as engines, fuel tanks, bunkering piping and fuel cells.

1.4.5 ‘GH_2 bunkering system‘: the arrangement for the bunkering of GH_2 on board (bunkering station and bunkering piping).

1.4.6 ‘GH_2 containment system‘: the arrangement for the storage of GH_2 including but not limited to tanks, tank connections, possible thermal insulation and pressure relief devices.

1.4.7 ‘GH_2 tank‘: a tank permanently installed in the vessel or a swappable tank.

1.4.8 ‘gas preparation system‘: the arrangement for the preparation of GH_2 for use by GH_2 consumers, including its accessories and its piping.

1.4.9 ‘GH_2 system components‘: all components of the installation that may contain GH_2 (fuel tanks, pipelines, valves, hoses, pistons, pumps, filters, instrumentation, etc.).

Section II
Fuel storage

Chapter 1
LNG

2.1.1 LNG containment system

2.1.1.1 The LNG containment system shall be separated from engine rooms or other high fire risk areas.

2.1.1.2 LNG fuel tanks shall be located as close as possible to the longitudinal centreline of the vessel.

2.1.1.3 The distance between the ship's hull of the vessel and the LNG fuel tank shall not be less than 1,00 m. If LNG fuel tanks are located:

a) below deck, the vessel shall have a double side and a double bottom at the location of the LNG fuel tanks. The width of the double sides and the height of the double bottom shall not be less than 0,60 m.

b) on open deck, the distance shall be at least B/5 from the vertical planes defined by the vessel's sides.

2.1.1.4 The LNG fuel tank shall be an independent tank designed in accordance with the European Standards EN 13530-1 : 2002, EN 13530-2/AC : 2006, ISO 20421-1 : 2019, EN 13458-2 : 2002 in combination with dynamic loads, or the IGC-Code (type C tank). The inspection body can accept other equivalent standards of one of the Member States.

2.1.1.5 Tank connections shall be mounted above the highest liquid level in the tanks. The inspection body can accept connections below the highest liquid level.

2.1.1.6 If tank connections are below the highest liquid level of the LNG fuel tanks, drip trays shall be placed below the tanks that meet the following requirements:

a) the capacity of the drip tray shall be sufficient to contain the volume which could escape in the event of a pipe connection failure;

b) the material of the drip tray shall be suitable stainless steel; and

c) the drip tray shall be sufficiently separated or insulated from the hull or deck structures, so that the hull or deck structures are not exposed to unacceptable cooling in case of leakage of LNG.

2.1.1.7 The LNG containment system shall be provided with a secondary barrier. No secondary barrier is required for the LNG containment systems where the probability for structural failures and leakages through the primary barrier is extremely low and can be neglected.

2.1.1.8 If the secondary barrier of the LNG containment system is part of the hull structure it may be a boundary of the tank room subject to necessary precautions against leakage of cryogenic liquid.

2.1.1.9 The location and construction of the LNG containment system and the other equipment on open deck shall assure sufficient ventilation. Accumulation of escaped NG shall be prevented.

2.1.1.10 If condensation and icing due to cold surfaces of LNG fuel tanks lead to safety or functional problems, appropriate preventive or remedial measures shall be taken.

2.1.1.11 Each LNG fuel tank is to be fitted with at least two pressure relief valves that can prevent an overpressure if one of the valves is closed off due to malfunctioning, leakage or maintenance.

2.1.1.12 If fuel release into the vacuum space of a vacuum insulated LNG fuel tank cannot be excluded, the vacuum space shall be protected by a suitable pressure relief valve. If LNG fuel tanks are located in enclosed or semi enclosed rooms, the pressure relief valve shall be connected to a venting system.

2.1.1.13 The exhaust outlets of the pressure relief valves shall be located not less than 2,00 m above the deck at a distance of not less than 6,00 m from the accommodation, passenger areas and work stations, which are located outside the hold or the cargo area. This height may be reduced when within a radius of 1,00 m round the pressure relief valves outlet there is no equipment, no work is being carried out, signs indicate the area and appropriate measures to protect the deck are being taken.

2.1.1.14 It shall be possible to safely empty the LNG fuel tanks, even if the LNG system is shut down.

2.1.1.15 It shall be possible to purge gas and vent LNG fuel tanks including gas piping systems. To exclude an explosive atmosphere in LNG fuel tanks and gas piping, it shall be possible to perform inerting with an inert gas (e.g. nitrogen or argon) prior to venting with dry air.

2.1.1.16 LNG fuel tanks' pressure and temperature shall be maintained at all times within their design limits.

2.1.1.17 If the LNG system is switched off, the pressure in the LNG fuel tank, shall be maintained below the maximum working pressure of the LNG fuel tank for a period of 15 days. It shall be assumed that LNG fuel tank was filled at filling limits according to (2.1.8) and that the vessel remains in idle condition.

2.1.1.18 LNG fuel tanks shall be electrically bonded to the vessel's structure.

2.1.1.19 LNG shall be stored in tanks which

a) are firmly attached to the hull; and

b) are made in a way that they are able to withstand the mechanical, chemical and thermal stresses to which they are likely to be subjected.

2.1.1.20 LNG fuel tanks and their piping and other accessories shall be laid out and arranged in such a way that neither LNG nor NG may accidentally reach the inside of the vessel.

2.1.1.21 No LNG fuel tanks may be located ahead of the collision bulkhead or aft of the aft-peak bulkhead.

2.1.1.22 LNG fuel tanks and their fittings shall not be located directly above engines or exhaust pipes.

2.1.2 LNG and NG piping systems

2.1.2.1 LNG and NG piping through other engine rooms or enclosed spaces with only non-hazardous areas of the vessel shall be double wall piping or ventilated ducting.

2.1.2.2 LNG and NG piping shall not be located less than

a) 1,00 m from the vessel’s side, and

b) 0,60 m from the bottom.

2.1.2.3 All piping and all components which can be isolated with valves from the LNG system in a liquid full condition shall be provided with pressure relief valves.

2.1.2.4 Piping shall be electrically bonded to the vessel's structure.

2.1.2.5 Low temperature piping shall be thermally isolated from the adjacent hull structure, where necessary. Protection against accidental contact shall be provided.

2.1.2.6 The design pressure of piping shall not be less than 150 % of the maximum working pressure. The maximum working pressure of piping inside rooms shall not exceed 1000 kPa. The design pressure of the outer pipe or duct of gas piping systems shall not be less than the design pressure of the inner gas pipe.

2.1.2.7 Gas piping in ESD protected engine rooms shall be located as far away as practicable from the electrical installations and tanks containing flammable liquids.

2.1.2.8 LNG and NG piping and other accessories shall be laid out and arranged in such a way that neither LNG nor NG may accidentally reach the inside of the vessel.

2.1.2.9 LNG and NG piping shall be made in a way that it is able to withstand the mechanical, chemical and thermal stresses to which it is likely to be subjected. It shall be possible to inspect it throughout its length.

2.1.3 Drainage systems

2.1.3.1 Drainage systems for areas where LNG or NG can be present shall:

a) be independent and separate from the drainage system of areas where LNG and NG cannot be present, and

b) not lead to pumps in non-hazardous areas.

2.1.3.2 Where the LNG containment system does not require a secondary barrier, suitable drainage arrangements for the tank rooms that are not connected to the engine rooms shall be provided. Means of detecting any leakage shall be provided.

2.1.3.3 Where the LNG containment system requires a secondary barrier, suitable drainage arrangements for dealing with any leakage into the inter-barrier spaces shall be provided. Means of detecting such a leakage shall be provided.

2.1.4 Drip trays

2.1.4.1 Suitable drip trays shall be fitted where leakage can cause damage to the vessel's structure or where limitation of the area which is affected from a spill is necessary.

2.1.5 Arrangement of entrances and other openings

2.1.5.1 Entrances and other openings from a non-hazardous area to a hazardous area shall only be permitted to the extent necessary for operational reasons.

2.1.5.2 For entrances and openings to a non-hazardous area within 6,00 m from the LNG containment system, the gas preparation system or the outlet of a pressure relief device, a suitable airlock shall be provided.

2.1.5.3 Air locks shall be mechanically ventilated at an overpressure relative to the adjacent hazardous area. Doors shall be of self-closing type and shall not be fitted with holding back arrangements.

2.1.5.4 Air locks shall be designed in a way that no gas can be released to non-hazardous areas in case of the most critical events in the hazardous areas separated by the air lock. The events shall be evaluated in the risk assessment according to Article 30.04.

2.1.5.5 Air locks shall be free of obstacles, shall provide easy passage and shall not be used for other purposes.

2.1.5.6 An optical and acoustic alarm shall be given on both sides of the air lock, if more than one door is not closed or if gas is detected in the air lock.

2.1.5.7 On the outer sides of doors of airlocks, a clearly visible notice shall be put up bearing the following text in red lettering on a white background:

"Luftschleuse
Hindernisfrei und Türen geschlossen halten!
Ein Alarm wird ausgelöst, falls beide Türen geöffnet sind oder Gas in der Luftschleuse auftritt."

"Sas
Gardez l'espace libre d'obstacles et les portes fermées !
Une alarme est déclenchée si les deux portes sont ouvertes ou du gaz est détecté dans le sas."

"Luchtsluis
Houd de doorgang vrij en de deuren gesloten!
Wanneer een alarm wordt gegeven, zijn beide deuren open of is er gas in de luchtsluis gas gedetecteerd."

"Airlock
Keep free of obstacles and doors closed!
An alarm is given if both doors are open or gas is detected in the airlock."

2.1.6 Ventilation systems

2.1.6.1 The ventilators used for ventilation of hazardous areas shall be of a certified safe type.

2.1.6.2 Electric engines driving ventilators shall comply with the required explosion protection in the area where they are installed.

2.1.6.3 An optical and acoustic alarm shall be triggered in the wheelhouse or at any other permanently manned location in the event of any loss of the required ventilating capacity.

2.1.6.4 Any ducting used for the ventilation of hazardous areas shall be separate from that used for the ventilation of non-hazardous areas.

2.1.6.5 Ventilation systems required to avoid any explosive atmosphere shall have at least two ventilators with independent power supply, each of sufficient capacity.

2.1.6.6 Air for ventilation of hazardous areas shall be taken from non-hazardous areas.

2.1.6.7 Air for ventilation of non-hazardous areas shall be taken from non-hazardous areas which are located at least 1,50 m from the boundaries of any hazardous area.

2.1.6.8 Where an inlet duct passes through a space with hazardous areas, the duct shall have overpressure relative to this space. Overpressure shall not be required if it is ensured that gases cannot leak into the duct.

Where an outlet duct from a hazardous area passes through a space with only non-hazardous areas, the duct shall have underpressure relative to this space. Underpressure shall not be required when structural measures on the duct ensure that gases cannot leak into the space.

2.1.6.9 Air outlets from hazardous areas shall be located in an open area which has the same or less hazard than the ventilated areas.

2.1.6.10 Air outlets from non-hazardous areas shall be located outside any hazardous area.

2.1.6.11 In enclosed rooms the air exhaust outlets shall be located at the top of these rooms. Air inlets shall be located at the bottom.

2.1.7 LNG bunkering system

2.1.7.1 The LNG bunkering system shall be arranged in such a way that

a) no gas is discharged into the atmosphere during filling of LNG fuel tanks, and

b) the quantity of gas discharged while connecting, disconnecting or purging of hoses is minimised.

2.1.7.2 Bunkering stations and all valves used for bunkering shall be located on the open deck to ensure sufficient natural ventilation in accordance with International Standards IEC 60079-10-1 : 2020 and IEC 60079-10-2 : 2015.

2.1.7.3 Bunkering stations shall be positioned and arranged in such a way that any damage to the bunkering piping does not cause damage to the vessel's LNG containment system.

2.1.7.4 Suitable means shall be provided to relieve the pressure and remove liquid contents from pump suctions and bunkering piping.

2.1.7.5 Hoses used for the bunkering of LNG shall be:

a) compatible with LNG, in particular suitable for the LNG temperature, and

b) designed for a bursting pressure not less than five times the maximum pressure they can be subjected to during bunkering.

2.1.7.6 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.

The bunkering manifold shall be suitably labelled in colour. This requirement is deemed to be fulfilled if the requirements of the international standard ISO 14726 : 2008 are met.

2.1.7.7 It shall be possible to operate the master LNG bunkering valve during bunkering operations from a safe control station on the vessel.

2.1.7.8 Bunkering piping shall be arranged for inerting and gas freeing.

2.1.7.9 Components of the bunkering system shall be in accordance with European Standard EN 20519 : 2022 (5.3 to 5.7).

2.1.8 Filling limits of LNG fuel tanks

2.1.8.1 The level of LNG in the LNG fuel tank shall not exceed the filling limit of 95 % full at the reference temperature. The reference temperature means the temperature corresponding to the vapour pressure of the fuel at the opening pressure of the pressure relief valves.

2.1.8.2 A filling limit curve for LNG filling temperatures shall be prepared from the following formula:

$$LL = FL \cdot \rho_R / \rho_L$$

where:

LL = loading limit, maximum allowable liquid volume relative to the LNG fuel tank volume to which the tank may be loaded, expressed in per cent,

FL = filling limit expressed in per cent, here 95 %,

ρR = relative density of fuel at the reference temperature,

ρL = relative density of fuel at the loading temperature.

2.1.8.3 For vessels exposed to significant wave heights or significant motion on account of operations, the filling limit curve shall be adapted accordingly, based on the risk assessment, according to Article 30.04.

2.1.9 Gas supply system

2.1.9.1 The gas supply system shall be so arranged that the consequences of any release of gas will be minimised, while providing safe access for operation and inspection.

2.1.9.2 The parts of the gas supply systems which are located outside the engine room or the fuel cell space shall be designed in a way that a failure of one barrier cannot lead to a leak from the system into the surrounding area causing immediate danger to the people on board, the environment or the vessel.

2.1.9.3 LNG fuel tank inlets and outlets shall be provided with valves located as close to the tank as possible.

2.1.9.4 Gas supply systems to individual engines or several engines shall be equipped with a master fuel valve. The valves shall be situated as close as practicable to the gas preparation system but, in any case, outside the engine room.

Gas supply systems to individual fuel cell spaces or several fuel cell spaces shall be equipped with a master fuel valve to shut-off fuel supply lines to consumer equipment. The valves shall be situated as close as practicable to the gas preparation system but, in any case, outside the fuel cell space.

The master fuel valve shall be marked in red. If the valve is concealed it shall be marked with a symbol for the “quick-closing valve on the tank” in accordance with Figure 9 of Annex 4 with a side length of at least 10 cm.

2.1.9.5 In the case of a propulsion or auxiliary system with an internal combustion engine, the master fuel valve shall be operable:

a) within and outside the engine room, and

b) from the wheelhouse.

2.1.9.6 In the case of a propulsion or auxiliary system with fuel cells, by analogy with Article 8.05(7), the master fuel valve shall be operable:

a) from the outside in the direct vicinity of the fuel cell space,

b) from the inside in case of fuel cell space referred to in (3.1.1.14.5), and

c) from the wheelhouse.

2.1.9.7 Any gas consumer equipment shall be provided with a set of double block and bleed valves to assure safe isolation of the fuel supply system. The two block valves shall be of the fail-to-close type, while the ventilation valve shall be of the fail-to-open type.

2.1.9.8 For multi-engine installations, where a separate master fuel valve is provided for each engine and for one-engine installations, the master fuel valve and the double block and bleed valve functions can be combined.

For installations with several fuel spaces, where a separate master fuel valve is provided for each fuel space and for a single fuel cell, the master fuel valve and the double block and bleed valve functions can be combined.

One shutdown valve of the double block and bleed valves shall also be manually operated.

2.1.10 Gas supply shut down

2.1.10.1 If the fuel supply is not changed over to gasoil before stopping, the gas supply system from the master fuel valve to the engine and the exhaust system shall be purged in order to discharge any residual gas which may be present.

2.1.10.2 In case of an emergency stop or a normal stop, the supply of gas shall be automatically shut off not later than

a) the supply of the other fuel for dual fuel engines. It shall not be possible to shut off the other fuel without first or simultaneously closing the gas supply to the respective cylinders or to the complete engine.

b) the ignition source for single fuel engines. It shall not be possible to shut off the ignition source without first or simultaneously closing the gas supply to the respective cylinders or to the complete engine.

2.1.10.3 In the case of a propulsion or auxiliary system with fuel cells, it shall not be possible to shut off the fuel cell system without first or simultaneously closing the gas supply.

2.1.11 Fire Safety

2.1.11.1 General

2.1.11.1.1 In addition to Article 30.08, the provisions of (2.1.11) apply.

2.1.11.1.2 A room or enclosure containing the gas preparation system or parts thereof shall be regarded as engine room for fire protection purposes.

2.1.11.2 Fire alarm system

2.1.11.2.1 Smoke detectors alone are not sufficient for rapid detection of a fire.

2.1.11.2.2 The fire alarm system shall have the means to identify each fire detector or manual call point individually.

2.1.11.2.3 The gas safety system shall shut down the relevant parts of the gas supply system automatically upon fire detection in rooms containing gas installations.

2.1.11.3 Fire protection

2.1.11.3.1 Accommodation, passenger areas, engine rooms and escape routes shall be shielded with Type A60 partitions, where the distance is less than 3,00 m to LNG fuel tanks and bunkering stations located on deck.

2.1.11.3.2 The boundaries of LNG fuel tank rooms and ventilation ducts to such rooms below the bulkhead deck shall comply with Type A60. However, where the room is adjacent to tanks, voids, auxiliary engine rooms of little or no fire risk, sanitary and similar spaces, the insulation may comply with Type A0.

2.1.11.4 Fire prevention and cooling

2.1.11.4.1 A water spray system shall be installed for cooling and fire prevention to cover exposed parts of LNG fuel tank(s) located on open deck.

2.1.11.4.2 If the water spray system is part of the firefighting systems mentioned in Articles 13.04 or 13.05, the required fire pump capacity and working pressure shall be sufficient to ensure the operation of both the required numbers of hydrants and hoses and the water spray system simultaneously. The connection between water spray system and the firefighting systems mentioned in Articles 13.04 or 13.05 shall be provided through a screw-down non-return valve.

2.1.11.4.3 If firefighting systems mentioned in Articles 13.04 or 13.05 are installed onboard a vessel where the LNG fuel tank is located on open deck, isolating valves shall be fitted in the firefighting systems in order to isolate damaged sections of the firefighting systems. Isolation of a section of firefighting systems shall not deprive the fire line ahead of the isolated section of water.

2.1.11.4.4 The water spray system shall also provide coverage for boundaries of the superstructures, unless the tank is located 3,00 m or more from the boundaries.

2.1.11.4.5 The water spray system shall be designed to cover all areas as specified above with an application rate of 10 l/min/m^2 for horizontal projected surfaces and 4 l/min/m^2 for vertical surfaces.

2.1.11.4.6 The water spray system shall be capable of being put into operation from the wheelhouse and from the deck.

2.1.11.4.7 The nozzles shall be arranged in such a way to ensure an effective distribution of water throughout the area being protected.

