



Economic and Social Council

Distr.: General
11 June 2024

Original: English

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Dangerous Goods

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

Forty-fourth session

Geneva, 26-30 August 2024

Item 3 (c) of the provisional agenda

Implementation of the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN): interpretation of the Regulations annexed to ADN

"HGK/Seafar" project on the use of remote control technology on inland waterway vessels transporting goods that fall under the scope of the ADN – Phase 2 and 3a

Submitted by the European Barge Union and the European Skippers Organization (EBU/ESO)*, **

Introduction

1. Several market participants are carrying out test runs with remote-controlled inland waterway vessels. The projects are currently taking place on the Rhine and other waterways in several European countries.
2. The Central Commission for the Navigation of the Rhine and various national authorities have already granted permission to individual vessels for remote-controlled navigation.
3. Tank vessels currently also use remote control technology to transport goods that fall under the scope of the ADN.
4. The ADN Safety Committee has already dealt with the issue of remote control of inland navigation vessels on several occasions (see informal document INF.3 of the fortieth session), most recently in January 2024 (informal document INF.19 of the forty-third session)

* Distributed in German by the Central Commission for the Navigation of the Rhine under the symbol CCNR-ZKR/ADN/WP.15/AC.2/2024/48.

** A/78/6 (Sect. 20), table 20.5

5. At the forty-third session of the ADN Safety Committee, the HGK and Seafar project on remote control technology was presented once again and the individual project phases were explained as well.

Request

6. As it is not definitely clear from the report of the forty-third session of the ADN Safety Committee whether the ADN Safety Committee is of the opinion that there is no deviation from any provisions of the ADN in project phases 2 and 3a, during which the responsible master of the vessel is on board throughout the entire period of the transport, EBU/ESO request that this is checked and confirmed for phases 2 and 3a including the annex to this document.

Annex

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)

| | |
|----------|---|
| | <i>Full Crew</i> |
| PHASE 2 | Full crew on board + Operator in ROC acts as helmsman under the supervision of the boat master on board |
| PHASE 3a | <i>Deviation from the regulation</i> Deviation from the regulation means, either Adaption of operation mode (A1/A2 → B) Crew-Reduction with responsible boat master remaining on board |

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (2023, Volume I)

*Phase 2
Full Crew*

*Phase 3a
Crew-reduction*

1.2.1 Definitions

Consignor means the enterprise which consigns dangerous goods either on its own behalf or for a third party. If the transport operation is carried out under a contract for carriage, consignor means the consignor according to the contract for carriage. In the case of a tank vessel, when the cargo tanks are empty or have just been unloaded, the master is considered to be the consignor for the purpose of the transport document;

Consignor: no change compared to existing modes of operation

Consignor: no change compared to existing modes of operation

Master means a person as defined in Article 1.02 of the European Code for Inland Waterways (CEVNI);

Master: no change compared to existing modes of operation

Master: no change compared to existing modes of operation

1.4.2.2 Carrier - 1.4.2.2.1 g)

In the context of 1.4.1, where appropriate, the carrier shall in particular:

There is no difference between phase 2, where the full crew remains onboard, and the conventional

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

| <i>European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)</i> (2023, Volume I) | <i>Phase 2</i> <i>Full Crew</i> | <i>Phase 3a</i> <i>Crew-reduction</i> |
|---|---|--|
| (g) provide the master with the required instructions in writing and ascertain that the prescribed equipment is on board the vessel; | situation because the responsible boat master remains onboard. The carrier can still provide the onboard master with the required instructions in writing and ensure that the prescribed equipment is on board the vessel. | The carrier can still provide the onboard master with the required instructions in writing and ensure that the prescribed equipment is on board the vessel. |
| 1.4.3.3 Filler - 1.4.3.3 v) In the context of 1.4.1, the filler has the following obligations in particular: <i>Obligations concerning the bulk loading of dangerous solids in vessels:</i> | There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard. The filler can still guarantee and document that the maximum permissible temperature of the cargo is not exceeded and shall provide instructions to the master in a traceable form. | There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard. The filler can still guarantee and document that the maximum permissible temperature of the cargo is not exceeded and shall provide instructions to the master in a traceable form. |
| 1.8.1.2.1 Monitoring procedure In order to carry out the checks provided for in Article 4, paragraph 3 of ADN, the Contracting Parties shall use the checklist developed by the Administrative Committee. A copy of this checklist shall be given to the master of the vessel. Competent authorities of other Contracting Parties may decide to simplify or refrain from conducting subsequent checks if a copy of the checklist is presented to them. This paragraph shall not prejudice the right of Contracting Parties to carry out specific measures or more detailed checks. | There is no difference between phase 2, where the full crew remains onboard, and the conventional situation as the responsible boat master remains onboard. The Master onboard can still use the ADN-checklist. | There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard. The Master onboard can still use the ADN-checklist. |

1.10.1.4 For each crewmember of a vessel carrying dangerous goods, means of identification, which includes a photograph, shall be on board during carriage.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

The means of identification, which includes a photograph, of the remote operator shall be present at the Remote Operations Center.

The means of identification, which includes a photograph, of the remote operator shall be present at the Remote Operations Center.

Column (20) "Additional requirements/remarks"

This column contains the additional requirements or remarks applicable to the vessel.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

These additional requirements or remarks are:

28 (b) When during the carriage of UN 2448 SULPHUR, MOLTEN, the concentration of hydrogen sulphide exceeds 1.85%, the boat master shall immediately notify the nearest competent authority.

If the concentration of hydrogen sulphide during the carriage of UN 2248 SULPHUR/MOLTON exceeds 1.85%, the boat master can still immediately notify the nearest competent authority.

If the concentration of hydrogen sulphide during the carriage of UN 2248 SULPHUR/MOLTON exceeds 1.85%, the boat master can still immediately notify the nearest competent authority.

When a significant increase in the concentration of hydrogen sulphide in a hold space leads it to be supposed that the sulphur has leaked, the cargo tanks shall be unloaded as rapidly as possible. A new load may only be taken on board once the authority which issued the certificate of approval has carried out a further inspection.

Column (20) "Additional requirements/remarks"

There is no difference between phase 2, where the full crew remains onboard, and the conventional

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)
(2023, Volume I)

Phase 2
Full Crew

Phase 3a
Crew-reduction

This column contains the additional requirements or remarks applicable to the vessel.

These additional requirements or remarks are:

33 (m) The following provisions are applicable to transport of this substance:

Master

If the temperature rise exceeds 4 °C for 2 hours or if the temperature in the cargo tanks exceeds 40 °C, the master must contact the consignor directly, with a view to taking any action that might be necessary.

situation because the responsible boat master remains onboard.

The boat master can still contact the consignor if the temperature rises more than 4 °C for 2 hours or if the temperature in the cargo tanks exceeds 40 °C.

The boat master can still contact the consignor if the temperature rises more than 4 °C for 2 hours or if the temperature in the cargo tanks exceeds 40 °C.

Column (20) "Additional requirements/remarks"

This column contains the additional requirements or remarks applicable to the vessel.

These additional requirements or remarks are:

33 (o) The following provisions are applicable to transport of this substance:

Filler

Only those hydrogen peroxide solutions which have a maximum decomposition rate of 1.0 per cent per year at 25 °C may be carried. A certificate from the filler stating that the product meets this standard must be

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

The certificate from the filler stating that the product meets this standard can still be presented to the master and kept on board. The authorized representative of the manufacturer can still be on board to monitor the loading operations and test the stability of the hydrogen peroxide solutions to be transported. They can still certify to the master that the cargo has been loaded in a stable condition.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

The certificate from the filler stating that the product meets this standard can still be presented to the master and kept on board. The authorized representative of the manufacturer can still be on board to monitor the loading operations and test the stability of the hydrogen peroxide solutions to be transported. They can still certify to the master that the cargo has been loaded in a stable condition.

presented to the master and kept on board. An authorized representative of the manufacturer must be on board to monitor the loading operations and to test the stability of the hydrogen peroxide solutions to be transported. He shall certify to the master that the cargo has been loaded in a stable condition.

Special provision 803 b)

Hard coal, coke and anthracite, when carried in bulk, are not subject to the provisions of ADN, if:

- (a) The temperature of the cargo has been determined using an appropriate procedure and is not higher than 60°C before, during or immediately after loading of the hold;
- (b) Depending on the temperature of the cargo before, during and immediately after loading of the hold, the expected duration of carriage without temperature monitoring does not exceed the maximum number of days shown in the table below:

| Maximum temperature on loading (°C) | Maximum duration of journey (days) |
|-------------------------------------|------------------------------------|
| 60 | 10 |
| 50 | 18 |
| 40 | 32 |
| 30 | 57 |

- (c) Where the effective duration of carriage exceeds the maximum duration shown in sub-paragraph (b), temperature monitoring is carried out from the first day over the

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

The onboard boat master can receive the required information at loading.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

The onboard boat master can receive the required information at loading.

maximum duration. The necessary monitoring apparatus shall be on board as from the first day of the carriage following the maximum duration of the journey;

- (d) The master is given, at the time of loading and in a traceable form, instructions on how to proceed if there is a significant heating of the cargo.

5.4.1.1.6.5

For tank vessels with empty cargo tanks or cargo tanks that have been discharged, the master is deemed to be the consignor for the purpose of the transport documents required. In this case, the following particulars shall be entered on the transport document for each empty cargo tank or cargo tank that has been discharged:

- (a) the number of the cargo tank;
- (b) the UN number preceded by the letters "UN" or the substance identification number;
- (c) the proper shipping name of the last substance carried, the class and, if applicable, the packing group in accordance with 5.4.1.1.2.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

The master can still act as the consignor for the transport documents required in the case of tank vessels with empty cargo tanks or cargo tanks that have been discharged.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

The master can still act as the consignor for the transport documents required in the case of tank vessels with empty cargo tanks or cargo tanks that have been discharged.

5.4.3 Instructions in writing - 5.4.3.2

There is no difference between phase 2, where the full crew remains onboard, and the conventional

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

These instructions shall be provided by the carrier to the master in the language(s) that the master and the expert can read and understand before loading. The master shall ensure that each member of the crew and any other person on board concerned understands and is capable of carrying out the instructions properly.

situation because the responsible boat master remains onboard.