2.1.11.5 Fire extinguishing

2.1.11.5.1 In addition to the requirements of Article 13.03, two portable dry powder fire extinguishers with a total nominal charge of at least 12 kg shall be located near the bunkering station. They shall be suitable for Class C fires.

2.1.12 Submerged gas pump motors

2.1.12.1 Submerged gas pump motors and their supply cables may be fitted in LNG containment systems. Arrangements shall be made to alarm in low liquid level and automatically shut down the motors in the event of low-low liquid level. The automatic shutdown may be accomplished by sensing low pump discharge pressure, low motor current, or low liquid level. This shutdown shall give an optical and acoustic alarm in the wheelhouse. Gas pump motors shall be capable of being isolated from their electrical supply during gas-freeing operations.

2.1.13 Control, Monitoring and Safety Systems

2.1.13.1 General

2.1.13.1.1 In addition to Article 30.10, the provisions of (2.1.13) apply.

2.1.13.1.2 The gas supply system shall be fitted with its own gas control and gas monitoring system and its own gas safety system. All elements of these systems shall be capable of being functionally tested.

2.1.13.1.3 The gas safety system shall shut down the gas supply system automatically, upon failure in systems essential for the safety, and upon fault conditions which may develop too fast for manual intervention.

2.1.13.2 LNG bunkering system and LNG containment system monitoring

2.1.13.2.1 Each LNG fuel tank shall be fitted with:

a) at least two liquid level indicators, which shall be arranged so that they can be maintained in an operational condition,

b) a pressure indicator capable of indicating throughout the operating pressure range and which is clearly marked with the maximum working pressure of the LNG fuel tank,

c) a high liquid level alarm operating independently of other liquid level indicators which shall give an optical and acoustic alarm when activated, and

d) an additional sensor operating independently of the alarm referred to in c) which shall automatically actuate the master LNG bunkering valve in a manner that will both avoid excessive liquid pressure in the bunkering piping and prevent the tank from becoming liquid full.

2.1.13.2.2 Each pump discharge line and each liquid and vapour gas shore connection shall be provided with at least one local pressure indicator. In the pump discharge line, the indicator shall be placed between the pump and the first valve. The permissible maximum pressure or vacuum value shall be indicated on each indicator.

2.1.13.2.3 A high-pressure alarm shall be provided at the LNG containment system and at the pump. Where vacuum protection is required, a low-pressure alarm shall be provided.

2.1.13.2.4 Control of the bunkering shall be possible from a safe control station remote from the bunkering station. At this control station the LNG fuel tank pressure and level shall be monitored. Overfill alarm, high and low-pressure alarm and automatic shutdown shall be indicated at this control station.

2.1.13.2.5 If the ventilation in the ducting enclosing the bunkering lines stops, an optical and acoustic alarm shall be actuated at the control station.

2.1.13.2.6 If gas is detected in the ducting enclosing the bunkering piping an optical and acoustic alarm and emergency shutdown shall be actuated at the control station.

2.1.13.2.7 Appropriate and sufficient suitable protective clothing and equipment for bunkering operations shall be available on board according to operating manual.

2.1.13.3 Gas warning equipment

2.1.13.3.1 Gas warning equipment shall be designed, installed and tested in accordance with a recognised Standard, such as European Standard EN 60079-29-1 : 2020.

2.1.13.3.2 Permanently installed gas detectors shall be provided for:

a) tank connection areas including LNG fuel tanks, pipe connections and first valves,

b) ducts around gas piping,

c) engine rooms containing gas piping, gas equipment or gas consumer equipment,

d) the room containing the gas preparation system,

e) other enclosed rooms containing gas piping or other gas equipment without ducting,

f) other enclosed or semi-enclosed rooms

aa) where gas vapours may accumulate including inter-barrier spaces and

bb) tank rooms of independent LNG fuel tanks other than type C,

g) air locks, and

h) air outlets of rooms in which gas vapours may accumulate.

2.1.13.3.3 By derogation to (2.1.13.3.2), permanently installed sensors which detect gas by difference of pressure can be used for inter-barrier spaces in double wall piping.

2.1.13.3.4 The number and redundancy of gas detectors in each room shall be considered taking size, layout and ventilation of the room into account.

2.1.13.3.5 Permanently installed gas detectors shall be located where gas may accumulate and in the ventilation outlets of these rooms.

2.1.13.3.6 An optical and acoustic alarm shall be activated before the gas concentration reaches 20 % of the lower explosive limit (LEL). The gas safety system shall be activated at 40 % of the LEL.

2.1.13.3.7 Optical and acoustic alarms from the gas warning equipment shall be actuated in the wheelhouse.

2.1.13.4 Safety functions of gas supply systems

2.1.13.4.1 If the gas supply system is shut off due to activation of an automatic valve, it shall not be restarted until the reason for the disconnection is ascertained and the necessary actions taken. Instructions to this effect shall be placed in a prominent position at the control station for the shut-off valves in the gas supply lines.

2.1.13.4.2 If the gas supply system is shut off due to a gas leak, it shall not be opened until the leak has been found and the necessary actions have been taken. Instructions to this effect shall be placed in a prominent position in the engine room.

2.1.13.4.3 The gas supply system shall be arranged for manual remote emergency stop from the following locations as applicable:

a) wheelhouse,

b) control station of the bunkering station, or

c) any permanently manned location.

Chapter 2
Methanol

2.2.1 General

2.2.1.1 Equipment or piping containing liquid methanol fuel shall be arranged in enclosures, spaces or ducts providing a secondary barrier. This requirement applies notably to pump, filters and fittings.

No secondary barrier is required on open deck.

2.2.2 Methanol fuel tanks

2.2.2.1 Methanol fuel shall be stored in tanks which

a) are either an integral part of the hull or which are firmly attached to the hull;

b) are made in a way that they are able to withstand the mechanical, chemical and thermal stresses to which they are likely to be subjected;

c) have no common partitions with drinking-water tanks.

Materials other than steel may be used for methanol fuel tanks (consisting of primary barrier and where applicable secondary barrier), provided that these materials have structural and integrity properties equivalent to steel, at the end of the applicable fire exposure according to the standard one-hour fire test. These requirements are deemed fulfilled when the materials used provide Type A60 partitions.

2.2.2.2 Methanol fuel tanks and their piping shall be designed to prevent electrostatic charges. Independent fuel tanks shall be electrically bonded to the vessel's structure.

2.2.2.3 Methanol fuel tanks and their piping and other accessories shall be laid out and arranged in such a way that neither fuel nor fuel vapours may accidentally reach the inside of the vessel. Tank valves intended for fuel sampling or water drainage shall close automatically.

2.2.2.4 No methanol fuel tanks may be located ahead of the collision bulkhead or aft of the aft-peak bulkhead.

2.2.2.5 Methanol fuel tanks and their fittings shall not be located directly above engines or exhaust pipes.

2.2.2.6 Directly at tank outlets, the pipework for the supply of fuels shall be fitted with a quick-closing valve that can be operated from the deck, even when the spaces in question are closed.

If the operating device is concealed, the lid or cover shall not be lockable.

The operating device shall be marked in red. If the device is concealed it shall be marked with a symbol for the “quick-closing valve on the tank” in accordance with Figure 9 of Annex 4 with a side length of at least 10 cm.

2.2.2.7 Methanol fuel tanks shall be safeguarded against fuel spills during bunkering by means of appropriate onboard technical devices which shall be entered in item 52 of the inland navigation vessel certificate. Derogation from this requirement is acceptable if fuel is taken on from bunkering stations with their own technical devices to prevent fuel spills on board during bunkering.

2.2.2.8 A fixed piping system shall be arranged to allow safe gas freeing of each fuel tank.

2.2.2.9 Methanol fuel tanks shall be provided with openings having gastight closures that are intended to permit cleaning and inspection.

2.2.3 Inerted methanol fuel tanks

2.2.3.1 Inerted methanol fuel tanks shall be inerted at all times during normal operation.

2.2.3.2 The design of the inerted tank system shall eliminate the possibility of an explosive atmosphere in the fuel tank, during any part of the gas change, gas-freeing or inerting operation by using an inerting medium.

2.2.3.3 According to (2.2.1.1), if inerted methanol fuel tanks are located below deck, they shall be surrounded by a secondary barrier for leakage containment and detection. However, the secondary barrier can be omitted on those surfaces bound by

a) shell plating,

b) tank tops which are not under the static pressure of the liquid and facing open deck,

c) tank tops which are not under the static pressure of the liquid and facing spaces permanently ventilated with at least 15 air changes per hour (e.g. engine rooms, pump rooms or similar), or

d) other methanol fuel tanks or spaces with equipment containing methanol fuel.

2.2.3.4 For inerted methanol fuel tanks below deck,

a) the distance between the vessel's side (shell plating) and the secondary barrier of the tank shall be at least 0,60 m and

b) the distance between the vessel's bottom (shell plating) and the secondary barrier of the tank shall be at least 0,50 m.

For the case referred to in (2.2.3.3)(a), this means:

a) the distance between the vessel's side (shell plating) and the vertical part of the secondary barrier of the tank opposite to the vessel's side, shall be at least 0,60 m.

b) the distance between the vessel's bottom (shell plating) and the horizontal part of the upper secondary barrier of the tank, opposite to the vessel's bottom, shall be at least 0,50 m.

Because the boundaries of the spaces referred to in (2.2.3.3)(c) and (d) act as secondary barrier,

a) the distance between the vessel's side (shell plating) and the boundaries of these spaces shall be at least 0,60 m and

b) the distance between the vessel's bottom (shell plating) and the boundaries of these spaces shall be at least 0,50 m.

In accordance with the risk assessment referred to in Article 30.04, the inspection body might require greater values for the distances mentioned above.

2.2.3.5 For inerted methanol fuel tanks on open deck, the distance between the vertical planes defined by the vessel's sides (shell plating) and the tank shall be at least 0,60 m.

2.2.4 Non-inerted methanol fuel tanks

2.2.4.1 In accordance with (2.2.1.1), if non-inerted methanol fuel tanks are located below deck, they shall be surrounded by a secondary barrier for leakage containment and detection. However, the secondary barrier can be omitted on those surfaces bound by

a) shell plating below the lowest possible waterline, or

b) other methanol fuel tanks or spaces with equipment containing methanol fuel.

2.2.4.2 For non-inerted methanol fuel tanks below deck,

a) the distance between the vessel's side (shell plating) and the secondary barrier of the tank shall be at least 0,60 m and

b) the distance between the vessel's bottom (shell plating) and the secondary barrier of the tank shall be at least 0,50 m.

For the case referred to in (2.2.4.1)(a), this means:

a) the distance between the vessel's side (shell plating) and the vertical part of the secondary barrier of the tank opposite to the vessel's side, shall be at least 0,60 m.

b) the distance between the vessel's bottom (shell plating) and the horizontal part of the upper secondary barrier of the tank, opposite to the vessel's bottom, shall be at least 0,50 m.

c) the distance between the vessel's side (shell plating) and the tank, above the lowest possible waterline, shall be at least 0,60 m.

Because the boundaries of the spaces referred to in (2.2.4.1)(b) act as secondary barrier,

a) the distance between the vessel's side (shell plating) and the boundaries of these spaces shall be at least 0,60 m and

b) the distance between the vessel's bottom (shell plating) and the boundaries of these spaces shall be at least 0,50 m.

In accordance with the risk assessment referred to in Article 30.04, the inspection body might require greater values for the distances mentioned above.

2.2.4.3 For non-inerted methanol fuel tanks on open deck, the distance between the vertical planes defined by the vessel's sides (shell plating) and the tank shall be at least 0,60 m.

2.2.5 Tank venting systems

2.2.5.1 Tank venting systems for fuel vapours shall be designed and arranged in such a way that releases are safely led overboard and do not lead to an unsafe situation.

Vent lines shall be designed and arranged in such a way that neither fuel nor fuel vapours may accidentally reach the inside of the vessel.

2.2.5.2 Design and arrangement of tank venting systems shall prevent flame propagation into the fuel containment system. Each tank shall be protected by a suitable flame arrestor. Where the venting lines cannot withstand the deflagration, pressure flame screens shall be fitted to the overboard outlet.

2.2.5.3 Tank venting systems shall be sized to permit bunkering at nominal loading rate without overpressurising the fuel tanks.

2.2.5.4 The tank vent outlets shall be arranged in such a way that no water ingress is possible.

2.2.5.5 In the tank vent lines, no shut-off valves shall be installed. For tank segregation purposes during maintenance work, shut-off valves in common vent lines may be accepted if a secondary independent overpressure or underpressure protection is provided for all connected tanks.

2.2.5.6 If a controlled tank venting system is provided for the fuel tanks:

a) Pressure Vacuum (P/V) valves (combined or separate valves) shall be fitted to each fuel tank. The controlled tank venting system may be designed with individual vent outlets from each fuel tank or with vent lines from each individual fuel tank connected to a common header; and

b) The controlled tank venting system shall be designed with redundancy for the relief of full flow overpressure and/or underpressure. As alternative to this redundancy, the inspection body may accept pressure sensors fitted in each fuel tank and connected to an alarm system.

2.2.5.7 The vent lines below deck shall be either:

a) located at least 0,60 m from the vessel’s side (shell plating); or

b) surrounded by a secondary barrier. The distance between the vessel’s side (shell plating) and the vertical part of the secondary barrier of the vent line opposite to the vessel’s side shall be at least 0,60 m.

If vent lines pass through accommodations, only double wall piping is allowed.

2.2.6 Methanol fuel piping systems

2.2.6.1 Methanol fuel piping shall be electrically bonded to the vessel's structure.

2.2.6.2 Methanol fuel piping and other accessories shall be laid out and arranged in such a way that neither fuel nor fuel vapours may accidentally reach the inside of the vessel.

2.2.6.3 In accordance with (2.2.1.1), below deck, methanol fuel piping shall be surrounded by a secondary barrier for leakage containment and detection.

2.2.6.4 The horizontal distance between the secondary barrier of methanol fuel piping below deck and the vessel’s side (shell plating) shall be at least 0,60 m.

In accordance with the risk assessment referred to in Article 30.04, the inspection body might require greater values for the distance mentioned above.

2.2.6.5 The design pressure of the secondary barrier around a fuel pipe shall not be less than the maximum working pressure of the fuel pipe. As an alternative the secondary barrier around a fuel pipe shall be dimensioned in accordance with the calculated maximum built-up pressure in the case of a pipe rupture.

2.2.6.6 In accordance with (2.2.1.1), on open deck, a secondary barrier is not required, however:

a) single walled methanol fuel piping shall be located as far away as practicable from the electrical installations, sources of ignition, and tanks containing flammable liquids;

b) the number of connections of fuel pipes shall be kept to a minimum; and

c) where necessary, connections of fuel pipes shall be screened or otherwise suitably protected to avoid fuel spray or leakages onto hot surfaces, into machinery air intakes, or other sources of ignition.

2.2.6.7 All pumps in the fuel system shall be protected against running dry (i.e. protected against operation in the absence of fuel or service fluid).

All pumps which are capable of developing a pressure exceeding the design pressure of the system shall be provided with pressure relief valves. Each pressure relief valve shall be in closed circuit, i.e. arranged to discharge back to the piping upstream of the suction side of the pump.

2.2.6.8 The design pressure for any section of the fuel piping system is the maximum gauge pressure to which the system may be subjected in service, taking into account the highest set pressure on any pressure relief device on the system.

2.2.6.9 For maintenance, it shall be possible that all sections of the fuel system can be safely

a) isolated, and

b) drained and purged of fuel.

2.2.6.10 Methanol fuel piping shall be made in a way that it is able to withstand the mechanical, chemical and thermal stresses to which it is likely to be subjected. It shall be possible to inspect it throughout its length.

2.2.7 Drainage systems and drip trays

2.2.7.1 Suitable drainage and purging arrangements shall be provided for dealing with any leakage of methanol fuel into the interbarrier spaces.

2.2.7.2 Drainage systems for areas where methanol fuel can be present shall be independent and separate from the drainage system of areas where methanol fuel cannot be present.

2.2.7.3 For the purpose of draining methanol leakages from interbarrier spaces, provisions shall be made such that the leakages can be drained into suitable mobile or fixed collecting tanks or be lead directly overboard below the lowest possible waterline.

2.2.7.4 Leakage on open deck from single walled tanks or fuel containing equipment shall be contained and drained by a dedicated drain discharging below the lowest possible waterline.

2.2.8 Arrangement of entrances and other openings

2.2.8.1 Access to a space with hazardous areas shall not be possible before

a) the fuel components and piping inside are safely shut down, and

b) the inside atmosphere is confirmed gas-free by the means of sensors.

All controls and all parameters required for safe operation of the fuel system and gas freeing of the space shall be remotely operated and monitored from outside the space.

2.2.8.2 Doors or hatches to spaces with hazardous areas shall bear on the outside the symbol corresponding to Figure 1 in Annex 4 (“No entry for unauthorised persons”) as well as the fuel specific symbol in accordance with Article 30.06.

2.2.8.3 The inspection body may allow derogation to (2.2.8.1), provided that

a) the opening of the space leads directly to open deck;

b) the opening of the space is through an air lock;

c) the space is considered as non-hazardous area in accordance with Article 10.04; or

d) the entering of the space does not lead to extending any hazardous area to where a source of ignition is present.

Before allowing a derogation according to d), a classification and evaluation of hazardous areas in accordance with Article 10.04 shall be conducted with accesses opened. Spaces with only non-hazardous areas to which a hazardous area could extend while accessing the spaces shall be appropriately marked.

2.2.8.4 Air locks shall be mechanically ventilated at an overpressure relative to the adjacent hazardous area. Doors shall be of self-closing type and shall not be fitted with holding back arrangements.

2.2.8.5 Air locks shall be designed in a way that no gas can be released to non-hazardous areas in case of the most critical events in the hazardous areas separated by the air lock. The events shall be evaluated in the risk assessment according to Article 30.04.

2.2.8.6 Air locks shall be free of obstacles, shall provide easy passage and shall not be used for other purposes.

2.2.8.7 An optical and acoustic alarm shall be given on both sides of the air lock, if more than one door is not closed or if gas is detected in the air lock.

2.2.8.8 On the outer sides of doors of airlocks, a clearly visible notice shall be put up bearing the following text in red lettering on a white background:

“Luftschleuse

Hindernisfrei und Türen geschlossen halten!

Ein Alarm wird ausgelöst, falls beide Türen geöffnet sind oder Gas in der Luftschleuse auftritt.“

“Sas

Gardez l'espace libre d’obstacles et les portes fermées !

Une alarme est déclenchée si les deux portes sont ouvertes ou du gaz est détecté dans le sas."

“Luchtsluis

Houd de doorgang vrij en de deuren gesloten!

Wanneer een alarm wordt gegeven, zijn beide deuren open of is er gas in de luchtsluis gas gedetecteerd.“

“Airlock

Keep free of obstacles and doors closed!

An alarm is given if both doors are open or gas is detected in the air lock.”