The carrier can still provide these instructions to the master in a language(s) that both the master and the expert can read and understand before loading. The master must ensure that every crew member and any other person on board concerned understands and is capable of carrying out the instructions properly.

The carrier can still provide these instructions to the master in a language(s) that both the master and the expert can read and understand before loading. The master must ensure that every crew member and any other person on board concerned understands and is capable of carrying out the instructions properly.

7.1.3.15 Expert on board the vessel

When dangerous goods are carried, the responsible master shall at the same time be an expert according to 8.2.1.2.

NOTE: Which master of the vessel's crew is the responsible master shall be determined and documented on board by the carrier. If there is no such determination, the requirement applies to every master.

By derogation from this, for the loading and unloading of dangerous goods in a barge, it is sufficient that the person who is responsible for loading and unloading and for ballasting of the barge has the expertise required according to 8.2.1.2.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

7.1.4.11. Stowage plan - 7.1.4.11.1

The master shall enter on a stowage plan the dangerous goods stowed in the individual holds or on deck. The goods shall be described as in the transport document in accordance with 5.4.1.1.1 (a), (b), (c) and (d).

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

| <i>European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)</i> (2023, Volume I) | <i>Phase 2</i> <i>Full Crew</i> | <i>Phase 3a</i> <i>Crew-reduction</i> |
|---|---|--|
| <p>7.1.4.14.7.1 Segregation - 7.1.4.14.7.1.3</p> <p>No persons other than the master of the vessel or the driver of the vehicle embarked, persons who are on board for duty reasons and the other members of the crew shall be permitted in vessels carrying packages, overpacks or containers bearing category II-YELLOW or III-YELLOW labels.</p> | <p>There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.</p> | <p>There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.</p> |
| <p>7.1.5.4.2</p> <p>An expert in accordance with 8.2.1.2 shall be permanently on board berthed vessels for which marking is prescribed in column (12) of Table A of Chapter 3.2</p> | <p>There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.</p> | <p>There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.</p> |
| <p>7.1.5.8 Reporting Duty - 7.1.5.8.1</p> <p>In the States where the reporting duty is in force, the master of the vessel shall provide information in accordance with paragraph 1.1.4.6.1.</p> | <p>There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.</p> | <p>There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.</p> |
| <p>7.1.6.16 Measures to be taken during loading, carriage, unloading and handling of cargo</p> <p>The following additional requirements shall be met when they are indicated in column (11) of Table A of Chapter 3.2:</p> <p>IN01: After loading and unloading of these substances in bulk or unpackaged and before leaving the cargo transfer site, the concentration of flammable gases and vapours given off by the cargo in the accommodation,</p> | <p>There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.</p> | <p>There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.</p> |

engine rooms and adjacent holds shall be measured by the loader or unloader or by an expert according to 8.2.1.2 using a gas detector. The results of the measurement shall be recorded in writing.

Before any person enters a hold and prior to unloading, the concentration of flammable gases and vapours given off by the cargo shall be measured by the unloader of the cargo or by an expert according to 8.2.1.2. The results of the measurement shall be recorded in writing.

The hold shall not be entered or unloading started until the concentration of flammable gases and vapours given off by the cargo in the airspace above the cargo is below 50% of the LEL.

If the concentrations of flammable gases and vapours given off by the cargo is not below 50% of the LEL safety measures shall be taken immediately by the loader, the unloader or the responsible master.

IN03: If a hold contains these substances in bulk or unpackaged, the master shall make sure every day by checking the hold bilge wells or pump ducts that no water has entered the hold bilges.

Water which has entered the hold bilges shall be removed immediately.

7.2.3.7.1 Degassing of empty or unloaded cargo tanks and piping for loading and unloading – 7.2.3.7.1.5

The marking prescribed in 7.2.5.0.1 may be withdrawn by order of the master when, after degassing of the cargo tanks, it has been ascertained, using the equipment described in column (18) of Table C of

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

| <i>European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)</i> <i>(2023, Volume I)</i> | <i>Phase 2</i> <i>Full Crew</i> | <i>Phase 3a</i> <i>Crew-reduction</i> |
|---|------------------------------------|--|
|---|------------------------------------|--|

Chapter 3.2, that none of the cargo tanks contain flammable gases and vapours in concentrations of more than 20% of the LEL or contain a concentration of toxic gases and vapours which exceeds national accepted exposure levels. The result of the measurement shall be recorded in writing.

7.2.3.7.2. Degassing of empty or unloaded cargo tanks and piping for loading and unloading to reception facilities - 7.2.3.7.2.2

Before the degassing operation commences, the degassing vessel shall be earthed. The master of the degassing vessel or an expert according to 8.2.1.2 mandated by him and the operator of the reception facility shall have filled in and signed a checklist confirming with 8.6.4 of ADN.

The checklist shall be printed at least in languages understood by the master or the expert and the operator of the reception facility.

If a positive response to all the questions is not possible, degassing to a reception facility is only permitted with the consent of the competent authority.

7.2.3.7.2. Degassing of empty or unloaded cargo tanks and piping for loading and unloading to reception facilities - 7.2.3.7.2.5

The marking prescribed in column (19) of Table C of Chapter 3.2 may be withdrawn by order of the master when, after degassing of the cargo tanks, it has been ascertained, using the equipment described in column (18) of Table C of Chapter 3.2, that none of the cargo

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

tanks contain flammable gases and vapours in concentrations of more than 20% of the LEL or contain a concentration of toxic gases and vapours which exceeds national accepted exposure levels. The result of the measurement shall be recorded in writing.

7.2.3.15 Expert on board the vessel

When dangerous substances are carried, the responsible master shall at the same time be an expert according to 8.2.1.2. In addition this expert shall be:

- An expert as referred to in 8.2.1.5 when dangerous goods are carried for which a type G tank vessel is prescribed in column (6) of Table C of Chapter 3.2; and
- An expert as referred to in 8.2.1.7 when dangerous goods are carried for which a type C tank vessel is prescribed in column (6) of Table C of Chapter 3.2.

NOTE: Which master of the vessel's crew is the responsible master shall be determined and documented on board by the carrier. If there is no such determination, the requirement applies to every master.

By derogation from this, for the loading and unloading of dangerous goods in a tank barge, it is sufficient that the person who is responsible for loading and unloading and for ballasting of the tank barge has the expertise required according to 8.2.1.2.

During the carriage of goods for which a type C tank vessel is prescribed in column (6) of Table C of Chapter 3.2 and cargo tank type 1 in column (8), an expert

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)
(2023, Volume I)

Phase 2
Full Crew

Phase 3a
Crew-reduction

referred to in 8.2.1.5 for carriage in type G vessels is sufficient.

7.2.4.10 Checklist - 7.2.4.10.1

Loading or unloading shall start only once a checklist conforming with section 8.6.3 of ADN has been completed for the cargo in question and questions 1 to 19 of the list have been checked off with an "X". Irrelevant questions should be deleted. The list shall be completed, after the pipes intended for the handling are connected and prior to the handling, in duplicate and signed by the master or a person mandated by him and the person responsible for the handling at the shore facilities. If a positive response to all the questions is not possible, loading or unloading is only permitted with the prior consent of the competent authority.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

7.2.4.10 Checklist - 7.2.4.10.3

The checklist shall be printed at least in languages understood by the master and the person responsible for the handling at the shore facilities.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

7.2.4.11 Loading plan - 7.2.4.11.2

The master shall enter on a cargo stowage plan the goods carried in the individual cargo tanks. The goods shall be described as in the transport document (information according to 5.4.1.1.2 (a) to (d)).

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

7.2.4.13 Measures to be taken before loading - 7.2.4.13.1

When residues of the previous cargo may cause dangerous reactions with the next cargo, any such residues shall be properly removed.

Substances which react dangerously with other dangerous goods shall be separated by a cofferdam, an empty space, a pump-room, an empty cargo tank or a cargo tank loaded with a substance which does not react with the cargo.

Where an empty, uncleaned cargo tank, or a cargo tank containing residues of previous cargo of a substance liable to react dangerously with other dangerous goods, this separation is not required if the master has taken appropriate measures to avoid a dangerous reaction.

If the vessel is equipped with piping for loading and unloading below the deck passing through the cargo tanks, the mixed loading or carriage of substances likely to react dangerously with each other is prohibited.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

7.2.4.16 Measures to be taken during loading, carriage, unloading and handling - 7.2.4.16.16

Measures to be taken before loading refrigerated liquefied gases

Unless the temperature of the cargo is controlled in accordance with 9.3.1.24.1 (a) or 9.3.1.24.1 (c) guaranteeing the use of the maximal boil-off in any service conditions, the holding time has to be determined by the master or another person on his behalf before loading and validated by the master or

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)
(2023, Volume I)

Phase 2
Full Crew

Phase 3a
Crew-reduction

another person on his behalf during loading and shall be documented on board.

7.2.4.16 Measures to be taken during loading, carriage, unloading and handling - 7.2.4.16.17

Determination of the holding time

A table, approved by the recognized classification society that certified the vessel, giving the relation between holding time and filling conditions, incorporating the parameters below shall be kept on board.

- The holding time of the cargo shall be determined on the basis of the following parameters:
- The heat transmission coefficient as defined in 9.3.1.27.9;
- The set pressure of the safety valves;
- The initial filling conditions (temperature of cargo during loading and degree of filling);
- The ambient temperatures as given in 9.3.1.24.2;
- When using the boil-off vapours, the minimum guaranteed use of the boil-off vapours (that is the amount of boil-off vapours used under any service conditions), may be taken into account.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

Adequate safety margin

To leave an adequate margin to ensure safety, the holding time is at least three times the expected duration of the journey of the vessel, including the following:

- To ensure safety for short journeys of (as expected) no more than 5 days, the minimum holding time for any vessel with refrigerated liquefied gases is 15 days.
- For long journeys of (as expected) more than 10 days, the minimum holding time shall be 30 days, adding two days for each day the journeys takes more than 10 days.

As soon as it becomes clear that the cargo will not be unloaded within the holding time, the master shall inform the nearest emergency services according to 1.4.1.2.

7.2.4.17 Closing of windows and doors - 7.2.4.17.1

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

This provision does not apply to:

- air intakes of running engines;
- ventilation inlets of engine rooms while the engines are running;

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

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

These entrances and openings may only be opened when necessary and for a short time, after the master has given his permission.