2.2.9 Ventilation systems

2.2.9.1 Any ducting used for the ventilation of hazardous areas shall be separate from that used for the ventilation of non-hazardous areas.

2.2.9.2 The ventilators used for ventilation of hazardous areas shall be of a certified safe type.

2.2.9.3 Electric engines driving ventilators shall comply with the required explosion protection in the area where they are installed.

2.2.9.4 An optical and acoustic alarm shall be triggered in the wheelhouse or at any other permanently manned location in the event of any loss of the required ventilating capacity.

2.2.9.5 Ventilation systems required to avoid any explosive atmosphere shall have at least two ventilators with independent power supply, each of sufficient capacity. This requirement does not apply for ventilation of spaces that do not require continuous ventilation.

2.2.9.6 It shall be possible to safely ventilate overboard the spaces where methanol fuel may accumulate to ensure a safe atmosphere when entering the spaces is necessary.

2.2.9.7 Air for ventilation of hazardous areas shall be taken from non-hazardous areas.

2.2.9.8 Air for ventilation of non-hazardous areas shall be taken from non-hazardous areas which are located at least 1,50 m from the boundaries of any hazardous area.

2.2.9.9 Where an outlet duct from a hazardous area passes through a space with only non-hazardous areas, the duct shall have underpressure relative to this space. Underpressure shall not be required when structural measures on the duct ensure that gases cannot leak into the space.

2.2.9.10 Where an inlet duct passes through a space with hazardous areas, the duct shall have overpressure relative to this space. Overpressure shall not be required if it is ensured that gases cannot leak into the duct.

2.2.9.11 Air outlets from hazardous areas shall be located in an open area which has the same or less hazard than the ventilated areas.

2.2.9.12 Air outlets from non-hazardous areas shall be located outside any hazardous area.

2.2.10 Methanol bunkering system

2.2.10.1 Bunkering stations shall be located on open deck to ensure sufficient natural ventilation in accordance with International Standards IEC 60079-10-1 : 2020 and IEC 60079-10-2 : 2015. However, the inspection body may accept enclosed or semi-enclosed bunkering stations subject to special consideration with respect to provisions for mechanical ventilation.

2.2.10.2 Bunkering stations shall be positioned and arranged in such a way that any damage to the methanol bunkering piping does not cause damage to the vessel's methanol tank system.

2.2.10.3 Suitable means shall be provided to relieve the pressure and remove liquid contents from bunkering piping.

2.2.10.4 Each fuel tank filler neck shall be designed to withstand the mechanical loads during bunkering.

The filler neck shall be suitably labelled in colour. This requirement is deemed to be fulfilled if the requirements of the international standard ISO 14726 : 2008 are met.

2.2.10.5 The coupling of the bunkering system shall be in accordance with European Standard EN 14420-6 : 2013.

The need for a safety dry break-away coupling shall be considered in the risk assessment in accordance with Article 30.04.

2.2.11 Methanol fuel supply system

2.2.11.1 The methanol fuel supply system to each room or space with consumer equipment shall be equipped with a remotely controlled master fuel valve to shut-off fuel supply lines to consumer equipment. The master fuel valve shall be situated outside the room or space where the consumer equipment is located. For tanks serving only one room or space, the master fuel valve may be combined with the quick closing tank valve.

2.2.11.2 The master fuel valve shall be operable

a) within and outside the engine room (if present),

b) from the inside and outside of the fuel cell space (if present), and

c) from the wheelhouse.

2.2.11.3 The arrangement of the methanol fuel supply system shall ensure safe isolation during maintenance work.

2.2.12 Fire Safety

2.2.12.1 In addition to Article 30.08, the provisions of (2.2.12) apply.

2.2.12.2 Spaces, where equipment containing fuel is installed and where a fire hazard cannot be excluded, shall comply with the fire protection requirements for engine rooms. These requirements are deemed fulfilled when:

a) walls, ceilings, doors and hatches of this space is made of steel or another equivalent non-combustible material;

b) insulation material used in this space is protected against the intrusion of fuel and fuel vapours;

c) all openings in walls, ceilings, doors and hatches of this space can be closed from outside the space. The locking devices shall be made from steel or an equivalent non-combustible material; and

d) this space is equipped with a permanently installed firefighting system in accordance with Articles 13.05 or 13.06.

The firefighting system referred to in (d) is not required in small enclosed spaces which do not contain source of ignition.

Continuously operated electric engines, even if certified as safe according to Article 1.01(3.29), shall be considered a source of ignition, unless they are protected against overheating.

2.2.12.3 Suitable fire detectors shall be selected based on the characteristics of the fuel. Smoke detectors shall be used only in combination with other detectors which can more effectively detect methanol fires.

2.2.12.4 The fire detection system shall have the means to identify each detector individually.

2.2.12.5 At least one portable fire extinguisher in accordance with Article 13.03(2) shall be available on deck no more than 10 m walking distance away from each bunkering stations.

2.2.13 Control, Monitoring and Safety Systems

2.2.13.1 General

2.2.13.1.1 In addition to Article 30.10, the provisions of (2.2.13) apply.

2.2.13.1.2 Without prejudice to Article 30.07, upon failure in systems essential for the safety and upon fault conditions which may develop too fast for manual intervention, the methanol fuel safety system shall shut down the fuel supply system automatically.

2.2.13.1.3 The safety functions shall be arranged in a dedicated fuel safety system that is independent of the fuel control system.

2.2.13.1.4 Instrumentation devices shall be fitted to allow a local and a remote reading of essential parameters, where they are necessary to ensure a safe operation of the whole methanol fuel system including the bunker system.

2.2.13.1.5 It shall be possible to manually shut down the methanol fuel supply system from the wheelhouse or a permanently manned location as applicable.

2.2.13.2 Methanol fuel tank and bunkering system

2.2.13.2.1 Each methanol fuel tank shall be fitted with:

a) at least one closed level gauging device, which must be positioned close to the tank in such a way that the level reading is always obtainable;

b) an independent sensor (high-high level) triggering an optical and acoustic alarm and allowing to automatically stop the bunkering at 95 % full; and

c) an optical and acoustic high-level alarm. This shall be able to be functionally tested from the outside of the tank and can be common with the alarm of the level gauging device according to (a), configured as an alarm on the gauging transmitter, but shall be independent of the high-high level alarm according to (b).

2.2.13.2.2 A ship-shore link shall be fitted for automatic and manual transmission of the bunkering stop order to the bunkering source.

At least the signal of the high-high level sensor shall be transmitted to the bunkering station by means of a watertight connection plug meeting the requirements of International Standard IEC 60309-1 : 2021 for 40 to 50 V DC, housing colour white, earthing contact position ten o'clock.

2.2.13.2.3 Provisions shall be made that the bunkering can be monitored and stopped at any time. Overfill alarm and automatic shutdown shall be indicated.

2.2.13.2.4 If a leakage into the interbarrier space of the bunkering line is detected, an optical and acoustic alarm and automatic shutdown of the bunkering shall be initiated.

2.2.13.2.5 Each shore connection for liquids and vapours shall be provided with at least one local pressure indicator. The permissible maximum pressure or vacuum value shall be indicated on each indicator.

2.2.13.2.6 For inerted tanks, means shall be provided that the tanks cannot be overpressurised by the inert gas system.

2.2.13.3 Gas and leakage warning equipment

2.2.13.3.1 Spaces where methanol fuel vapours may accumulate shall be equipped with permanently installed means of fuel leakage detection.

The number, type and redundancy of detectors in each space shall correspond to the size, layout and ventilation of the space.

The effectiveness of leakage detection shall be demonstrated. For gas detectors, this is deemed fulfilled when a gas dispersal analysis or a physical smoke test is used to find the best arrangement.

2.2.13.3.2 Permanently installed gas detection shall be provided for:

a) enclosed or semi-enclosed rooms,
   aa) where fuel vapours may accumulate, and
   bb) which contain a source of ignition.
b) air locks, and
c) air outlets of ventilated spaces where a fuel leakage could remain undetected in the space.

2.2.13.3.3 Gas warning equipment shall be designed, installed and tested in accordance with a Standard recognized by one of the Member States, such as European Standard EN 60079-29-1 : 2020.

2.2.13.3.4 In the event of a fuel vapour concentration above 20 % of the LEL, an optical and acoustic alarm shall be triggered in the wheelhouse or at any other permanently manned location.

The automatic shutdown required by (2.2.13.1.2) shall be activated at the latest at a fuel vapour concentration of 40 % of the LEL.

2.2.13.4 Provisions on safety functions of fuel supply systems

2.2.13.4.1 The safety system shall be manually reset before the propulsion or auxiliary system can be restarted.

Chapter 3
Gaseous Hydrogen (GH_2)

2.3.1 GH_2 containment systems

2.3.1.1 General

2.3.1.1.1 GH_2 containment systems shall be provided with a secondary barrier. No secondary barrier is required for containment systems where the probability for structural failures is extremely low and can be neglected.

2.3.1.1.2 The location and construction of the GH_2 containment systems shall assure sufficient ventilation in accordance with International Standards IEC 60079-10-1 : 2020 and IEC 60079-10-2 : 2015 and prevent accumulation of escaped GH_2. Alternatively, the interbarrier spaces of the GH_2 containment systems shall be inerted.

2.3.1.1.3 In accordance with Article 10.04(4), the boundaries of hazardous areas surrounding GH_2 containment systems shall be marked on deck.

2.3.1.1.4 GH_2 containment systems shall be separated from engine rooms or other high fire risk areas.

2.3.1.1.5 GH_2 containment systems shall not be installed in the cargo hold.

2.3.1.1.6 GH_2 containment systems shall be located as close as possible to the longitudinal centreline of the vessel.

2.3.1.1.7 GH_2 containment systems shall be

a) protected against the risk of mechanical damage due to collision and

b) at a suitable distance from the ship's hull.

Letter(b) is deemed fulfilled when the GH_2 containment system is not located less than:

a) 1,00 m or B/5 from the vessel's side whichever is less, and

b) 0,60 m from the vessel's bottom.

When the GH_2 containment system is located below deck, the vessel shall have a double side and a double bottom at the location of the GH_2 containment system.

The inspection body may allow shorter distances in the absence of hazardous areas, based on the risk assessment, according to Article 30.04. The risk assessment shall provide validated evidence for risks and mitigation measures. It shall also follow a risk mitigation approach in sequence of priority and use: passive protection/mitigation, active protection/mitigation. Alarm mitigation and procedural mitigation are not acceptable measures in this case.

2.3.1.1.8 GH_2 containment systems shall be protected against damage caused by lightning.

2.3.1.1.9 GH_2 containment systems shall store GH_2 in tanks which are firmly attached to the hull or in swappable tanks. Swappable tanks shall be attached to the vessel (e.g. with twist locks).

2.3.1.1.10 Locations of GH_2 tanks shall

a) prevent flooding due to ingress of water due to rain or marine conditions;

b) minimise the probability of mechanical damage of the GH2 tanks from cargo or any other operations on board of the vessel;

c) provide safe access to all parts of the GH_2 tanks that need to be visually inspected or operated by the crew.

2.3.1.1.11 Partitions of enclosed and semi-enclosed rooms in which GH_2 tanks are stored shall be gastight towards all adjacent enclosed rooms. Enclosed rooms in which fixed or swappable tanks are stored shall be inerted or ventilated in accordance with (2.3.1.1.2) and equipped with a gas detector.

2.3.1.1.12 GH_2 containment systems shall be laid out and arranged in such a way that no GH_2 may accidentally reach the inside of the vessel.

2.3.1.2 Design and inspection of GH_2 tanks

2.3.1.2.1 For permanently installed and swappable GH_2 tanks, (2.3.1.2.2) to (2.3.1.2.8) apply.

2.3.1.2.2 The design of GH_2 tanks, cylinders of GH_2 tanks and their integration on board the vessel must consider the following loads and impacts:

a) Operational and environmental loads and impacts

aa) Loads due to inside pressure,

bb) Thermally induced loads,

cc) Loads and impacts due to vibration,

dd) Loads due to hull deformation,

ee) Gravity loads,

ff) Loads and impacts due to wind,

gg) Loads and impacts due to waves, if the vessel operates in Zone 1 or 2 waterways,

hh) Loads and impacts due to snow and ice,

ii) Loads and impacts due to swapping operation,

jj) Loads and impacts due to sun radiation (UV),

kk) Impacts due to corrosion.

b) Accidental loads and impacts

aa) Loads due to collisions, using the following accelerations (where g means gravitational acceleration):

- in forward direction: 2g,
- in aft direction: 1g,
- in side direction: 1g,

bb) Loads and impacts due to flooding of the vessel,

cc) Impacts due to fire,

dd) Loads and impacts due to accidents during operation of the vessel.

c) Loads associated with construction and installation of the system.

2.3.1.2.3 Cylinders of GH_2 tanks shall be designed in accordance with one of the following standards:

a) EN 17339 : 2020,

b) ISO 11119-1 : 2020,

c) ISO 11119-2 : 2020,

d) ISO 11119-3 : 2020,

e) ISO 11515 : 2013 (as amended in 2018),

f) EN 12245 : 2022 or

g) EN 12257 : 2002.

2.3.1.2.4 Closures of GH_2 tanks shall be conforming to one of the following standards:

a) EN ISO 23826 : 2021,

b) EN ISO 17879 : 2017 or

c) EN ISO 10297 : 2014 + A1:2017 in combination with EN ISO 14246 : 2022.

2.3.1.2.5 Cylinders of GH_2 tanks shall be periodically inspected in accordance with Article 8.01(2) and EN ISO 11623 : 2023.

Closures of GH_2 tanks shall be periodically inspected in accordance with EN ISO 22434 : 2022.

2.3.1.2.6 For swappable tanks, the compliance with (2.3.1.2.3) to (2.3.1.2.5) is deemed as fulfilled, if they comply with (2.3.1.2.2) and are authorised and regularly inspected as prescribed for the transport of dangerous goods as

a) UN multiple-element gas containers (UN-MEGC) in accordance with Chapter 6.7 of the ADR,

b) tank container, tank swap bodies, multiple element gas container (MEGC) in accordance with Chapter 6.8 of the ADR or

c) pressure receptacles in accordance with Chapter 6.2 of the ADR.

2.3.1.2.7 Frames of swappable tanks shall include attachment points for facilitating salvage in case of them going accidentally overboard.

2.3.1.2.8 GH_2 tanks shall be electrically bonded to the vessel's structure.

2.3.1.2.9 No GH_2 tanks may be located ahead of the collision bulkhead or aft of the aft-peak bulkhead.

2.3.1.3 Safety valves

2.3.1.3.1 Each GH_2 tank shall be protected against tank rupture by overpressure. This requirement is deemed fulfilled when the GH_2 tank is fitted with one or more pressure relief devices (PRV and/or TPRD). The number and type of pressure relief devices shall be verified by the risk assessment according to Article 30.04 considering the number and type (I, II, III, IV) of cylinders as well as the configuration of the GH_2 containment system (including the discharge capabilities).
If a GH_2 tank consists of several gas cylinders, the requirement applies to each cylinder. To reduce the number of connections, the cylinders may be connected in groups, including the shut-off and relief capabilities.

2.3.1.3.2 The design of the GH_2 containment system and venting system shall ensure that in case of exposure to external fire the GH_2 stored is safely discharged before the cylinders burst. The total amount of GH_2 that can be discharged and the corresponding discharge time shall be verified in the risk assessment according to Article 30.04 and based on

a) the worst-case scenario in terms of exposure of GH_2 tanks to external fire or mechanical damage as determined in the risk assessment;

b) the performance of the GH_2 cylinders and associated PRD (as certified according to the selected recognised standard taking into account the results of the bonfire test); and

c) the routing and design of the venting system (e.g. pressure drop calculation).

The above-mentioned discharge time shall be mentioned in the operating manual referred to in Article 30.05(5).

2.3.1.3.3 If GH_2 tanks are located in enclosed or semi enclosed rooms, the pressure relief devices shall be connected to a venting system.

2.3.1.3.4 Without prejudice to (2.3.9.4.1), the outlets of venting lines from pressure relief devices (PRV and TPRD) shall be located at a horizontal distance of not less than 1,50 m from

a) accommodations,

b) passenger areas,

c) engine rooms,

d) escape routes, and

e) work stations, which are located outside the hold or the cargo area.

The inspection body may allow shorter distances, based on the risk assessment, according to Article 30.04. The risk assessment shall provide validated evidence for risks and mitigation measures.

2.3.1.3.5 The venting lines of GH_2 containment systems shall

a) comply with (2.3.1.1.1),

b) not be connected to any other system,

c) lead the gases to open air.

By way of derogation from (b), a venting line can be connected to another venting line of a GH_2 containment system, if a back pressure calculation proves that the functioning of any pressure relief device (PRV and TPRD) is not negatively affected.

2.3.1.3.6 The provisions of (2.3.1.3.4) and (2.3.1.3.5) apply mutatis mutandis to outlets of pressure relief devices (PRV and TPRD) which are not connected to venting lines.

2.3.1.3.7 The pressure and temperature of GH_2 containment systems shall be maintained at all times within their design limits.

2.3.1.4 GH_2 tanks discharge and purge

2.3.1.4.1 It shall be possible to safely discharge the hydrogen from GH_2 tanks, even if the GH_2 system is shut down.

2.3.1.4.2 It shall be possible to purge gas and vent GH_2 tanks including gas piping systems. To exclude an explosive atmosphere in GH_2 tanks and gas piping, it shall be possible to perform inerting with an inert gas (e.g. nitrogen or argon) prior to venting with dry air.

2.3.2 GH_2 piping systems

2.3.2.1 GH_2 piping through engine rooms or fuel cell spaces, other than the one from where the GH_2 is originating or for which the GH_2 is destined, or through enclosed spaces with only non-hazardous areas of the vessel shall be double wall piping or ventilated ducting.

2.3.2.2 GH_2 piping shall not be located less than:

a) 1,00 m or B/5 from the vessel’s side whichever is less, and

b) 0,60 m from the vessel’s bottom.

The inspection body may allow shorter distances in the absence of hazardous areas, based on the risk assessment, according to Article 30.04. The risk assessment shall provide validated evidence for risks and mitigation measures. It shall also follow a risk mitigation approach in sequence of priority and use: passive protection/mitigation, active protection/mitigation. Alarm mitigation and procedural mitigation are not possible measures in this case.

2.3.2.3 GH_2 piping shall be electrically bonded to the vessel's structure.

2.3.2.4 The design pressure of GH_2 piping shall not be less than 150 % of the maximum working pressure. The maximum working pressure of GH_2 piping inside rooms shall not exceed 5000 kPa. The design pressure of the outer pipe or duct of gas piping systems shall not be less than the design pressure of the inner gas pipe.

2.3.2.5 GH_2 piping and other accessories shall be laid out and arranged in such a way that no GH_2 may accidentally reach the inside of the vessel.

2.3.2.6 GH_2 piping shall be made in a way that it is able to withstand the mechanical, chemical and thermal stresses to which it is likely to be subjected. It shall be possible to inspect it throughout its length.

2.3.3 Arrangement of entrances and other openings

2.3.3.1 Entrances and other openings from a non-hazardous area to a hazardous area shall only be permitted to the extent necessary for operational reasons.

2.3.3.2 For entrances and openings to a non-hazardous area within 1,50 m from

a) the GH_2 containment system,

b) the gas preparation system or

c) the outlet of a pressure relief device,

a suitable airlock shall be provided.

Alternatively, for entrances and openings from the open deck to non-hazardous areas, to prevent the ingress of hydrogen in the non-hazardous area, the airlock can be replaced by a protection wall which provides a gas and liquid-tight barrier.
The protection wall shall be designed in a way that no gas can be released to non-hazardous areas in case of the most critical events in the hazardous areas separated by the protection wall. The events shall be evaluated in the risk assessment according to Article 30.04.

2.3.3.3 Airlocks shall be mechanically ventilated at an overpressure relative to the adjacent hazardous area. Doors shall be of self-closing type and shall not be fitted with holding back arrangements.

2.3.3.4 Airlocks shall be designed in a way that no gas can be released to non-hazardous areas in case of the most critical events in the hazardous areas separated by the air lock. The events shall be evaluated in the risk assessment according to Article 30.04.

2.3.3.5 Airlocks shall be free of obstacles, shall provide easy passage and shall not be used for other purposes.

2.3.3.6 An optical and acoustic alarm shall be given on both sides of the airlock, if more than one door is not closed or if gas is detected in the airlock.

2.3.3.7 On the outer sides of doors of airlocks, a clearly visible notice shall be put up bearing the following text in red lettering on a white background:

"Luftschleuse

Hindernisfrei und Türen geschlossen halten!

Ein Alarm wird ausgelöst, falls beide Türen geöffnet sind oder Gas in der Luftschleuse auftritt. "

"Sas

Gardez l'espace libre d'obstacles et les portes fermées !

Une alarme est déclenchée si les deux portes sont ouvertes ou du gaz est détecté dans le sas."

"Luchtsluis

Houd de doorgang vrij en de deuren gesloten!

Wanneer een alarm wordt gegeven, zijn beide deuren open of is er gas in de luchtsluis gas gedetecteerd."

"Airlock

Keep free of obstacles and doors closed!

An alarm is given if both doors are open or gas is detected in the airlock."

2.3.4 Ventilation systems

2.3.4.1 Any ducting used for the ventilation of hazardous areas shall be separate from that used for the ventilation of non-hazardous areas.

2.3.4.2 The ventilators used for ventilation of hazardous areas shall be of a certified safe type.

2.3.4.3 Electric engines driving ventilators shall comply with the required explosion protection in the area where they are installed.

2.3.4.4 An optical and acoustic alarm shall be triggered in the wheelhouse or at any other permanently manned location in the event of any loss of the required ventilating capacity.

2.3.4.5 Ventilation systems required to avoid any explosive atmosphere shall have at least two ventilators with independent power supply, each of sufficient capacity.

2.3.4.6 Air for ventilation of hazardous areas shall be taken from non-hazardous areas.

2.3.4.7 Air for ventilation of non-hazardous areas shall be taken from non-hazardous areas which are located at least 1,50 m from the boundaries of any hazardous area.

2.3.4.8 Where an inlet duct passes through a space with hazardous areas, the duct shall have overpressure relative to this space. Overpressure shall not be required if it is ensured that gases cannot leak into the duct.

Where an outlet duct from a hazardous area passes through a space with only non-hazardous areas, the duct shall have underpressure relative to this space. Underpressure shall not be required when structural measures on the duct ensure that gases cannot leak into the space.

2.3.4.9 Air outlets from hazardous areas shall be located in an open area which has the same or less hazard than the ventilated areas.

2.3.4.10 Air outlets from non-hazardous areas shall be located outside any hazardous area.

2.3.4.11 In enclosed rooms the air exhaust outlets shall be located at the top of these rooms. Air inlets shall be located at the bottom.

2.3.5 GH_2 tank swapping systems

2.3.5.1 If GH_2 systems rely on swappable tanks, the risk assessment according to Article 30.04 shall include the risks arising from

a) swapping operations,

b) connection/disconnection of fuel lines,

c) connection/disconnection of cables related to control, monitoring and safety systems on the swappable tanks,

d) connection/disconnection of earthing cables, and

e) fixation of the swappable tanks on the vessel.

Swappable tanks are considered as a part of the vessel and thus subject to the risk assessment according to Article 30.04.

2.3.5.2 Swappable tanks shall be arranged in such a way that the quantity of hydrogen discharged while connecting or disconnecting these tanks is minimised.

2.3.5.3 All valves used for connection or disconnection of swappable tanks shall be located on the open deck to ensure sufficient natural ventilation in accordance with International Standards IEC 60079-10-1 : 2020 and IEC 60079-10-2 : 2015.

2.3.5.4 If hoses are used for connection of swappable tanks, they shall be routed with an air hose by analogy with (2.3.6.10). The inspection body may accept equivalent arrangements to detect fire or rupture of the hose used for the connection of swappable tanks.

2.3.5.5 Swappable tanks shall be fitted with a corrosion resistant metal plate permanently attached in a conspicuous place readily available for inspection. As a minimum the following information shall be marked on the plate by stamping or any other similar method:

a) Year of manufacture,

b) Manufacturer’s name or mark,

c) Manufacturer’s serial number,

d) Name of the operator of the swappable tank.

2.3.5.6 In addition to (2.3.5.5), contact details of the operator of swappable tanks and the manufacturer’s serial number shall be prominently displayed on swappable tanks in such a way, that this information is visible once the swappable tanks are installed on a vessel.

2.3.5.7 The inspection body which issued the inland navigation vessel certificate for the vessel, on which a swappable tank will be used, shall certify that the swappable tank is suitable and permitted for use on the vessel by entering the manufacturer's name or mark and serial number in item 52 of the inland navigation vessel certificate.

2.3.5.8 The manufacturer's name or mark and serial number of suitable swappable tanks according to (2.3.5.7) shall be displayed in a prominent position on the vessel at the possible locations of swappable tanks.

2.3.5.9 The inspection body shall issue the inland navigation swappable GH_2 tank certificate, attesting compliance of the swappable tank with the requirements of ES-TRIN.

2.3.5.10 A copy of the inland navigation swappable GH_2 tank certificate shall be onboard of the vessel on which a swappable tank is used.

2.3.5.11 By way of derogation from (2.3.5.9) and (2.3.5.10), the information, which the inland navigation swappable GH_2 tank certificate provides for, may be entered in item 52 of the inland navigation vessel certificate for the vessel, on which a swappable tank will be used. This will be done by the inspection body which issued the inland navigation vessel certificate for the vessel.

2.3.6 GH_2 bunkering systems for permanently installed tanks

2.3.6.1 GH_2 bunkering systems shall be arranged in such a way that

a) no hydrogen is discharged into the atmosphere during filling of GH_2 tanks; and

b) the quantity of hydrogen discharged while connecting, disconnecting or purging of hoses is minimised.

2.3.6.2 Bunkering stations and all valves used for bunkering shall be located on the open deck to ensure sufficient natural ventilation in accordance with International Standards IEC 60079-10-1 : 2020 and IEC 60079-10-2 : 2015.

2.3.6.3 Bunkering stations shall be so positioned and arranged in such a way that any damage to the bunkering piping does not cause damage to the vessel's GH_2 containment system.

2.3.6.4 Suitable means shall be provided to relieve the pressure from bunkering piping.

2.3.6.5 Hoses used for the bunkering of GH_2 shall be designed for a bursting pressure in accordance with the European Standard EN ISO 16964 : 2020.

2.3.6.6 Bunkering manifolds 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.

The bunkering manifold shall be suitably labelled in colour. This requirement is deemed to be fulfilled if the requirements of the international standard ISO 14726 : 2008 are met.

2.3.6.7 It shall be possible to operate master GH_2 bunkering valves during bunkering operations from control stations according to (2.3.10.5).

2.3.6.8 Bunkering piping shall be arranged for inerting and gas freeing.

2.3.6.9 Components of bunkering systems shall be in accordance with an International Standard or equivalent regulations of one of the Member States.

2.3.6.10 A hose filled with air (“air hose”) shall be routed over the hose used for the bunkering of GH_2. In case of fire or rupture of the hose used for the bunkering of GH_2, this air hose shall melt or break which, due to the loss of air pressure in the air hose, triggers an automatic shutdown of the bunkering on both sides. The inspection body may accept equivalent arrangements to detect fire or rupture of the hose used for the bunkering of GH_2.

2.3.7 Gas supply systems

2.3.7.1 Gas supply systems shall be so arranged that the consequences of any release of gas will be minimised, while providing safe access for operation and inspection.

2.3.7.2 Parts of gas supply systems which are located outside the engine room or the fuel cell space shall be designed in a way that a failure of one barrier cannot lead to a leak from the system into the surrounding area causing immediate danger to the people on board, the environment or the vessel.

2.3.7.3 GH_2 tank inlets and outlets shall be provided with valves located as close to the tank as possible.

2.3.7.4 Gas supply systems to individual engines or several engines shall be equipped with a master fuel valve. The valves shall be situated as close as practicable to the gas preparation system but, in any case, outside the engine room.

Gas supply systems to individual fuel cell spaces or several fuel cell spaces shall be equipped with a master fuel valve to shut-off fuel supply lines to consumer equipment. The valves shall be situated as close as practicable to the gas preparation system but, in any case, outside the fuel cell space.

The master fuel valve shall be marked in red. If the valve is concealed it shall be marked with a symbol for the “quick-closing valve on the tank” in accordance with Figure 9 of Annex 4 with a side length of at least 10 cm.

2.3.7.5 In the case of a propulsion or auxiliary system with an internal combustion engine, the master fuel valve shall be operable:

a) within and outside the engine room, and

b) from the wheelhouse.

2.3.7.6 In the case of a propulsion or auxiliary system with fuel cells, by analogy with Article 8.05(7), the master fuel valve shall be operable:

a) from the outside in the direct vicinity of the fuel cell space,

b) from the inside in case of fuel cell space referred to in (3.1.1.14.5), and

c) from the wheelhouse.

2.3.7.7 Any gas consumer equipment shall be provided with a set of double block and bleed valves to assure safe isolation of the fuel supply system. The two block valves shall be of the fail-to-close type, while the ventilation valve shall be of the fail-to-open type.

2.3.7.8 For multi-engine installations, where a separate master fuel valve is provided for each engine and for one-engine installations, the master fuel valve and the double block and bleed valve functions can be combined~~.~~

For installations with several fuel spaces, where a separate master fuel valve is provided for each fuel space and for a single fuel cell, the master fuel valve and the double block and bleed valve functions can be combined.

One shutdown valve of the double block and bleed valves shall also be manually operated.

2.3.8 Gas supply shut down

2.3.8.1 In case of shut-off of the GH_2 supply system in a dual fuel engine, the engine shall be capable of continuous operation on gasoil only without interruption. If the GH_2 supply is not changed over to the gasoil before shutting off the dual fuel engine, the GH_2 supply system from the master fuel valve to the engine and the exhaust system shall be purged in order to discharge any residual gas which may be present.

2.3.8.2 In case of an emergency stop or normal stop, the GH_2 supply shall be automatically shut off not later than

a) the supply of the gasoil for dual fuel engines. It shall not be possible to shut off the gasoil without first or simultaneously closing the GH_2 supply to the respective cylinders or to the complete engine.

b) the ignition source for single fuel engines. It shall not be possible to shut off the ignition source without first or simultaneously closing the GH_2 supply to the respective cylinders or to the complete engine.

2.3.8.3 In the case of a propulsion or auxiliary system with fuel cells, it shall not be possible to shut off the fuel cell system without first or simultaneously closing the GH_2 supply.

2.3.9 Fire Safety

2.3.9.1 In addition to Article 30.08, the provisions of (2.3.9) apply.

2.3.9.2 Fuel cell spaces and rooms for the hydrogen gas conversion and preparation equipment shall be regarded as engine rooms for fire protection and escape purposes.

2.3.9.3 Fire alarm systems

2.3.9.3.1 Suitable UV and IR flame detectors shall be provided for

a) all rooms and spaces of the GH_2 system and

b) open decks

where hydrogen fires cannot be excluded.

These detectors shall have an unobstructed view on the potential fire locations for the early detection of hydrogen fires.

2.3.9.3.2 The fire alarm system shall have the means to identify each fire detector or manual call point individually.

2.3.9.3.3 The gas safety system shall shut down the relevant parts of the gas supply system automatically upon fire detection in spaces containing GH_2 system components.

2.3.9.4 Fire protection

2.3.9.4.1 Accommodation, passenger areas, engine rooms, work stations and escape routes shall be shielded with Type A60 partitions

The inspection body may waive the requirement for Type A60 partitions or accept alternative solutions, based on the risk assessment according to Article 30.04 and the heat load calculation. For the evaluation of the most critical events, the heat load calculation shall demonstrate that the pain threshold of 2,5 kW/m² for 5 minutes is not exceeded. The risk assessment shall provide validated evidence for risks and mitigation measures. It shall also follow a risk mitigation approach in sequence of priority and use: passive protection/mitigation, active protection/mitigation. Alarm mitigation and procedural mitigation are not acceptable measures in this case.

2.3.9.4.2 The boundaries of GH_2 tank rooms, tank holds of swappable tanks and ventilation ducts to rooms listed in (2.3.9.4.1) shall comply with Type A60. However, where the GH_2 tank rooms, tank holds of swappable tanks and ventilation ducts are adjacent to

a) tanks of no fire risk,

b) voids,

c) auxiliary engine rooms of little or no fire risk,

d) cargo tanks containing non-hazardous cargo,

e) sanitary and similar spaces,

the insulation may comply with Type A0.

2.3.9.5 Fire prevention and cooling

2.3.9.5.1 A water spray system shall be installed to protect exposed parts of GH_2 tank(s) located on open deck from fire in the surroundings.

The inspection body may waive the requirement for the installation of a water spray system or accept alternative solutions, based on the risk assessment according to Article 30.04.

2.3.9.5.2 If the water spray system is part of the firefighting systems mentioned in Articles 13.04 or 13.05, the required fire pump capacity and working pressure shall be sufficient to ensure the operation of both the required numbers of hydrants and hoses and the water spray system simultaneously. The connection between the water spray system and the firefighting systems according to Articles 13.04 or 13.05 shall be provided through a screw-down non-return valve.

2.3.9.5.3 If firefighting systems according to Articles 13.04 or 13.05 are installed onboard vessels where GH_2 tanks are located on open deck, isolating valves shall be fitted in the firefighting systems in order to isolate damaged sections of the firefighting systems. Isolation of a section of firefighting systems shall not deprive the fire line ahead of the isolated section of water.

2.3.9.5.4 The water spray system shall also provide coverage for boundaries of the superstructures, unless the tank is located 3,00 m or more from the boundaries.

2.3.9.5.5 The water spray system shall be designed to cover all areas as specified above with an application rate of 10 l/min/m^2 for horizontal projected surfaces and 4 l/min/m^2 for vertical surfaces.

2.3.9.5.6 The water spray system shall be capable of being put into operation from the wheelhouse and from the deck.

2.3.9.5.7 The nozzles shall be arranged to ensure an effective distribution of water throughout the area being protected.

2.3.9.5.8 The water spray system shall not inhibit the proper functioning of GH_2 safety valves.

2.3.9.6 Fire extinguishing

2.3.9.6.1 In addition to the requirements of Article 13.03, two portable dry powder fire extinguishers with a total nominal charge of at least 12 kg shall be located near the bunkering stations and the connections of swappable tanks. They shall be suitable for Class A, B and C fires.

2.3.10 Control, monitoring and safety systems

2.3.10.1 In addition to Article 30.10, the provisions of (2.3.10) apply.

2.3.10.2 Without prejudice to Article 30.07, upon failure in systems essential for the safety and upon fault conditions which may develop too fast for manual intervention, the GH_2 safety system shall shut down the fuel supply system automatically.

2.3.10.3 The GH_2 supply system shall be fitted with its own gas control and gas monitoring system and its own gas safety system. All elements of these systems shall be capable of being functionally tested.

2.3.10.4 Each GH_2 tank shall be fitted with a pressure indicator capable of:

a) indicating throughout the operating pressure range and which is clearly marked with the maximum working pressure of the GH_2 tank; and

b) actuating the master GH_2 bunkering valve in a manner that will both avoid excessive pressure in the bunkering piping and the tank.

2.3.10.5 Control of the bunkering shall be possible from a safe control station remote from the bunkering station. It shall be possible to monitor the GH_2 tank pressure at this control station. Overfill alarm, high and low-pressure alarm and automatic shutdown of the bunkering shall be indicated at this control station.

2.3.10.6 If the ventilation in the ducting enclosing the bunkering lines stops, an optical and acoustic alarm shall be actuated at the control station.

2.3.10.7 If gas is detected in the ducting enclosing the bunkering lines, an optical and acoustic alarm and emergency shutdown of the bunkering shall be actuated at the control station.

2.3.10.8 Appropriate and sufficient suitable protective clothing and equipment for bunkering operations shall be available on board according to the operating manual according to Article 30.05(5).

2.3.11 Gas warning equipment

2.3.11.1 Gas warning equipment shall be designed, installed and tested in accordance with a Standard recognized by one of the Member States, such as International Standards IEC 60079-29-1 : 2022 and IEC 60079-29-2 : 2015.

2.3.11.2 Permanently installed gas detectors shall be provided for:

a) tank connection areas in enclosed spaces including fuel tanks, pipe connections and first valves,

b) ducts around gas piping,

c) rooms containing a gas preparation system,

d) other enclosed rooms containing gas piping or other gas equipment without ducting,

e) other enclosed or semi-enclosed rooms

aa) where gas may accumulate including interbarrier spaces and

bb) tank rooms of independent GH_2 tanks other than type C,

f) airlocks, and

g) air outlets of rooms in which gas may accumulate.

2.3.11.3 By derogation to (2.3.11.2), permanently installed sensors which detect gas by difference of pressure can be used for interbarrier spaces in double wall piping.

2.3.11.4 The number and redundancy of gas detectors in each room shall be considered taking size, layout and ventilation of the room into account.

2.3.11.5 An optical and acoustic alarm shall be activated before the gas concentration reaches 20 % of the LEL. The gas safety system shall be activated at 40 % of the LEL.

2.3.11.6 Optical and acoustic alarms from the gas warning equipment shall be actuated in the wheelhouse.

2.3.12 Safety functions of GH_2 supply systems

2.3.12.1 If the GH_2 supply system is shut off due to activation of an automatic valve, it shall not be restarted until the reason for the disconnection is ascertained and the necessary actions are taken. Instructions to this effect shall be placed in a prominent position in the wheelhouse and at any location from where the shut-off valves in the GH_2 supply lines can be operated.

2.3.12.2 If the GH_2 supply system is shut off due to a leak in the GH_2 supply system, it shall not be opened until the leak has been found and the necessary actions have been taken.