7.2.4.28 Water-spray system - 7.2.4.28.2

When water-spraying is required in column (9) of Table C of Chapter 3.2 and the pressure of the gaseous phase in the cargo tanks may reach 80% of the relief pressure of the pressure relief devices/high-velocity vent valves, the master shall take all measures compatible with safety to prevent the pressure from reaching that value. He shall in particular activate the water-spray system.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

The master onboard can take all measures compatible with safety to prevent the pressure from reaching that value. He can in particular activate the water-spray system.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

The master onboard can take all measures compatible with safety to prevent the pressure from reaching that value. He can in particular activate the water-spray system.

7.2.5.8 Reporting duty - 7.2.5.8.1

In the States where the reporting duty is in force, the master of the vessel shall provide information in accordance with paragraph 1.1.4.6.1.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

8.1.2 Documents - 8.1.2.2

In addition to the documents prescribed in 8.1.2.1, the following documents shall be carried on board dry cargo vessels:

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

- (a) The stowage plan prescribed in 7.1.4.11;
- (b) The ADN specialized knowledge certificate prescribed in 8.2.1.2;
- (c) For vessels complying with the additional requirements for double-hull vessels:
 - a damage-control plan;
 - the documents concerning intact stability as well as all conditions of intact stability taken into account for the damaged stability calculation in a form the master understands;
 - the certificate of the recognized classification society (see 9.1.0.88 or 9.2.0.88);
- (d) The inspection certificates concerning the fixed fire extinguishing systems prescribed in 9.1.0.40.2.9;
- (e) A list of or a general plan indicating the fixed installations and equipment suitable for use at least in zone 1 and the installations and equipment complying with 9.1.0.51;
- (f) A list of or a general plan indicating the fixed installations and equipment which are not authorized for use during loading and unloading, during a stay in the immediate vicinity of or within an onshore assigned zone (marked in red according to 9.1.0.52.2);

- (g) A plan indicating the boundaries of the zones and the location of the electrical and non-electrical equipment installed in the relevant zones intended for use in explosion hazardous areas;
- (h) A list of the installations and equipment referred to under (g) with the following information:
- Installation/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EU or equivalent protection level, explosion group, temperature class, type of protection, test body) in case of electrical equipment for use in zone 1 (alternatively, a copy of the certificate of conformity according to Directive 2014/34/EU¹);
 - Installation/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EU¹ or equivalent protection level, including explosion group and temperature class, type of protection, identification number) in case of electrical equipment for use in zone 2 and in the case of non-electrical equipment for use in zone 1 and zone 2 (alternatively, a copy of the certificate of conformity according to Directive 2014/34/EU¹);

The documents listed in paragraphs (e) to (h) shall bear the stamp of the competent authority issuing the certificate of approval.

8.1.2 Documents - 8.1.2.3

In addition to the documents prescribed in 8.1.2.1, the following documents shall be carried on board tank vessels:

- (a) The cargo stowage plan prescribed in 7.2.4.11.2;
- (b) The ADN specialized knowledge certificate prescribed in 8.2.1.2;
- (c) For vessels which have to conform to the conditions of damage-control (see 9.3.1.15, 9.3.2.15 or 9.3.3.15)
 - a damage-control plan;
 - the documents concerning intact stability as well as all conditions of intact stability taken into account for the damaged stability calculation in a form the master understands; the stability booklet and the proof of the loading instrument having been approved by the recognized classification society;
- (d) – (x)

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

| <i>European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)</i> (2023, Volume I) | <i>Phase 2</i> <i>Full Crew</i> | <i>Phase 3a</i> <i>Crew-reduction</i> |
|---|---|--|
| <p>8.1.2 Documents - 8.1.2.4</p> <p>The instructions in writing referred to in 5.4.3 shall be handed to the master before loading. They shall be kept readily at hand in the wheelhouse.</p> <p>On board dry cargo vessels, the transport documents shall be handed to the master before loading and on board tank vessels they shall be handed to him after loading and before the journey commences.</p> | <p>There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.</p> | <p>There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.</p> |
| <p>8.1.2 Documents - 8.1.2.8</p> <p>All documents shall be on board in a language the master is able to read and understand. If that language is not English, French or German, all documents, with the exception of the copy of ADN with its annexed Regulations and those for which the Regulations include special provisions concerning languages, shall be on board also in English, French or German, unless agreements concluded between the countries concerned in the transport operation provide otherwise.</p> | <p>There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.</p> | <p>There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.</p> |
| <p>8.6.3 ADN Checklist (page 469 – 473)</p> | <p>No difference between phase 2, where the full crew still remains onboard, and the conventional situation due to the fact that the responsible boat master still remains onboard.</p> | <p>There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.</p> |
| <p>8.6.4 Checklist degassing to reception facilities (page 474 – 477)</p> | <p>There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.</p> | <p>There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.</p> |

9.1.0.40 Fire-extinguishing arrangements - 9.1.0.40.2.5
In addition, the engine rooms shall be provided with a permanently fixed fire-extinguishing system meeting the following requirements:

Triggering device

- (a) Automatically activated fire-extinguishing systems are not permitted.
- (b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected.
- (c) Triggering devices shall be so installed that they can be activated also in the event of a fire, and that the required quantity of extinguishing agent can still be provided in the space to be protected in the event of a fire or of damage caused by a fire or an explosion.

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

When the triggering devices are so placed as not to be visible, the component concealing them shall carry the "Fire-fighting system" symbol, each side being not less

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

than 10 cm in length, with the following text in red letters on a white ground:

Fire-extinguishing system

- (d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space;
- (e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall be in a language the master can read and understand and if this language is not English, French or German, they shall be in English, French or German. They shall include information concerning:
 - (i) The activation of the fire-extinguishing system
 - (ii) the need to ensure that all persons have left the space to be protected;
 - (iii) The correct behaviour of the crew in the event of activation and when accessing the space to be protected following activation or diffusion, in particular in respect of the possible presence of dangerous substances;
 - (iv) the correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.

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

9.3.1.13 Stability (general) - 9.3.1.13.3

Proof of sufficient intact stability shall be furnished for all stages of loading and unloading and for the final loading condition for all the relative densities of the substances transported contained in the vessel substance list according to 1.16.1.2.5.

For every loading case, taking account of the actual fillings and floating position of cargo tanks, ballast tanks and compartments, drinking water and sewage tanks and tanks containing products for the operation of the vessel, the vessel shall comply with the intact and damage stability requirements.

Intermediate stages during operations shall also be taken into consideration.

The proof of sufficient stability shall be shown for every operating, loading and ballast condition in the stability booklet, to be approved by the recognized classification society, which classes the vessel. If it is unpractical to pre-calculate the operating, loading and ballast conditions, a loading instrument approved by the recognised classification society which classes the vessel shall be installed and used which contains the contents of the stability booklet.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (2023, Volume I)

*Phase 2
Full Crew*

*Phase 3a
Crew-reduction*

NOTE: *A stability booklet shall be worded in a form comprehensible for the responsible master and containing the following details:*

General description of the vessel:

- General arrangement and capacity plans indicating the assigned use of compartments and spaces (cargo tanks, stores, accommodation, etc.);*
- A sketch indicating the position of the draught marks referring to the vessel's perpendiculars;*
- A scheme for ballast/bilge pumping and overflow prevention systems;*
- Hydrostatic curves or tables corresponding to the design trim, and, if significant trim angles are foreseen during the normal operation of the vessel, curves or tables corresponding to such range of trim are to be introduced;*
- Cross curves or tables of stability calculated on a free trimming basis, for the ranges of displacement and trim anticipated in normal operating conditions, with an indication of the volumes which have been considered buoyant;*
- Tank sounding tables or curves showing capacities, centres of gravity, and free surface data for all cargo tanks, ballast tanks and compartments, drinking water*

*and sewage water tanks and tanks
containing products for the operation of
the vessel;*

- Lightship data (weight and centre of gravity) resulting from an inclining test or deadweight measurement in combination with a detailed mass balance or other acceptable measures. Where the above-mentioned information is derived from a sister vessel, the reference to this sister vessel shall be clearly indicated, and a copy of the approved inclining test report relevant to this sister vessel shall be included;*
- A copy of the approved test report shall be included in the stability booklet;*
- Operating loading conditions with all relevant details, such as:*
 - Lightship data, tank fillings, - Lightship data, tank fillings, stores, crew and other relevant items on board (mass and centre of gravity for each item, free surface moments for liquid loads);*
 - Draughts amidships and at perpendiculars;*
 - Metacentric height corrected for free surfaces effect;*
 - Righting lever values and curve;*

| <i>European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (2023, Volume I)</i> | <i>Phase 2 Full Crew</i> | <i>Phase 3a Crew-reduction</i> |
|---|------------------------------|------------------------------------|
|---|------------------------------|------------------------------------|

- *Longitudinal bending moments and shear forces at read-out points;*

- *Information about openings (location, type of tightness, means of closure); and*

- *Information for the master.*

- *Calculation of the influence of ballast water on stability with information on whether fixed level gauges for ballast tanks and compartments have to be installed or the ballast tanks, or compartments shall only be completely full or completely empty when underway.*

9.3.1.17 Accommodation and service space - 9.3.1.17.3 Entrances from the deck and openings of spaces facing the weather shall be capable of being closed. The following instruction shall be displayed at the entrance of such spaces:

Do not open during loading, unloading and degassing without the permission of the master.

Close immediately.

9.3.1.17 Accommodation and service space - 9.3.1.17.7 The following instruction shall be displayed at the entrance of the cargo pump-room:

Before entering the cargo pump-room check whether it is free from gases and contains sufficient

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

**oxygen. Do not open doors and entrance openings
without the permission of the master.**

Leave immediately in the event of alarm.

9.3.1.40. Fire-extinguishing arrangements - 9.3.1.40.2.5
In addition the engine rooms, the cargo pump-room and
all spaces containing special equipment (switchboards,
compressors, etc.) for the refrigerant equipment if any,
shall be provided with a permanently fixed fire-
extinguishing system meeting the following
requirements:

Triggering device

- (a) Automatically activated fire-extinguishing systems are not permitted.
- (b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected.
- (c) Triggering devices shall be so installed that they can be activated also in the event of a fire, and that the required quantity of extinguishing agent can still be provided in the space to be protected in the event of a fire or of damage caused by a fire or an explosion.