2.3.12.3 The GH_2 supply system shall be arranged for manual remote emergency stop from the wheelhouse, or a permanently manned location, as applicable.

2.3.13 Risk assessment

In addition to Article 30.04(1), if vessels using GH_2 are intended to

a) pass locks together with, or

b) be moored side by side with

vessels having onboard persons other than crew, or pleasure craft, the risks for persons on board of these vessels or of pleasure craft have to be considered as well.

Appendix
Model of inland navigation swappable GH_2 tank certificate

INLAND NAVIGATION SWAPPABLE GH_2 TANK CERTIFICATE

No .....

Place, date

.....

Inspection body

.....
Stamp

.....
(Signature)

Remarks:

The swappable tank may be used on an inland navigation vessel by virtue of the tank certificate only while in the condition as presented to the initial inspection.

After any modification or repair, the swappable tank must undergo a special inspection before being used anew on an inland navigation vessel.

The owner of the swappable tank, or his representative, shall bring to the notice of the inspection body

- any change in the ownership or of the operator of the tank, and
- the decommissioning of the swappable tank,

and shall send the inland navigation swappable GH_2 tank certificate to that inspection body for amendment or withdrawal.

Inland navigation swappable GH_2 tank certificate No ..... of the inspection body .....

1. Manufacturer's serial number	
2. Name and address of owner of the swappable tank	
3. Name and address of operator of the swappable tank	
4. Year of manufacture	5. Manufacturer's name or mark and location of manufacturer
6. (left void)	

7. The abovementioned swappable tank,

subsequent to the inspection carried out on *) .....

on presentation of the certificate issued on *) .....

by the recognised classification society / technical service .....

fulfils the relevant requirements of ES-TRIN.

8. The validity of this inland navigation swappable GH_2 tank certificate expires on ..

Place, date ..... Inspection body

.....

Stamp

.....

(Signature)

*) Delete as appropriate

Inland navigation swappable GH_2 tank certificate No ..... of the inspection body .....

9. **Extension/confirmation *) of inland navigation swappable GH_2 tank certificate validity*) periodical - special*) inspection**

The inspection body inspected the swappable tank on..... *).
A certificate dated ..... from the recognised classification society / technical service .....
was presented to the inspection body*).
Reason for the inspection/certificate*):
.....
.....
In view of – the inspection result - certificate - *), the period of validity of the inland navigation swappable GH_2 tank certificate is maintained – extended -*)
until ..... .

....., ...
(Place) (date)

.....
Stamp Inspection body
.....
(Signature)

*) Delete as appropriate

9. **Extension/confirmation *) of inland navigation swappable GH_2 tank certificate validity*) periodical - special*) inspection**

The inspection body inspected the swappable tank on..... *).
A certificate dated ..... from the recognised classification society / technical service .....
was presented to the inspection body*).
Reason for the inspection/certificate*):
.....
.....
In view of – the inspection result - certificate - *), the period of validity of the inland navigation swappable GH_2 tank certificate is maintained – extended -*)
until ..... .

....., ...
(Place) (date)

.....
Stamp Inspection body
.....
(Signature)

*) Delete as appropriate

Inland navigation GH_2 swappable tank certificate No ..... of the inspection body .....

10. Annex to inland navigation swappable GH_2 tank certificate No .....

*) Amendment to item(s): .....

New text: .....

*) This page has been replaced.

Place, date ..... Inspection body

.....

Stamp

.....

(Signature)

*) Delete as appropriate

Continued on page*) .....

End of the certificate*)

Chapter 4
Liquefied Hydrogen (LH_2)

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Chapter 5
Other Hydrogen carriers

(left void)

Section III
Energy converters

Chapter 1
Propulsion and auxiliary systems with fuel cells

3.1.1 Fuel cell spaces

3.1.1.1 The requirements of this Chapter shall apply to fuel cell spaces located either on deck or below deck.

3.1.1.2 Only components necessary for the operation of the fuel cell systems shall be permitted in fuel cell spaces.

3.1.1.3 Fuel cell components shall be surrounded by a secondary barrier. The boundary of a fuel cell space may act as a secondary barrier.

3.1.1.4 Fuel cell spaces shall be designed in such a way that their geometrical shape ensures good air circulation or good distribution of inert gas, as to minimise the possibility of entrapping explosive mixture.

3.1.1.5 A permanently installed, continuously measuring gas detection system shall be in place in fuel cell spaces.

3.1.1.6 Fuel cell spaces containing fuel reformers shall also comply with the requirements for the relevant fuel storage in accordance with Annex 8, Section II.

3.1.1.7 Appropriate fire partition requirements of fuel cell spaces shall be established by the risk assessment in accordance with Article 30.04, with special consideration given to the installation location and fire load of the fuel cell space.

3.1.1.8 Fuel cell spaces shall not be located less than:

a) 1,00 m or B/5 from the vessel’s side whichever is less, and

b) 0,60 m from the vessel’s bottom.

The inspection body may allow shorter distances in the absence of hazardous areas, based on the risk assessment, according to Article 30.04.

3.1.1.9 One of the following concepts shall be applied to fuel cell spaces:

a) inerted fuel cell space,

b) explosion-protected fuel cell space, or

c) ventilated fuel cell space.

3.1.1.10 Requirements for inerted fuel cell spaces

3.1.1.10.1 Inerted fuel cell spaces are fuel cell spaces protected by inert gas. They shall be considered as non-hazardous areas.

3.1.1.10.2 The boundary of the fuel cell space that acts as secondary barrier shall be gastight. The design pressure of the boundary shall be suitable for the intended application.

3.1.1.10.3 During normal operation of the fuel cell system, the fuel cell space shall be inerted.

3.1.1.10.4 In the event of leakage of gas being detected or loss of inertion:

a) the fuel supply to the fuel cell space concerned, and

b) the fuel cell components in the fuel cell space concerned

shall be shut down automatically.

3.1.1.10.5 Gas tightness and integrity of the secondary barrier shall be permanently monitored by appropriate measures. In the event of leakage of inerted gas being detected in adjacent rooms where persons are present during normal operation, an optical and acoustic alarm shall be triggered

a) in the affected rooms and

b) in the wheelhouse or at any other permanently manned location.

In the event of failure of the gas tightness and integrity of the secondary barrier, the fuel supply to the fuel cell system shall be shut down automatically.

3.1.1.11 Requirements for explosion-protected fuel cell spaces

3.1.1.11.1 Explosion-protected fuel cell spaces shall be considered as hazardous areas (Zone 1).

3.1.1.11.2 In accordance with Article 10.04, only explosion-protected equipment (certified safety) is permitted. This shall be deemed to be fulfilled if the equipment meets the relevant provisions of the European Standard series EN 60079.

3.1.1.11.3 By way of derogation from (3.1.1.3), the function of the secondary barrier shall be achieved by mechanical ventilation ensuring permanent negative pressure relative to adjacent rooms.

3.1.1.11.4 The ventilation system shall:

a) guarantee a sufficient capacity of ventilation to ensure that the gross volume of air inside the fuel cell space is changed at least 30 times per hour, and

b) be independent of all other ventilation systems of the vessel.

3.1.1.11.5 In the event of leakage of gas leading to a concentration above 20 % of the LEL, an optical and acoustic alarm shall be triggered in the wheelhouse or at any other permanently manned location.

3.1.1.11.6 In the event of leakage of gas leading to a concentration above 40 % of the LEL or the ventilation system fails,

a) the fuel supply to the fuel cell space concerned, and

b) the fuel cell components in the fuel cell space concerned

shall be shut down automatically.

3.1.1.12 Requirements for ventilated fuel cell spaces

3.1.1.12.1 The possible hazardous areas within the ventilated fuel cell spaces shall be classified in accordance with Article 10.04.

3.1.1.12.2 In accordance with Article 10.04, only equipment suitable for the hazardous areas as classified in (3.1.1.12.1) is permitted. This shall be deemed to be fulfilled if the equipment meets the relevant provisions of the European Standard series EN 60079.

3.1.1.12.3 By way of derogation from (3.1.1.3), the function of the secondary barrier shall be achieved by mechanical ventilation ensuring permanent negative pressure relative to adjacent rooms.

3.1.1.12.4 The ventilation system shall:

a) guarantee a sufficient capacity of ventilation to ensure that the gross volume of air inside the fuel cell space is changed at least at the rate which has been assumed for the hazardous area calculation referred to in (3.1.1.12.1). This shall be deemed to be fulfilled if the dilution is determined in accordance with Article 10.04(1), and

b) be independent of all other ventilation systems of the vessel.

3.1.1.12.5 In the event of leakage of gas leading to a concentration above 20 % of the LEL, an optical and acoustic alarm shall be triggered in the wheelhouse or at any other permanently manned location.

3.1.1.12.6 In the event of leakage of gas leading to a concentration above 40 % of the LEL or the ventilation system fails:

a) the fuel supply to the fuel cell space concerned and

b) the fuel cell components in the fuel cell space concerned

shall be shut down automatically.

3.1.1.13 Specific requirements or derogations for fuel cell spaces on deck

3.1.1.13.1 For fuel cell spaces on deck, the inspection body may allow derogation from (3.1.1.3) and (3.1.1.12.3) provided that:

a) the fuel cell space is located on open deck with no directly adjacent rooms on the same deck;

b) the fuel cell space is naturally ventilated to ensure that the gross volume of air inside the fuel cell space is changed in accordance with (3.1.1.12.4);

c) the risk assessment according to Article 30.04 does not identify any contraindication.

3.1.1.14 Access to fuel cell spaces

3.1.1.14.1 Access to fuel cell spaces shall not be possible before the fuel cell components inside are safely shut down, isolated from the fuel supply system, drained of leakages and the inside atmosphere is confirmed gas-free.

It shall be possible to remotely operate and monitor from outside the fuel cell space all controls and all parameters required for safe operation of the fuel cell system and gas freeing of the fuel cell space.

3.1.1.14.2 The fuel cell space openings shall be equipped with an interlock preventing operation of the fuel cell system when the fuel cell space is open.

3.1.1.14.3 Doors to fuel cell spaces shall bear on the outside the symbol corresponding to Figure 1 in Annex 4 (“No entry for unauthorised persons”) as well as the fuel specific symbol in accordance with Article 30.06.

3.1.1.14.4 For the purpose of entering the inerted fuel cell spaces, it shall be possible that the inerted atmosphere in the fuel cell space is replaced by air that is safe to breathe. It shall be indicated outside the fuel cell space whether the air is safe to breathe.

3.1.1.14.5 The inspection body may allow derogation to (3.1.1.14.1), provided that:

a) the opening of the fuel cell space leads directly to open deck,

b) the opening of the fuel cell space is through an air lock, or

c) the fuel cell space is considered as non-hazardous area in accordance with (3.1.1.12.1).

3.1.1.14.6 For safe maintenance, it shall be possible that the fuel cell components are:

a) isolated from the fuel supply system, and

b) drained and purged of fuel.

3.1.1.14.7 Fuel cell systems and their components shall be installed and fitted in such a way as to be adequately accessible for operation and maintenance and shall not endanger the persons assigned to those tasks.

3.1.2 Fuel Piping systems in the fuel cell spaces

3.1.2.1 The piping used for the supply of primary fuel shall comply with the respective requirements of Annex 8 Section II.

3.1.2.2 Fuel piping shall be protected against hazards arising from electrostatic charges.

3.1.2.3 The maximum working pressure for piping inside fuel cell spaces shall not exceed 1000 kPa (gauge value). The inspection body may allow higher working pressure, based on the risk assessment according to Article 30.04.

3.1.3 Reformer

3.1.3.1 The volume of fuel in the reformer shall be limited to the volume required for a stable continuous operation. Storage of fuel in the reformer shall not be permitted.

3.1.3.2 Reformer with a design pressure of more than 50 kPa shall comply with the requirements of Article 8.01(2).

3.1.3.3 Unintended accumulations of inflammable mixtures in burner systems and oxidation units of the reformer shall be avoided.

3.1.3.4 An automatic burner control system shall be installed to enable the safe start, operation and shutdown of the burner system of the reformer.

3.1.3.5 The complete combustion of the gases in the burner shall be monitored.

3.1.3.6 Surfaces likely to reach high temperatures shall be provided with insulation or protection against contact.

3.1.4 Buffer vessel

3.1.4.1 Fuel buffer vessels in fuel cell systems, if present, may only be used to provide process-related fuel and temporary reserves but not as an additional fuel storage.

3.1.4.2 The buffer vessels shall be arranged near the fuel cells and shall comply with the requirements of (3.1.2).

3.1.5 Fuel cell systems

3.1.5.1 Fuel cell systems shall be constructed and tested in accordance with the applicable standards of the International Standards series IEC 62282 or equivalent standards.

3.1.5.2 Materials used for the fuel cell systems shall be suitable for the intended application. This shall be deemed to be fulfilled when the materials comply with:

a) the International Standard IEC 62282-3-100 : 2019 or

b) an equivalent regulation or Standard recognised by one of the Member States.

3.1.6 Ventilation systems

3.1.6.1 The ventilators used for ventilation of hazardous areas shall be of a certified safe type.

3.1.6.2 Electric engines driving ventilators shall comply with the required explosion protection in the area where they are installed.

3.1.6.3 An optical and acoustic alarm shall be triggered in the wheelhouse or at any other permanently manned location in the event of any loss of the required ventilating capacity.

3.1.6.4 At least two ventilators shall be installed for the ventilation of hazardous areas to guarantee 100 % of the required ventilation capacity if one ventilator fails. The supply from the emergency power source shall also enable the ventilation system to provide 100 % of the required ventilation capacity.

3.1.6.5 Air for ventilation of hazardous areas shall be taken from non-hazardous areas.

3.1.6.6 Air for ventilation of non-hazardous areas shall be taken from non-hazardous areas which are located at least 1,50 m from the boundaries of any hazardous area.

3.1.6.7 Where an inlet duct passes through a space with hazardous areas, the duct shall have overpressure relative to this space. Overpressure shall not be required if it is ensured that gases cannot leak into the duct.

3.1.6.8 Air outlets from hazardous areas shall be located in an open area which has the same or less hazard than the ventilated areas.

3.1.6.9 Air outlets from non-hazardous areas shall be located outside any hazardous area.

3.1.6.10 Air inlets and outlets shall be located in appropriate positions, taking into account the characteristics of the fuel used.

3.1.7 Exhaust systems

3.1.7.1 The following provisions apply to systems for exhaust air and exhaust gas from fuel cell systems.

3.1.7.2 The exhaust systems of the fuel cell systems shall

a) not be connected to the exhaust pipes of systems other than fuel cell systems and

b) shall lead the gases to open air.

However, the exhaust pipes of the fuel cell systems may be combined with the fuel cell space ventilation at the ventilation outlet of the fuel cell space, provided that the exhaust gases of one fuel cell system cannot escape into another fuel cell system.

3.1.7.3 The exhaust systems shall be made of an appropriate material regarding its temperature limit, fire resistance, material strength and resistance to the action of condensate.

3.1.7.4 All suitable measures shall be taken to avoid ingress of exhaust air and exhaust gas into the various compartments of the vessel.

3.1.7.5 Outlets of exhaust systems shall be designed in such a way that they cause no immediate danger to the people on board. They shall be located in appropriate positions, taking into account the characteristics of the exhaust air and exhaust gas.

3.1.7.6 The exhaust systems and their outlets are to be classified in accordance with Article 10.04. Only equipment suitable for the hazardous area as classified is permitted.

3.1.7.7 The exhaust systems shall be designed to keep accumulation of unoxidised fuel as low as possible.

3.1.7.8 Routing and isolation of the exhaust system shall take the accumulation of condensate into account.

3.1.7.9 Exhaust gas systems must allow safe condensate drainage.

3.1.7.10 If the exhaust systems are not provided by the fuel cell manufacturer, they must comply with the fuel cell manufacturer's instructions.

3.1.8 Purging system

3.1.8.1 For fuel cell systems requiring purging for safe operation, especially before the start-up or after the shutdown of the fuel cell system, a suitable purging system that uses a medium specified by the fuel cell manufacturer shall be used.

3.1.9 Control, monitoring and safety systems

3.1.9.1 In addition to Article 30.10, the provisions of (3.1.9) apply.

3.1.9.2 Each fuel cell system shall be fitted with its own control and monitoring system and its own safety system. The safety system shall be designed to operate independently of the control and monitoring system. All elements of these systems shall be capable of being functionally tested.

Software for programmable electronic systems shall be developed in accordance with an acceptable quality management system considering all software lifecycle activities as design, development, supply and maintenance.

3.1.9.3 Sensors for the safety system shall be first routed to safety system and particular information may be also routed towards control and monitoring systems. Alarm sensors shall be directly routed to the monitoring system.

3.1.9.4 It shall be possible to manually shut down the fuel cell system from the following locations:

a) wheelhouse,

b) from the outside in the direct vicinity of the fuel cell space,

c) any permanently manned location.

The safety system shall be manually reset before the propulsion or auxiliary system can be restarted.

3.1.9.5 Suitable devices shall monitor chemical reactions in the reformer and in the fuel cells by means of temperature, pressure and voltage control.

Chapter 2
Propulsion and auxiliary systems with internal combustion engines using LNG as fuel

3.2.1 General

3.2.1.1 Requirements of Annex 8, Section II, (2.1.2) to (2.1.6), (2.1.9), (2.1.10), (2.1.11.1), (2.1.11.2), (2.1.13.1), (2.1.13.3) and (2.1.13.4) also apply to propulsion and auxiliary systems with internal combustion engines using LNG as fuel.

3.2.1.2 One of the following concepts shall be applied to engine rooms:

a) gas safe engine room,

b) explosion safe engine room or

c) ESD protected engine room.

3.2.2 Requirements for gas safe engine rooms

3.2.2.1 Gas safe engine rooms shall be gas safe under all conditions (“inherently gas safe”). A single failure within the LNG system shall not lead to a leakage of gas into the engine room. All gas piping within engine room boundaries shall be enclosed in a gas tight enclosure, e.g. double wall piping or ventilated ducting.

3.2.2.2 In case one barrier fails, the gas supply to the relevant part of the LNG system shall be shut down automatically.

3.2.2.3 In addition to the provision of (2.1.6), the ventilation system of ventilated ducting shall:

a) guarantee a sufficient capacity to ensure that the gross volume of air inside the ventilated ducting can be changed at least 30 times per hour;

b) be equipped to detect gas presence continuously in the space between inner and outer pipes; and

c) be independent of all other ventilation systems of the vessel, in particular the ventilation system of the engine room.

3.2.2.4 Gas safe engine rooms shall be considered as non-hazardous areas, unless the risk assessment according to Article 30.04 demonstrates otherwise.

3.2.3 Requirements for explosion safe engine rooms

3.2.3.1 Arrangements in explosion safe engine rooms shall be such that the rooms are considered gas safe under normal conditions. A single failure within the LNG system shall not lead to a gas concentration over 20 % of the LEL into the engine room.

3.2.3.2 In the event of leakage of gas being detected or the ventilation system failing, the gas supply to the relevant part of the LNG system shall be shut down automatically.