Systems which are not mechanically activated shall be supplied from two energy sources independent of each other. These energy sources shall be located outside the space to be protected. The control lines

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

located in the space to be protected shall be so designed as to remain capable of operating in the event of a fire for a minimum of 30 minutes. The electrical installations are deemed to meet this requirement if they conform to the IEC 60331–21:1999 standard.

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

Fire-extinguishing system

- (d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space;
- (e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall be in a language the master can read and understand and if this language is not English, French or German, they shall be in English, French or German. They shall include information concerning:
 - (i) The activation of the fire-extinguishing system
 - (ii) The need to ensure that all persons have left the space to be protected;

- (iii) The correct behaviour of the crew in the event of activation and when accessing the space to be protected following activation or diffusion, in particular in respect of the possible presence of dangerous substances;
- (iv) The correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.
- (f) The instructions shall mention that prior to the activation of the fire-extinguishing system, combustion engines installed in the space and aspirating air from the space to be protected, shall be shut down.

9.3.2.13 Stability (general) - 9.3.2.13.3

Proof of sufficient intact stability shall be furnished for all stages of loading and unloading and for the final loading condition for all the relative densities of the substances transported contained in the vessel substance list according to 1.16.1.2.5.

For every loading case, taking account of the actual fillings and floating position of cargo tanks, ballast tanks and compartments, drinking water and sewage tanks and tanks containing products for the operation of the vessel, the vessel shall comply with the intact and damage stability requirements.

Intermediate stages during operations shall also be taken into consideration.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)
(2023, Volume I)

Phase 2
Full Crew

Phase 3a
Crew-reduction

The proof of sufficient stability shall be shown for every operating, loading and ballast condition in the stability booklet, to be approved by the recognized classification society, which classes the vessel. If it is unpractical to pre-calculate the operating, loading and ballast conditions, a loading instrument approved by the recognised classification society which classes the vessel shall be installed and used which contains the contents of the stability booklet.

NOTE: *A stability booklet shall be worded in a form comprehensible for the responsible master and containing the following details:*

General description of the vessel:

- *General arrangement and capacity plans indicating the assigned use of compartments and spaces (cargo tanks, stores, accommodation, etc.);*
- *A sketch indicating the position of the draught marks referring to the vessel's perpendiculars;*
- *A scheme for ballast/bilge pumping and overflow prevention systems;*
- *Hydrostatic curves or tables corresponding to the design trim, and, if significant trim angles are foreseen during the normal operation of the vessel, curves or tables corresponding to such range of trim are to be introduced;*
- *Cross curves or tables of stability calculated on a free trimming basis, for the*

ranges of displacement and trim anticipated in normal operating conditions, with an indication of the volumes which have been considered buoyant;

- Tank sounding tables or curves showing capacities, centres of gravity, and free surface data for all cargo tanks, ballast tanks and compartments, drinking water and sewage water tanks and tanks containing products for the operation of the vessel;*
- Lightship data (weight and centre of gravity) resulting from an inclining test or deadweight measurement in combination with a detailed mass balance or other acceptable measures. Where the above-mentioned information is derived from a sister vessel, the reference to this sister vessel shall be clearly indicated, and a copy of the approved inclining test report relevant to this sister vessel shall be included;*
- A copy of the approved test report shall be included in the stability booklet;*
- Operating loading conditions with all relevant details, such as:*
 - Lightship data, tank fillings, stores, crew and other relevant items on board (mass and centre of gravity for each item, free surface moments for liquid loads);*

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (2023, Volume I)

*Phase 2
Full Crew*

*Phase 3a
Crew-reduction*

- *Draughts amidships and at perpendiculars;*
 - *Metacentric height corrected for free surfaces effect;*
 - *Righting lever values and curve;*
 - *Longitudinal bending moments and shear forces at read-out points;*
 - *Information about openings (location, type of tightness, means of closure); and*
 - *Information for the master.*
- *Calculation of the influence of ballast water on stability with information on whether fixed level gauges for ballast tanks and compartments have to be installed or the ballast tanks, or compartments shall only be completely full or completely empty when underway.*

9.3.2.17 Accommodation and service spaces -9.3.2.17.3 Entrances from the deck and openings of spaces facing the weather shall be capable of being closed. The following instruction shall be displayed at the entrance of such spaces:

Do not open during loading, unloading and degassing without the permission of the master.

Close immediately.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

9.3.2.17 Accommodation and service spaces -
9.3.2.17.7

The following instruction shall be displayed at the entrance of the cargo pump-room:

Before entering the cargo pump-room check whether it is free from gases and contains sufficient oxygen. Do not open doors and entrance openings without the permission of the master.

Leave immediately in the event of alarm.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

9.3.2.40 Fire-extinguishing arrangements 9.3.2.40.2.5

In addition the engine rooms, the cargo pump-room and all spaces containing special equipment (switchboards, compressors, etc.) for the refrigerant equipment if any, shall be provided with a permanently fixed fire-extinguishing system meeting the following requirements:

Triggering device

- (a) Automatically activated fire-extinguishing systems are not permitted.
- (b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected.
- (c) Triggering devices shall be so installed that they can be activated also in the event of a fire, and that the required quantity of extinguishing agent can still be provided in

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

the space to be protected in the event of a fire or of damage caused by a fire or an explosion.