3.2.3.3 In addition to the provision of (2.1.6), the ventilation system shall:

a) guarantee a sufficient capacity to maintain gas concentration below 20 % of the LEL in the engine room, and to ensure that the gross volume of air inside the engine room can be changed at least 30 times per hour; and

b) be independent of all other ventilation systems of the vessel.

3.2.3.4 Under normal operation the engine room shall be permanently ventilated with at least 15 changes of the gross volume of air inside the engine room per hour.

3.2.3.5 Explosion safe engine rooms shall be designed to provide a geometrical shape that minimises the accumulation of gases and the formation of gas pockets. A good air circulation shall be ensured.

3.2.3.6 Explosion safe engine rooms shall be considered as Zone 2, unless the risk assessment according to Article 30.04 demonstrates otherwise.

3.2.4 Requirements for the ESD protected engine rooms

3.2.4.1 Arrangements in ESD protected engine rooms shall be such that the rooms are considered gas safe under normal conditions, but under certain abnormal conditions may have the potential to become subject to gas hazards.

3.2.4.2 In the event of abnormal conditions involving gas hazards, emergency shutdown (ESD) of non-safe equipment (ignition sources) and gas machinery shall be automatically executed, while equipment or machinery in use or active during these conditions shall be of a certified safe type.

3.2.4.3 In addition to the provision of (2.1.6), the ventilation system shall:

a) guarantee a sufficient capacity to ensure that the gross volume of air inside the engine room can be changed at least 30 times per hour,

b) be designed to handle the probable maximum leakage due to technical failures, and

c) be independent of all other ventilation systems of the vessel.

3.2.4.4 Under normal operation the engine room shall be permanently ventilated with at least 15 changes of the gross volume of air inside the engine room per hour.
If gas is detected in the engine room, the number of air changes shall automatically be increased to 30 changes per hour.

3.2.4.5 If the vessel is equipped with more than one propulsion engine, these engines shall be located in at least two separate engine rooms. These engine rooms shall have no common partitions. However, common partitions may be accepted, if it can be documented that any consequences of a single failure will not affect both rooms.

3.2.4.6 Fixed gas warning equipment arranged to automatically shut down the gas supply to the engine room concerned and to disconnect all non-explosion protected equipment or installations shall be fitted.

3.2.4.7 ESD protected engine rooms shall be designed to provide a geometrical shape that minimises the accumulation of gases and the formation of gas pockets. A good air circulation shall be ensured.

3.2.4.8 ESD protected engine rooms shall be considered as Zone 1, unless the risk assessment according to Article 30.04 demonstrates otherwise.

3.2.5 Exhaust system

3.2.5.1 Exhaust systems shall be designed to keep accumulation of unburnt fuel as low as possible.

3.2.5.2 Unless designed with the strength to withstand the worst case of overpressure due to ignited gas leaks, engine components or systems that can contain an ignitable gas and air mixture, shall be fitted with suitable pressure relief valves.

3.2.5.3 Means shall be provided to monitor and detect incorrect operation of the ignition system, poor combustion or misfiring that may lead to unburnt fuel in the exhaust system.

3.2.5.4 The exhaust pipes of gas or dual fuel engines shall not be connected to the exhaust pipes of other engines or systems.

3.2.6 Engines

3.2.6.1 Indicators shall be fitted in the wheelhouse and the engine room for:

a) operation of the engine in case of a gas-only engine, or

b) operation and mode of operation of the engine in the case of a dual fuel engine.

3.2.6.2 If incorrect operation of the ignition system, poor combustion or misfiring is detected, the gas supply system shall be shut down automatically.

3.2.6.3 In case of shut-off of the gas supply system in a dual fuel engine, the engine shall be capable of continuous operation on gasoil only without interruption. If the fuel supply is not changed over to gasoil before shutting off the dual fuel engine, the gas supply system from the master fuel valve to the engine and the exhaust system shall be purged in order to discharge any residual gas which may be present.

Chapter 3
Propulsion and auxiliary systems with internal combustion engines using methanol as fuel

3.3.1 General

3.3.1.1 Equipment and piping containing liquid methanol fuel shall be arranged in enclosures, spaces or ducts providing a secondary barrier. This requirement applies notably to pump filters and fittings.

3.3.1.2 The requirements of Annex 8, Section II, (2.2.6), (2.2.7), (2.2.8), (2.2.9), (2.2.11), (2.2.12) and (2.2.13) apply also to propulsion and auxiliary systems with internal combustion engines using methanol as fuel.

3.3.1.3 One of the following concepts shall be applied to engine rooms:

a) gas safe engine room, or

b) ventilated engine room.

Spaces other than engine rooms where machinery is installed which uses methanol as fuel, such as pump rooms or boiler rooms, shall be subjected to the same requirement as engine rooms.

3.3.2 Requirements for gas safe engine rooms

3.3.2.1 Gas safe engine rooms shall be gas safe under all conditions (“inherently safe concept”). A single failure within the methanol system shall not lead to a leakage of methanol into the engine room.

3.3.2.2 Methanol piping and equipment within the engine room boundaries shall be surrounded by a secondary barrier for leakage containment and detection in accordance with the requirements in (a) or (b).

a) Methanol piping shall be double wall piping with the methanol contained in the inner pipe. The design pressure of the secondary barrier around the inner pipe shall not be less than the maximum working pressure of the inner pipe. As an alternative the secondary barrier around the inner pipe shall be dimensioned in accordance with the calculated maximum built-up pressure in case of pipe rupture. Suitable alarms shall be provided to detect and indicate leakage from the inner pipe. An optical and acoustic alarm shall be triggered in the wheelhouse or at any other permanently manned location in the event of the inner barrier failing or detection of leakage.

b) Methanol piping and equipment shall be installed within ventilated ducts or enclosures. The interbarrier space between the methanol piping (or equipment) and the wall of the duct or enclosure shall be equipped with mechanical extraction ventilation having a capacity of at least 6 air changes per hour. The ventilation system shall comply with the requirements of (2.2.9).

Methanol leakage inside the ventilated ducts or enclosures shall be detected by means of suitable detectors in accordance with (2.2.13.3). Methanol leakage must be safely collected and drained by means of leakage collecting arrangements. An optical and acoustic alarm shall be triggered in the engine room and in the wheelhouse or at any other permanently manned location in the event of

aa) the detection of leakage in the interbarrier space,

or

bb) the ventilation system failing.

3.3.2.3 Gas safe engine rooms shall be considered as non-hazardous areas, unless the risk assessment according to Article 30.04 demonstrates otherwise.

3.3.3 Requirements for ventilated engine rooms

3.3.3.1 The possible hazardous areas within the ventilated engine rooms shall be classified in accordance with Article 10.04.

3.3.3.2 In accordance with Article 10.04, only equipment suitable for the hazardous areas as classified according to (3.3.3.1) is permitted. This shall be deemed to be fulfilled if the equipment meets the relevant provisions of the European Standard series EN 60079.

3.3.3.3 By way of derogation from (3.3.1.1), the function of the secondary barrier shall be achieved by mechanical ventilation ensuring permanent negative pressure relative to adjacent rooms.

3.3.3.4 In addition to the provision of (2.2.9), the ventilation system shall:

a) guarantee a sufficient capacity to ensure that the gross volume of air inside the engine room can be changed at least 6 times per hour,

b) be designed to handle and purge the probable maximum leakage due to technical failures, as assumed for the hazardous areas calculation referred to in (3.3.3.1), and

c) be independent of all other ventilation systems of the vessel.

3.3.3.5 In the event of leakage leading to a methanol vapour concentration above 250 ppm in the engine room, an optical and acoustic alarm shall be triggered in

a) the engine room, and

b) the wheelhouse or at any other permanently manned location.

3.3.3.6 In the event of leakage leading to a methanol vapour concentration above 40 % of the LEL in the engine room or the ventilation system failing:

a) the methanol supply to the engine room concerned shall be shut down automatically then

b) the methanol components in the engine room concerned shall be shut down automatically.

3.3.3.7 If the vessel is equipped with more than one propulsion engine, these engines shall be located in at least two separate engine rooms. These engine rooms shall have no common partitions. However, common partitions may be accepted, if it can be documented that any consequences of a single failure will not affect both rooms. In accordance with the risk assessment referred to in Article 30.04, the inspection body may allow propulsions engines in the same ventilated engine room, provided that hazardous areas in the ventilated engine room are being determined to be of negligible extent.

3.3.3.8 Ventilated engine rooms shall be designed to provide a geometrical shape that minimises gas release from leakage pools as well as the accumulation of gases and the formation of gas pockets. Good air circulation shall be ensured. Air inlets and outlets shall be located in appropriate positions, taking into account the characteristics of methanol.

3.3.3.9 Suitable alarms shall be provided to detect and indicate a leakage in the engine room, by means of liquid detectors and high sensitivity gas detectors at suitable places, in accordance with (2.2.13.3).

3.3.3.10 Drip trays with self-draining lines to closed collecting tanks shall be provided under all equipment which contain methanol and from where leakage cannot be excluded.

3.3.3.11 Spray guards shall be provided on pipes and joints where fuel spray cannot be excluded.

3.3.3.12 At least two portable methanol detectors shall be available. The safety rota referred to in Article 30.05(1) shall include instructions for the use and calibration of the portable detectors. Doors of ventilated engine rooms shall bear on the outside the following readily legible instruction: ‘Access to engine room only with portable methanol detector’.

3.3.4 Engines

3.3.4.1 In accordance with (3.3.1.1), engine components containing liquid methanol shall be effectively sealed to prevent leakage of fuel into the engine room.

3.3.4.2 For engines where the space below the piston is in direct communication with the crankcase, a detailed evaluation regarding the hazard potential of fuel gas accumulation in the crankcase shall be carried out and reflected in the safety concept of the engine.

3.3.4.3 Means shall be provided to monitor and detect incorrect operation of the ignition system, poor combustion and misfiring that may lead to unburnt fuel in the exhaust system or in the crankcase.

3.3.4.4 If incorrect operation of the ignition system, poor combustion or misfiring is detected, the control and monitoring system shall trigger an optical and acoustic alarm signal in the wheelhouse. A continued operation may only be allowed to ensure the vessel of making steerageway under its own power and provided that

a) the fuel supply to concerned cylinders can be shut off,

b) the engine manufacturer has declared the engine to be able to operate safely with one or more cylinders cut-off with respect to torsional vibrations, and

c) the instructions for the boatmaster according to letter a) are displayed in the wheelhouse close to the controls of the engine.

3.3.4.5 In case of an emergency stop or a normal stop, the supply of methanol shall be automatically shut off not later than

a) the supply of the other fuel for dual fuel engines. It shall not be possible to shut off the other fuel without first or simultaneously closing the methanol supply to the respective cylinders or to the complete engine.

b) the ignition source for single fuel engines. It shall not be possible to shut off the ignition source without first or simultaneously closing the methanol supply to the respective cylinders or to the complete engine.

3.3.5 Exhaust system

3.3.5.1 Exhaust systems shall be designed to keep accumulation of unburnt fuel as low as possible.

3.3.5.2 Exhaust pipes of methanol engines shall not be connected to exhaust pipes of other engines or systems.

Chapter 4
Propulsion and auxiliary systems with internal combustion engines using hydrogen as fuel

3.4.1 General

3.4.1.1 Requirements of Annex 8, Section II, (2.3.2), (2.3.3), (2.3.4), (2.3.7), (2.3.8), (2.3.9.1) to (2.3.9.4.2), (2.3.10), (2.3.11) and (2.3.12) also apply to propulsion and auxiliary systems with internal combustion engines using hydrogen as fuel.

3.4.1.2 One of the following concepts shall be applied to engine rooms:

a) gas safe engine room,

b) explosion safe engine room or

c) ESD protected engine room.

Spaces other than engine rooms where machinery is installed which uses hydrogen as fuel shall be subjected to the same requirements as engine rooms.

3.4.2 Requirements for gas safe engine rooms

3.4.2.1 Gas safe engine rooms shall be gas safe under all conditions (“inherently gas safe”). A single failure within the hydrogen system shall not lead to a leakage of gas into the engine room. All gas piping within engine room boundaries shall be enclosed in a gas tight enclosure, e.g. double wall piping or ventilated ducting.

3.4.2.2 In case one barrier fails, the gas supply to the relevant part of the hydrogen system shall be shut down automatically.

3.4.2.3 In addition to the provision of (2.3.4), the ventilation system of ventilated ducting shall:

a) guarantee a sufficient capacity to ensure that the gross volume of air inside the ventilated ducting can be changed at least 30 times per hour;

b) be equipped to detect gas presence continuously in the space between inner and outer pipes; and

c) be independent of all other ventilation systems of the vessel, in particular the ventilation system of the engine room.

3.4.2.4 Where the double wall piping is designed with a vacuum or pressurised annular space, this annular space shall be fitted with:

a) an alarm in case of loss of vacuum or pressure; and

b) a suitable relief device leading to a safe location.

3.4.2.5 Gas safe engine rooms shall be considered as non-hazardous areas, unless the risk assessment according to Article 30.04 demonstrates otherwise.

3.4.3 Requirements for explosion safe engine rooms

3.4.3.1 Arrangements in explosion safe engine rooms shall be such that the rooms are considered gas safe under normal conditions. A single failure within the hydrogen system shall not lead to a gas concentration over 20 % of the LEL into the engine room.

3.4.3.2 In the event of leakage of gas being detected or the ventilation system failing, the gas supply to the relevant part of the hydrogen system shall be shut down automatically.

3.4.3.3 In addition to the provision of (2.3.4), the ventilation system shall:

a) guarantee a sufficient capacity to maintain a gas concentration below 20 % of the LEL in the engine room, and to ensure that the gross volume of air inside the engine room can be changed at least 30 times per hour; and

b) be independent of all other ventilation systems of the vessel.

3.4.3.4 Under normal operation the engine room shall be permanently ventilated with at least 15 changes of the gross volume of air inside the engine room per hour.

3.4.3.5 Explosion safe engine rooms shall be designed to provide a geometrical shape that minimises the accumulation of gases and the formation of gas pockets. A good air circulation shall be ensured.

3.4.3.6 Explosion safe engine rooms shall be considered as Zone 2, unless the risk assessment according to Article 30.04 demonstrates otherwise.

3.4.4 Requirements for ESD protected engine rooms

3.4.4.1 Arrangements in ESD protected engine rooms shall be such that the rooms are considered gas safe under normal conditions, but under certain abnormal conditions may have the potential to become subject to gas hazards.

3.4.4.2 In the event of abnormal conditions involving gas hazards, ESD of non-safe equipment (ignition sources) and gas machinery shall be automatically executed, while equipment or machinery in use or active during these conditions shall be of a certified safe type. Although the master valve is closed immediately, the gas consumer equipment can be stopped with a delay-to achieve depressurisation in the pipes.

3.4.4.3 In addition to the provision of (2.3.4), the ventilation system shall:

a) guarantee a sufficient capacity to maintain a gas concentration below 50 % of the LEL in the engine room,

b) be designed to handle the probable maximum leakage due to technical failures, and

c) be independent of all other ventilation systems of the vessel.

3.4.4.4 Under normal operation the engine room shall be permanently ventilated with at least 15 changes of the gross volume of air inside the engine room per hour.
If gas is detected in the engine room, the number of air changes shall automatically be increased to maintain a gas concentration below 50 % of the LEL.

3.4.4.5 If the vessel is equipped with more than one propulsion engine, these engines shall be located in at least two separate engine rooms. These engine rooms shall have no common partitions. However common partitions may be accepted, if it can be documented that consequences of a single failure will not affect both rooms.

3.4.4.6 Fixed gas warning equipment arranged to automatically delay the shutdown of the gas supply to the engine room concerned and to disconnect all non-explosion protected equipment or installations shall be fitted.

3.4.4.7 ESD protected engine rooms shall be designed to provide a geometrical shape that minimises the accumulation of gases and the formation of gas pockets. A good air circulation shall be ensured.

3.4.4.8 ESD protected engine rooms shall be considered as Zone 1, unless the risk assessment according to Article 30.04 demonstrates otherwise.

3.4.4.9 The gas that remains in the system after closing the emergency shutdown valves shall be safely vented or consumed after leakage of gas being detected, unless it can be documented that the quantity remaining and leaking is so little that the hazard is acceptable.

3.4.4.10 Gas piping in ESD protected engine rooms shall be located as far away as practicable from electrical installations and tanks containing flammable liquids.

3.4.5 Engines

3.4.5.1 Indicators shall be fitted in the wheelhouse and the engine room for:

a) operation of the engine in case of a gas-only engine, or

b) operation and mode of operation of the engine in the case of a dual fuel engine.

3.4.5.2 If incorrect operation of the ignition system, poor combustion or misfiring is detected, which exceeds the inherent safety of the engine, the gas supply system shall be shut down automatically.

3.4.5.3 In case of shut-off of the gas supply system in a dual fuel engine, the engine shall be capable of continuous operation on the other fuel only without interruption. If the fuel supply is not changed over to the other fuel before shutting off the dual fuel engine, the gas supply system from the master fuel valve to the engine and the exhaust system shall be purged in order to discharge any residual gas which may be present.

3.4.6 Exhaust system

3.4.6.1 Exhaust systems shall be designed to keep accumulation of unburnt fuel as low as possible.

3.4.6.2 Unless designed with the strength to withstand the worst case of overpressure due to ignited gas leaks, engine components or systems that can contain an ignitable gas and air mixture, shall be fitted with suitable pressure relief devices.

3.4.6.3 Means shall be provided to monitor and detect incorrect operation of the ignition system, poor combustion and misfiring that may lead to unburnt fuel in the exhaust system during operation.

3.4.6.4 Exhaust pipes of hydrogen engines shall not be connected to the exhaust pipes of other engines or systems."

79. ESI-I-1 is amended as follows:

a) (3.2.3), title (concerns only the German version)

b) (4), item 10 is worded as follows:

"10. In respect of vessels with Union inland navigation certificate allowed to navigate on the Rhine, i.e.

a) those which comply fully with requirements of this Standard including the transitional provisions of Chapter 32 for craft fit to operate on the Rhine (transitional provisions for Zone R), and

b) those which make no use of the transitional provisions of Chapter 323 for craft fit to operate exclusively on waterways outside the Rhine (transitional provisions for No R) or the reductions provided for zZone 4,

the following is to be added to the indent '- on EU waterways in Zone(s)(*)':

a) Rhine or

b) zZone R.

As a reminder, based on Article 1.04 and Annex O of the Rhine vessel inspection regulations (RVIR), the Central Commission for the Navigation of the Rhine (CCNR) has recognised these Union certificates as being equivalent, thereby entitling the holder to travel on the Swiss section of the Rhine as far as the Mittlere Brücke."

c) (4), item 21 is worded as follows:

"21. Dead weight tonnage for cargo vessels in t according to the measurement certificate for the maximum draught according to item 19.

Water Ddisplacement for all other craft in m^3. If no measurement certificate is available, calculate the water displacement from the product of the block coefficient and length L_{WL}, breadth B_{WL} and mean draught at maximum immersion."

d) (4), item 44 is worded as follows:

"44. ~~Row 3: in inland navigation vessel certificates to be renewed before 1.1.2025 (Chapter 33), the item 'according to Article 13.08(2)' shall be crossed if no lifejackets according to this Standard are onboard.~~ The item 'with a set of oars, one mooring line and a bailer' shall be crossed in inland navigation vessel certificates if a new ship's boat in accordance with the European Standard is taken onboard existing craft or for newly-built craft.

~~Row 4: in inland navigation vessel certificates to be renewed after 1.1.2015, or if a new dinghy is taken onboard, or for newly-built craft, the item 'with a set of oars, one mooring line and a bailer' shall be crossed. In inland navigation vessel certificates to be renewed after 1.1.2030 (Chapter 33), and if no dinghy according to this Standard is onboard, the item 'according to Standard EN 1914 : 2016' shall be crossed. In the inland navigation vessel certificate to be renewed before 1.9.2036, if compliance to Standard EN 1914 : 1997 is proven, the item '2016' could be crossed.~~ The item 'in accordance with the European Standard' shall be crossed in inland navigation vessel certificates if no ship's boat according to this Standard is onboard, in application of the transitional provisions in Articles 32.01 or 32.03."

e) (5) (concerns only the Dutch version)

80. ESI-I-2 is amended as follows:

a) The section entitled "Experts" is worded as follows:

"Experts

Experts are required to carry out testing which call for specialist knowledge either on account of the complexity of the systems or on account of the safety level required. The following persons or institutions are among those authorised to carry out such testing:

- Recognised classification societies which have the necessary in-house expertise or which bear responsibility, on the basis of their authorisation, for calling in external persons or institutions and have the necessary quality control systems in place in respect of the selection of these persons or institutions;".

b) In the table in ESI-I-2 under "Testing", the following note is added after the note relating to Article 7.12(12):

"

Article 7.14(8)	Retractable wheelhouses and their appliances	1 year	Competent person

"

c) In the table in ESI-I-2 under "Testing", the following note is added after the note relating to Article 11.08(2):

"

Article 12.04(2) and (3)	Electronic equipment, systems and networks		Competent person

"

81. ESI-II-3 is amended as follows:

a) (2.2) is worded as follows:

"2.2 In accordance with Article 5.04, during the test, vessels shall be loaded as far as possible to 70 – 100 % of their deadweight. This loading condition shall be evaluated in accordance with Annex 2. When the vessel or the convoy is loaded to less than 70 % at the time of the test, the permitted maximum water displacement in downstream navigation shall be set in accordance with the actual load, provided that the limit values of (2.1) are complied with."

b) (2.4) is worded as follows:

"2.4 The permitted maximum water displacement or the respective maximum load or the maximum immersed cross-section for vessels and convoys in downstream navigation shall be determined on the basis of the tests and entered in the inland navigation vessel certificate."

c) Annex 1(3), above table 1, 2nd and 3rd column, 5th and 6th row, is worded as follows:

"% of maximum deadweight: ..... Max water
Power of propulsion engines PB [kW] ..... displacement [m^3]:..... "

d) Annex 2(2) is worded as follows:

"2. Theoretical stopping distances are determined under the standard conditions (S_{SOLL}) of (2.1) of this instruction and under stopping manoeuvre conditions (S_{IST}) and are compared with the stopping distance measured ($S_{MESSUNG}$). The corrected stopping distance of the stopping manoeuvre under standard conditions (S_{NORM}) is calculated as follows:

Formula (2.1) $S_{NORM} = S_{MESSUNG} \cdot \frac{SSOLL}{SIST} \leq$ limit value

in accordance with (2.1)(a) or (b) of this instruction.

When the stopping manoeuvre has been carried out with a load of 70 – 100 % of the maximum deadweight in accordance with (2.2) of this instruction in order to calculate S_{NORM} the water displacement ($DD_{SOLL} = DD_{IST}$) corresponding to the load at the time of the test shall be used for the determination of S_{SOLL} and S_{IST}.

When in determining S_{NORM} according to formula (2.1), the limit value in question is exceeded or not reached, the value of S_{SOLL} shall be reduced or increased by variation of D_{SOLL} so that the limit value is complied with (S_{NORM} = limit value in question). The maximum water displacement permitted in downstream navigation shall be set accordingly."

e) Annex 2(4), legend for the calculation formulae, 4th row, is worded as follows:

"D Water Ddisplacement (m³)"

f) Appendix to Annex 2, example II, (5) is worded as follows:

"5. D^* permissible in downstream navigation

according to formula (2.1) of Annex 2

$$s_{NORM} = s_{MESSUNG} \cdot \frac{s^*_{SOLL}}{s_{IST}} = 550\ m$$

Therefore:

$$s^*_{SOLL} = 550 \cdot \frac{s_{IST}}{s_{MESSUNG}} = s_{I_{SOLL}} + s^*_{II_{SOLL}}$$

$$s^*_{II_{SOLL}} = Const_{SOLL} \cdot D^* = 0{,}04684 \cdot D^*$$

$$D^* = \frac{550 \cdot \frac{475}{580} - 77{,}5}{0{,}04684} = 7950\ [m^3]$$

Consequence:

Since in downstream navigation the permissible water displacement D^* is only 7950 m³ (approximately)

$$\frac{zul.\ Tgf}{\max.\ Tgf} = \frac{D^*}{D_{max}} = \frac{7950}{11960} = 0{,}66$$

The permissible deadweight in this formation is (see (1)):

$0{,}66 \cdot 10700 = \mathbf{7112\ t}$"

82. ESI-II-5 is amended as follows:

a) Appendix 1, Section C, (2), is worded as follows:

"2. Load/water displacement*): ……. t/m³ (corresponding to approximately … % of maximum value)"

b) Appendix 1, Section C, (3), is worded as follows:

"3. Speed of main engine: ..... min^{-1} (corresponding to approximately … % of maximum value)"

c) Appendix 2 (4)(b) is worded as follows:

"b) Load/ water displacement*): ..... t/m^3 (corresponding to approximately … % of maximum value)"

83. ESI-II-6 is amended as follows:

a) Section 1, 2nd and 3rd sentence, is worded as follows:

"The restrictions affect sectors in the horizontal plane (angle of azimuth between 0 and 360° relative to the forward axis of the vessel and in the vertical plane (angle of elevation between -90 and + 90°, relative to the horizontal plane at the eye level of the ~~helmsman~~person at helm).
Depending on whether people are embarking or disembarking, whether the vessel is docking or casting off, whether it is manoeuvring or underway, the ~~helmsman~~person at helm needs to be able to see different sectors of his field of vision."

b) Section 3.1, 2nd sentence, is worded as follows:

"They reflect the incident light according to the law: "angle of incidence = angle of reflection" and afford indirect observation of the desired sector by deflecting the ~~helmsman~~person at helm's field of view."

c) Section 4.1(2) is worded as follows:

"2. Size
The mirror's surface area depends on the width of the sector one wishes to observe and the distance between the ~~helmsman~~person at helm and the mirror."

d) Section 4.1(8) is worded as follows:

"8. Installation position
It must be possible for the helmsman to use the mirror without leaving his ~~post~~work station; it must be sufficient for him to glance at or turn his head towards the mirror. That is why the upper edges of the outer bulkheads (and outer doors as well) of the wheelhouse are well suited as attachment points. The ~~helmsman~~person at helm must have an unobstructed view of the mirror."

*) Delete as appropriate

e) Section 4.2.2(2) is worded as follows:

"2. Monitor location

a) All monitors displaying images from cameras predominantly pointing forward must be within the ~~helmsman~~person at helm's field of vision so that he can see them without excessive movement of the head. They must be sited laterally to coincide with the cameras (port, amidships, starboard).

b) Monitors corresponding to cameras pointed aft can also, for example, be located in a second bank, centrally and on the correct side, below or above the aforementioned monitors. The image display is then consistent with that of the mirrors. If these images are only required when docking or casting off it is useful to locate these monitors on the after wheelhouse bulkhead as the ~~helmsman~~person at helm is in any event looking aft or turning around when performing these manoeuvres. The images then no longer correspond to the mirror image."

f) Section 4.3(1) is worded as follows:

"1. Radar systems
In addition to the minimum requirements and test conditions for navigational radar installations in inland navigation (ES-TRIN, Annex 5, Section I~~I~~) the radar system must comply with the following requirements."

g) Section 4.3(11) is worded as follows:

"11. Monitor location/operation
The radar screen and its controls must be installed in accordance with the requirements for installation and performance tests for navigational radar installations ~~and rate-of-turn indicators in inland navigation~~ (ES-TRIN, Annex 5, Section II~~I~~, Article 2.03~~4~~)."

84. ESI-II-7 is worded as follows:

"ESI-II-7
USED OIL COLLECTION FACILITIES

(Article 8.09)

Existing vessels fit to operate on the Rhine, inspected for the first time before 1994 and in which~~referred to in Article 32.02(1), whose~~ permanently installed bilge pumping and drainage systems and static oil separators have been removed from their engine rooms, no longer comply with Article 5.07 of the RVIR in force as at 31.12.1994.

In absence of~~accordance with the~~ transitional provisions, these vessels must be equipped with a used-oil collection tank referred to in Article 8.09(2), with the exception of those cases referred to in Article 8.09(3).

A transitional provision "N.R.C., at the latest on renewal of the inland navigation vessel certificate after 1.1.2025" is provided for existing vessels which are

- fit to operate exclusively outside the Rhine and
- inspected for the first time before 2009."

85. ESI-II-11(1), last indent, is worded as follows:

"- 30.0~~6~~7"

86. ESI-II-12 (1.4.2) is worded as follows:

"1.4.2 On passenger vessels which do not have a fire alarm system with remote identification of individual manual call points or fire detectors, a fire detection zone shall not comprise more than the area constituted in accordance with Article 19.11(11). The activation of a fire detector in an individual cabin in this fire detection zone shall set off an optical and acoustic signal in the ~~passageway~~corridor outside that cabin."

87. ESI-II-13, title, is worded as follows:

"ESI-II-13
MODEL FOR A LIMITED GENERAL PLAN OF THE ELECTRICAL INSTALLATION FOR CRAFT WHICH WERE LAID DOWN ON OR BEFORE 1 APRIL 19~~76~~83

(Article 32.01(6) ad Article 10.01(2)(a), (b), (c) and (d)~~Article 32.04(3)~~)"

88. ESI-III-1(2) is worded as follows:

"2. Transitional provisions for enclosures made with awnings or similar mobile installations with regard to stability (Article 19.03(5))

Enclosures made with awnings or similar mobile installations can cause problems with the stability of the vessel since, if of sufficient size to do so, they influence the heeling moment due to wind pressure.

Interpretation of the requirement:

In the case of passenger vessels fit to operate on the Rhine and inspected for the first time before 1st January 2006~~for which a vessel certificate was issued for the first time before 1 January 2006 according to RVIR, or for which Article 32.05(2), second sentence, is invoked~~, after the erection of an enclosure made with awnings or similar mobile installations, the transitional provisions related to Article 19.03(5) cannot be invoked if the~~a new stability calculation must be made according to Article 19.04 of this Standard, in so far as its~~ lateral plane A_{wz} exceeds 5 % of the total lateral plane A_w ~~to be taken into account in each case~~initially used for the heeling moment due to wind pressure. In this case**,** a new intact stability calculation must be made according to Article 19.03 of this Standard."

89. ESI-III-2(9) (concerns only the French and Dutch versions)

90. ESI-III-4(7.5) and (7.6) is amended as follows:

"7.5 Electrically powered systems shall meet the requirements of Article 12.06(7) and (8)~~10.19~~ for vibration and heat testing. By way of derogation from Article 12.06(7)~~10.19(2)(c)~~ the heat test may be conducted at a reference ambient temperature of 40 °C.

7.6 Electrically powered systems shall meet the electromagnetic compatibility requirements laid down in Article 12.07(4) and (5)~~10.20~~."

91. ESI-III-5 is amended as follows:

a) (1) and (2) are worded as follows:

"1. In accordance with ~~Sections 32.02(2) and 32.05(5)~~Article 32.01(6) (~~in each case~~ transitional provision to Article 19.01(2)(e) for craft fit to operate on the Rhine) liquefied gas installations for domestic purposes on board existing passenger vessels may only be operated until the ~~first~~ renewal of the inland navigation vessel certificate after 1 January 2045, on condition that a gas warning equipment in accordance with Article 19.15(8) is available.

2. In accordance with Article 19.15(8), liquefied gas installations for domestic purposes may in the future also be installed on passenger vessels put into operation for the first time and of which the length does not exceed 45 m, if such warning equipment is installed at the same time.

~~2. In accordance with Articles 32.02(2) and 32.05(5) (in each case transitional provision to Article 19.15(8)) this gas warning equipment shall be installed on the first renewal of the certificate in accordance with Article 17.15.~~"

b) (4) and (4.1) are worded as follows:

"4. Calibration and inspection of gas ~~leak detectors~~ warning equipment, replacement of parts with limited service life.

4.1 Gas ~~leak detectors~~warning equipment shall be calibrated and inspected by an expert or a competent person as directed by the manufacturer:

a) before being put into service for the first time,

b) before being put back into service after any major modification or repair,

c) regularly,

A calibration and inspection certificate shall be issued, signed by the expert or competent person and showing the date of the inspection."

92. ESI-III-7 is amended as follows:

a) Title (concerns only the French version)

b) Alineas 1 and 2 are worded as follows:

"According to Article 8.05(1), fuel tanks shall form an integral part of the hull or shall be firmly attached to it.

Fuel tanks for engines of working gear on floating equipment do not have to form an integral part of the hull ~~or be firmly attached to it~~. Mobile tanks may be used, provided that they comply with the following conditions:".

93. ESI-III-10 is amended as follows:

a) (2.8)(c), (aa) and (bb), is worded as follows:

"aa) the control units and monitoring instruments are in the forward field of vision and within an arc of not more than 180° (90° to starboard and 90° to port), including the floor and ceiling. They shall be clearly legible and visible from the normal position of the ~~helmsman~~person at helm;

bb) the main control units such as the steering wheel or steering lever, the engine controls, the radio controls, and the controls for the acoustic signals and the warning and manoeuvring signals required under national or international navigational authority regulations, as appropriate, shall be arranged in such a way that the distance between the controls on the starboard side and those on the port side is not more than 3 m. The ~~helmsman~~person at helm shall be able to operate the engines without letting go of the controls for the steering system and while still being able to operate the other controls such as the radio system, the controls for the acoustic signals and the warning and manoeuvring signals required under national or international navigational authority regulations, as appropriate;".

b) (3.5), title, is worded as follows:

"**3.5 (54) – Equivalent manoeuvrability**".

94. ESI-III-11 is amended as follows:

a) Alinea 1 is worded as follows:

"The European Standards series EN 13501 (meaning EN 13501-1 : 2018, EN 13501-2 : 2023, EN 13501-3 : ~~2009~~2025, EN 13501-4 : 2016, EN 13501-5 : 2016 and EN 13501-6 : 2022) and the European Standard EN 45545-2 : 2023 are acceptable test methods for determining the non-flammability of materials, that a material is flame-retardant, or fire resistant, as alternative to the Code for Fire Test Procedures in accordance with Article 19.11(1) of ES-TRIN."

b) (2.3), 1st sentence and table, is worded as follows:

"2.3 Materials which have been tested by an accredited test institution according to the European Standards EN 13501-2 : 2023 and EN 13501-3 : ~~2009~~2025 may be used on-board based on the following correlations.

FTP Code	**EN 13501-2 : 2023 and EN 13501-3 : ~~2009~~2025**
B0	E30
B15	combination of E30 and I15
A0	E60
A30	combination of E60 and I30
A60	combination of E60 and I60 (meaning EI60)

"

95. After ESI-III-12 the following ESI-III-13 is inserted:

"ESI-III-13
INLAND NAVIGATION SWAPPABLE GH_2 TANKS
(Annex 8, Section II, Chapter 3, (2.3.5.1), (2.3.5.5) to (2.3.5.11))

Preface

Swappable GH_2 tanks may be put on a vessel before the vessel's initial inspection and are thereby part of its certification. Swappable tanks may also be built and put on a vessel after the certification of the vessel. Furthermore, the swappable tanks used on a specific vessel may

- also be used on other vessels,
- belong to different owners,
- be operated by different organisations,
- be decommissioned while the vessel is still operating,
- still be in service while the vessel is already decommissioned,
- be severely damaged while not being on the vessel and consequently undergoing major repairs.

Thus, there are many different scenarios inspection bodies must be aware of and consider when inspecting and certifying swappable tanks.

ES-TRIN Annex 8, Section II, Chapter 3, (2.3.5.1) states, that swappable tanks are considered part of the vessel, on which they are placed, and thus subject to the risk assessment according to Article 30.04. The risk assessment and the technical and operational measures arising from it are prerequisite for the certification of the vessel including its swappable tanks. Therefore, it is extremely important that those features of design and build of every swappable tank, which influence its safety and the safety of the vessels on which it will be used, are identical to the features of the swappable thank, which was part of the initial certification of the GH_2 system of those vessels. Only when those features are identical, is a swappable tank suitable for a certain vessel and can be permitted to be used there. If the features of design and build of a swappable tank are not identical but do not negatively affect the risk assessment according to Article 30.04 for a vessel, this swappable tank is also suitable for the vessel and can be permitted to be used there.

The administrative process foreseen in ES-TRIN 2027 for the certification of swappable tanks allows the establishment of tank pools. However, this process does not constitute a type approval process, even though the latter would be a more efficient way of certifying large numbers of swappable tanks.

Explanations and instructions on the application of Annex 8 part 2.3.5 "GH_2 tank swapping systems"

2.3.5.5 is meant to unmistakably identify each swappable tank by appropriate markings. ADR contains extensive requirements for the marking of tanks and similar equipment. Therefore, the wording of 2.3.5.5 is almost entirely copying a small set of the marking requirements of ADR, Chapters 6.7 and 6.8. It is to be expected that most or even almost all swappable tanks for inland navigation vessels will adhere to the requirements of the ADR. Therefore, the inspection body can assume that these swappable tanks already fulfil the requirements of the new 2.3.5.5 and do not need additional markings.

Referring to the same manufacturer's serial number in ADR and ES-TRIN ensures that for each swappable tank, the inspection body can easily cross-reference between inspections and attestation according to ADR and ES-TRIN.

2.3.5.6 is meant to make important information easily available for crew and other personnel handling swappable tanks and to ensure that markings on swappable tanks and on vessels are corresponding to each other.

2.3.5.6 ensures, together with the equivalent marking of the vessel, as required by 2.3.5.8, that the markings on all tanks and all vessels follow the same approach and are therefore compatible in fulfilling the goal of showing the suitability of swappable tanks for specific vessels.

The objective of providing the contact details is to facilitate communication with the operator of the swappable tank when questions related to the safety of the swappable tank occur, for example after damage.

There are no requirements regarding on how to display the information on the operator of the swappable tank, thus they can be painted on the swappable tank. The contact details can be for example a telephone number or a QR code establishing a link to a website with contact details. This is also the main difference to 2.3.5.5, where only the name of the operator on a small metal plate is required.

Therefore, the inspection body cannot demand how the information is displayed. However, it must be assured that the information is easily readable when the tank is installed on the vessel. Reading the information should neither required to be close up or be in a certain position on the vessel.

2.3.5.8 is complementary to 2.3.5.6. The objective of both requirements is providing for crew information on the suitability of the swappable tank for the specific vessel without needing to consult certificates or other documents. The inspection body must ensure, that the respective markings both on the tank and on the vessel are visible while the tank is installed onboard.

2.3.5.7 stipulates the process, by which the suitability of a swappable tank for a specific vessel is certified. Accordingly, the inspection body has to enter the manufacturer's name or mark and serial number in the inland navigation vessel certificate of the vessel.

2.3.5.9 contains the first of the two options for attesting compliance of swappable tanks with the applicable requirements of ES-TRIN. In following this option, the inspection body has to issue the "inland navigation swappable GH_2 tank certificate". The second option, requiring the inspection body to enter all relevant information in the inland navigation vessel certificate, is dealt with in 2.3.5.11.

Swappable tanks are considered being part of the vessel. Therefore, the inspection body has to apply the requirements of ES-TRIN to swappable tanks as well, including requirements related to inspections. Regarding the latter, Article 30.03 and Article 30.11 are of particular relevance.

As for a vessel, any inspection body can inspect a swappable tank, not only the inspection body, which issued the certificate for the vessel(s), on which a swappable tank is used.

The inspection body has to verify that those features or characteristics of design and build of a swappable tank, which influence its safety and the safety of the vessels on which it will be used, are identical to the features of the swappable thank, which was part of the initial certification of the GH_2 system of those vessels. Only when those features are identical, is a swappable tank suitable for a certain vessel and can be permitted to be used there. The same applies, if the features of design and built of a swappable tank are not identical but do not negatively affect the risk assessment according to Article 30.04 for a vessel, on which the swappable tank is to be used. Therefore, only the inspection body, which issued the inland navigation vessel certificate of the vessel with the GH_2 system in the first place, is permitted to certify the suitability of a swappable tank to this vessel.

The inspection body may employ a recognized classification society or in accordance with Article 30.03 a technical service for the inspection and certification of swappable tanks. If that is the case, the certification can be performed as follows:

1. The recognized classification society or the technical service verifies, that a swappable tank fulfils the requirements of ES-TRIN and that its features or characteristics of design and build, which influence its safety and the safety of the vessel on which it will be used,
   a) are identical to the features of the swappable thank, which was part of the initial certification of the GH_2 system of the vessel, or
   b) do not negatively affect the risk assessment according to Article 30.04 for the vessel, on which the swappable tank is to be used.
2. The recognized classification society or the technical service issues a certificate of compatibility of the swappable tank and the vessel on which the tank is to be used.
3. Based on the certificate of compatibility, the inspection body
   a) issues an inland navigation swappable GH_2 tank certificate for the swappable tank in the absence thereof, or
   b) updates an already issued inland navigation swappable GH_2 tank certificate for the swappable tank.

2.3.5.11 contains the second option for attesting compliance of swappable tanks with the applicable requirements of ES-TRIN, as explained under 2.3.5.9. The inspection body can only follow this option, if swappable tanks are used only on one vessel and if they are always inspected at the same time as the vessel. Under these circumstances, this option may be the preferred one. However, if swappable tanks are used on different vessels or if the inspection of the tanks do not coincide with the inspection of the vessel they are used on, this option becomes less practical and should be avoided.

Explanations and instructions on completion of the inland navigation swappable GH_2 tank certificates

Inspection bodies are free to decide on the numbering system for the certificates they issue.

Because the model for the inland navigation swappable GH_2 tank certificate follows the model for the inland navigation vessel certificate, parts 1 to 3 of the ESI-I-1 on the completion of inland navigation vessel certificates apply accordingly.

Explanations of individual items

Self-explanatory items are not mentioned below.

7. According to Article 30.03, the **inspection body** may employ a technical service for the inspection and certification of swappable tanks. The approved technical services are named on the website of CESNI (“Lists of approved authorities, firms, installations and equipment in the field of technical requirements for inland navigation vessels”, https://listes.cesni.eu/6000-en.html.)

10. Item 10 should be used to enter useful references to documentation, inspections or other aspects of the swappable tank having its legal basis in the ADR.”

96. ESI-IV-1 is worded as follows:

“PART IV
TRANSITIONAL PROVISIONS

ESI-IV-1
APPLICATION OF TRANSITIONAL PROVISIONS

(Chapter 32 ad Chapters 3 to 30)

1. Purpose of transitional provisions

The application of the requirements of ES-TRIN to existing vessels is governed by transitional provisions. These provisions outline a gradual adaptation process for the existing fleet with specific deadlines. All transitional provisions for the different groups of vessels (whether they are fit to operate on the Rhine or not, and depending on the periods when their certificates were issued**)** are consolidated in a single table, making the specific deadlines easy to read and differentiate.

2. General principles

ES-TRIN applies to craft which are already in service. However, transitional provisions apply to these craft in accordance with the deadlines and provisions listed in the table under Article 32.01(6).

If transitional provisions cannot be invoked, the existing vessel is treated as newly built vessel.

Transitional provisions shall not apply to a craft if

a) this craft is inspected for the first time, or

b) the date of the first inspection is after the date of the fourth column of the table under Article. 32.01(6), or

c) the date of the current inspection is after the deadline of transitional provision in the fifth column of the table under Article 32.01(6), or

d) this craft has once fulfilled the requirement referred to by the transitional provision, or

e) parts or areas of this craft have been replaced or converted, and these replacements or conversions concern the parts, areas, installations, equipment or devices referred to in the transitional provisions.

3. Single table

The single table is divided into several columns to clearly indicate the following for each transitional provision:

- The reference in ES-TRIN of the article, paragraph, sentence of the original requirement,
- A reminder of the subject of the original requirement,
- The comments and deadline of the transitional provision.

Where the transitional provision does not cover the entirety of the requirement in ES-TRIN, and referencing an article, number, letter, or sentence is not sufficient to precisely identify the relevant part to which the transitional provision applies, the entry in the ‘subject’ column is marked by the symbol “*” to narrow the scope.

Examples:

- Article 3.03(2) - Hull

  Several transitional provisions are foreseen for Article 3.03(2), each with a different scope and deadline. They do not apply uniformly to the entire requirement or to all groups of vessels, as their applicability depends on whether they concern accommodation or safety installations, and where these are located - either ahead of the plane of the collision bulkhead or aft of the aft-peak bulkhead.

- Article 7.12(8), 4th sentence - Elevating wheelhouses

  ES-TRIN states that all lowering operations shall automatically trigger both an optical and a clearly audible acoustic warning signal. The transitional provision applies only to the optical signal; no transitional provision is foreseen for the acoustic signal.

In line with the two criteria that the inspection body shall verify (see Article 32.01(4)), two columns allow clear identification of the transitional provisions applicable to a vessel:

- ‘Rhine / no Rhine’: whether the vessel is fit to operate on the Rhine or not;
- ‘First certificate issued before’: the date of the first inspection.

4. Criteria to benefit from the transitional provisions

To benefit from the transitional provisions for **vessels fit to operate on the Rhine**, the vessel must have been inspected, and a certificate must have been granted in accordance with the type and date referred to in Article 32.01(2)(a), (b) or (c), meaning:

- a Rhine vessel certificate, or
- a Community certificate Zone R on or after 30 December 2008, or
- a Union certificate Zone R on or after 7 October 2018.

Other traffic licences, such as a Community certificate issued for the first time before 2008, do not allow to benefit from the transitional provisions for the Rhine.

To benefit from the transitional provisions for vessels fit to operate **exclusively on waterways outside the Rhine,** the vessel must have been inspected, and a certificate must have been granted in accordance with the type and date referred to in Article 32.01(3)(a) or (b).
For vessels fit to operate **exclusively on waterways outside the Rhine** but that have been certified to navigate on waterways of Zone 4 only, transitional provisions in accordance with Article 32.01(3) may also be applicable if the vessels want to get a certification to navigate on waterways of Zone 3, but not in Zone R.

5. Switching from Rhine vessel inspection certificate to Union certificate (and vice-versa)

There is no longer any link between having a valid Rhine vessel inspection certificate and being allowed to apply transitional provisions. If a shipowner can demonstrate that a Rhine vessel inspection certificate has been issued for the vessel in the past, the Inspection body may issue a new Rhine vessel inspection certificate on the basis of this certificate. The Inspection body will verify the date of the first inspection and the certified operating area.

In practice, this may mean that if a vessel does not currently have a valid Rhine vessel inspection certificate, but a Rhine vessel inspection certificate was issued for this vessel in the past, this old certificate entitles the vessel to be certified for a new Rhine vessel inspection certificate with transitional provisions remaining in force.

This applies to:

- Vessels that have not had a valid certificate for a long time;
- Vessels with currently a Union certificate for inland navigation vessels Zone R;
- Vessels with currently a Union certificate for inland navigation vessels without Zone R.

Of course, the vessel must be adapted to comply with the requirements of ES-TRIN for which the transitional provisions for Rhine navigation have already expired. The Inspection body carefully verifies that these requirements are met, alongside of the first inspection and the certified operating area.

Three specific examples can be given:

- A vessel with a Union Certificate for inland navigation vessels Zone R issued after 7 October 2018 (and therefore complying with the requirements of ES-TRIN for which the transitional provisions for Rhine navigation have already expired) can obtain a Rhine vessel inspection certificate.
- A vessel that previously had a Rhine vessel inspection certificate, but had it replaced by a Community certificate due to the expiration of transitional provisions, can obtain a new Rhine vessel inspection certificate provided that it fully complies with ES-TRIN, including the requirements for which the transitional provisions for Rhine navigation have already expired.
- A vessel with a Community certificate issued for the first time before 2008 cannot obtain a Rhine vessel inspection certificate or Union Certificate for inland navigation vessels Zone R (see certificates accepted in Article 32.01(2) last sentence).

6. Implications of a vessel's expired certificate

Although the Directive (EU) 2016/1629 / RVIR require that a craft shall be subjected to a periodical inspection before expiry of the validity of its Union certificate (Article 12, and Annex V, Article 2.09) / Rhine vessel inspection certificate (RVIR, Article 2.09(1)), they do not specify the consequences if this obligation is not met.

No provision in the Directive / RVIR states or necessarily implies that vessels with an expired certificate should be considered as newly built vessels (for which, as a consequence, the transitional provisions shall not apply).

The obligation to undergo periodical inspections is however crucial for safety of navigation. To ensure compliance with the obligations arising out of the Directive / RVIR, Member States shall adopt rules on penalties applicable to infringements which are effective, proportionate and dissuasive.

7. Application of transitional provisions in joining together parts of craft

7.1 Principles

Where parts of different vessels are joined together, status quo protection shall be granted only for the parts which belong to the vessel which retains its inland navigation vessel certificate. Transitional provisions may therefore be invoked only for those parts. Other parts shall be treated as a newly built vessel.

7.2 Application of the transitional provisions in detail

7.2.1 Where parts of different vessels are joined together, transitional provisions may be invoked only for those parts which belong to the vessel which retains its inland navigation vessel certificate.

7.2.2 Parts which do not belong to the vessel which retains its vessel certificate shall be treated as a newly built craft.

7.2.3 After a vessel has had part of another vessel added to it, the former shall receive the ENI number of the craft, which retains its inland navigation vessel certificate as the converted craft.

7.2.4 Where an existing inland navigation vessel certificate is retained or a new inland navigation vessel certificate is issued for a craft after a conversion, the year of construction of the oldest part of the craft shall additionally be entered in the inland navigation vessel certificate.

7.2.5 If a new fore section is attached to a craft, the engine for the bow thruster system installed in the fore section shall also comply with the current requirements.

7.2.6 If a new stern section is attached to a vessel, the engines installed in the stern section shall also comply with the current requirements.

7.3 Examples

7.3.1 A vessel is put together from two older vessels (vessel 1 year of construction 1968; vessel 2 year of construction 1972). The whole of vessel 1 apart from the fore section is used; of vessel 2, the fore section is used. The assembled vessel receives vessel 1's inland navigation vessel certificate. The fore section of the assembled vessel must now be fitted inter alia with anchor niches.

7.3.2 A vessel is put together from two older vessels (vessel 1 year of construction 1975; vessel 2 year of construction 1958, oldest component 1952). The whole of vessel 1 apart from the fore section is used; of vessel 2, the fore section is used. The assembled vessel receives vessel 1's inland navigation vessel certificate. The fore section of the assembled vessel must now be fitted inter alia with anchor niches. The oldest component from the original vessel 2, with year of construction 1952, is additionally entered in the inland navigation vessel certificate.

7.3.3 The stern section of a vessel of year of construction 2001 is attached to a vessel of year of construction 1988. The engine of the vessel of year of construction 1988 is to remain in the vessel. In this case, the engine has to be type approved. The engine would also have to be type approved if it was the engine in the 2001 stern section.

8. Application of transitional provisions in the case of a change in the type of craft (intended use of the craft)

8.1 Principles

8.1.1 In any decision on the application of transitional provisions in the case of change of the type of craft (vessel type; intended use of the vessel), as regards to this Standard safety considerations shall be key.

8.1.2 It shall constitute a change in the type of craft if the safety requirements applying to the new type of craft are different from those for the old type of craft; this is so if special provisions of Chapters 19 to 25 and 27 to 30 of this Standard are applicable to the new type of craft which were not applicable to the old type of craft.

8.1.3 In the case of a change in the type of craft, all special provisions of Chapters 19 to 25 and 27 to 30 and all requirements specific to this type of craft shall be complied with fully; transitional provisions may not be invoked for these requirements. This also applies to parts which are taken over from the existing craft and come under these special requirements.

8.1.4 The conversion of a tanker into a dry cargo vessel shall not constitute a change in the type of craft as defined in 8.1.2.

8.1.5 In the case of conversion of a cabin vessel into a day-trip vessel, all new parts shall comply fully with the current requirements.

8.2 Application of the transitional provisions in detail

8.2.1 Article 32.01(6) applies to the parts of the craft that are renewed; hence new parts of the craft cannot be subject to the transitional provisions.

8.2.2 For the parts of the craft that are not converted or replaced, the transitional provisions shall continue to be applicable with the exception of parts according to 8.1.3, second sentence.

8.2.3 If the dimensions of the craft are modified, the transitional provisions no longer apply to those parts of the craft that are connected with this modification (e.g. distance of collision bulkhead, freeboard and anchor).

8.2.4 In the case of a change in the type of craft, the special requirements that only apply to the new type of craft shall be applicable. All parts and items of equipment that are affected by the conversion of the craft must satisfy the current requirements Part II and III of this Standard.

8.2.5 The craft shall then be granted a new or amended inland navigation vessel certificate and a note shall be made in items 7 and 8 of the certificate both of the original construction and of the conversion.

8.3 Examples

8.3.1 A cargo vessel (year of construction 1996) is converted into a passenger vessel. Chapter 19 of this Standard then applies to the whole vessel, without invoking transitional provisions. If the fore section is not modified either according to the conversion plans or in accordance with Chapter 19, the vessel does not need to present any anchor niches in accordance with Article 3.03(7).

8.3.2 A tug (year of construction 1970) is converted into a pusher. The physical conversion consists solely of changing the deck equipment and installing a pushing device. All transitional provisions for a 1970 vessel remain applicable, except for the Chapters 5, 7 (in part), Article 13.01 and Article 21.01.

8.3.3 A motor tanker (year of construction 1970) is converted into a pusher. The physical conversion consists of separating off the fore section and the cargo section, as well as changing the deck equipment and installing a pushing device. All transitional provisions for a 1970 vessel remain applicable, except for the provisions of Chapters 5, 7 (in part), Article 13.01 and Article 21.01.

8.3.4 A motor tanker is converted into a motor cargo vessel. The motor cargo vessel must comply with current work station safety requirements, particularly those referred to in Article 14.04.

9. Application of transitional provisions in the case of conversion of passenger vessels

9.1 Application of the transitional provisions

9.1.1 Conversion measures that are necessary in order to comply with requirements of Chapter 19, no matter when they are carried out, shall not constitute conversion 'C' within the meaning of Article 32.01(6).

9.1.2 In the case of conversion of a cabin vessel into a day-trip vessel, all new parts shall comply fully with the current requirements.

9.2 Examples

9.2.1 A passenger vessel undergoes conversions to comply with the requirements of ES-TRIN. If no other voluntary conversions are made on this passenger vessel, it is not necessary to carry out a stability calculation in accordance with the requirements in Chapter 19 of this Standard. However, in case of any conversion, especially if the vessel's weight, draught, trim or watertight bulkheads are affected, a stability calculation becomes necessary. This stability calculation can be carried out in accordance with the original stability requirements the vessel had to fulfil by the time of the last required calculation.

9.2.2 A passenger vessel with a length L_{WL} of not more than 25 m (year of construction 1994, inland navigation vessel certificate last renewed 2012) is extended by 10 m in 2016. As a result of this conversion, the vessel no longer benefits from the derogations granted under Article 19.15(9). The vessel must be equipped with a second independent propulsion system. A new stability calculation is necessary, which must be carried out in accordance with requirements in Chapter 19 of this Standard, notably those for the one-compartment status and the two-compartment status.

9.2.3 A passenger vessel (year of construction 1988) receives a more powerful propulsion system including propellers. As a result the vessel's speed exceeds reasonably the value referred to in the stability calculation. The conversion is voluntary as the vessel fulfilled the requirements on minimum speed and manoeuvrability before. This is such a major conversion that a stability calculation is required. This must be carried out in accordance with requirements in Chapter 19 of this Standard. As the hull, watertight bulkheads and superstructure are not converted, the damage stability calculation can be carried out without the two-compartment status or in accordance with the original damage stability requirements the vessel had to fulfil by the time of the last required calculation.

9.2.4 A passenger vessel (year of construction 1992) is converted from diesel powered propulsion to an electric propulsion system. A new accumulator room is installed in a void space. The watertight bulkheads and superstructure of the vessel remain unchanged. The conversion is voluntary but a measure to significantly lower emissions. The vessel has the same speed and manoeuvrability characteristics as before. If the weight, the draught or the trim of the vessel is affected, a stability calculation becomes necessary. In this case the stability calculation can be carried out in accordance with the original stability requirements the vessel had to fulfil by the time of the last required calculation.

9.2.5 The maximum permitted number of passengers on board a passenger vessel is increased. In this case the intact stability calculation shall be carried out in accordance with the provisions of Chapter 19 of this Standard. The damage stability calculation can be carried out in accordance with the original stability requirements the vessel had to fulfil by the time of the last required calculation, but taking into account the increased passenger number.

10. Reference to European or international standards

For any reference to a new edition or revision of EN, ISO, IEC standards: See Article 32.02."

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