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

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

Fire-extinguishing system

- (d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space;
- (e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall be in a language the master can read and understand and if this language is not English, French or

German, they shall be in English, French or German. They shall include information concerning:

- (i) The activation of the fire-extinguishing system
 - (ii) The need to ensure that all persons have left the space to be protected;
 - (iii) The correct behaviour of the crew in the event of activation and when accessing the space to be protected following activation or diffusion, in particular in respect of the possible presence of dangerous substances;
 - (iv) The correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.
- (f) The instructions shall mention that prior to the activation of the fire-extinguishing system, combustion engines installed in the space and aspirating air from the space to be protected, shall be shut down.

9.3.3.13 Stability (general) - 9.3.3.13.3

Proof of sufficient intact stability shall be furnished for all stages of loading and unloading and for the final loading condition for all the relative densities of the substances transported contained in the vessel substance list according to 1.16.1.2.5.

There is no difference between phase 2, where the full crew remains onboard, and the conventional situation because the responsible boat master remains onboard.

There is no difference between phase 3a, where there is a reduced crew onboard, and the conventional situation because the responsible boat master still remains onboard.

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (2023, Volume I)

*Phase 2
Full Crew*

*Phase 3a
Crew-reduction*

For every loading case, taking account of the actual fillings and floating position of cargo tanks, ballast tanks and compartments, drinking water and sewage tanks and tanks containing products for the operation of the vessel, the vessel shall comply with the intact and damage stability requirements.

Intermediate stages during operations shall also be taken into consideration.

The proof of sufficient stability shall be shown for every operating, loading and ballast condition in the stability booklet, to be approved by the recognized classification society, which classes the vessel. If it is unpractical to pre-calculate the operating, loading and ballast conditions, a loading instrument approved by the recognised classification society which classes the vessel shall be installed and used which contains the contents of the stability booklet.

NOTE: *A stability booklet shall be worded in a form comprehensible for the responsible master and containing the following details:*

General description of the vessel:

- *General arrangement and capacity plans indicating the assigned use of compartments and spaces (cargo tanks, stores, accommodation, etc.);*
- *A sketch indicating the position of the draught marks referring to the vessel's perpendiculars;*
- *A scheme for ballast/bilge pumping and overflow prevention systems;*

- *Hydrostatic curves or tables corresponding to the design trim, and, if significant trim angles are foreseen during the normal operation of the vessel, curves or tables corresponding to such range of trim are to be introduced;*
- *Cross curves or tables of stability calculated on a free trimming basis, for the ranges of displacement and trim anticipated in normal operating conditions, with an indication of the volumes which have been considered buoyant;*
- Tank *sounding* tables or curves showing capacities, centres of gravity, and free surface data for all cargo tanks, ballast tanks and compartments, drinking water and sewage water tanks and tanks containing products for the operation of the vessel;
- Lightship data (weight and centre of gravity) resulting from an inclining test or deadweight measurement in combination with a detailed mass balance or other acceptable measures. Where the above-mentioned information is derived from a sister vessel, the reference to this sister vessel shall be clearly indicated, and a copy of the approved inclining test report relevant to this sister vessel shall be included;

- A copy of the approved test report shall be included in the stability booklet;
- Operating loading conditions with all relevant details, such as:
 - *Lightship data, tank fillings, stores, crew and other relevant items on board (mass and centre of gravity for each item, free surface moments for liquid loads);*
 - *Draughts amidships and at perpendiculars;*
 - *Metacentric height corrected for free surfaces effect;*
 - *Righting lever values and curve;*
 - *Longitudinal bending moments and shear forces at read-out points;*
 - *Information about openings (location, type of tightness, means of closure); and*
 - *Information for the master.*
- Calculation of the influence of ballast water on stability with information on whether fixed level gauges for ballast tanks and compartments have to be installed or the ballast tanks, or compartments shall only be completely full or completely empty when underway.

9.3.3.17 Accommodation and service spaces -9.3.3.17.3
Entrances from the deck and openings of spaces facing
the weather shall be capable of being closed. The
following instruction shall be displayed at the entrance
of such spaces:

**Do not open during loading, unloading and
degassing without the permission of the master.**

Close immediately.

9.3.3.17 Accommodation and service spaces -
9.3.3.17.7

The following instruction shall be displayed at the
entrance of the cargo pump-room:

**Before entering the cargo pump-room check
whether it is free from gases and contains sufficient
oxygen. Do not open doors and entrance openings
without the permission of the master.**

Leave immediately in the event of alarm.

9.3.3.40 Fire-extinguishing arrangements 9.3.3.40.2.5
In addition the engine rooms, the cargo pump-room and
all spaces containing special equipment (switchboards,
compressors, etc.) for the refrigerant equipment if any,
shall be provided with a permanently fixed fire-
extinguishing system meeting the following
requirements:

There is no difference between phase 2, where the
full crew remains onboard, and the conventional
situation because the responsible boat master
remains onboard.

There is no difference between phase 2, where the
full crew remains onboard, and the conventional
situation because the responsible boat master
remains onboard.

There is no difference between phase 2, where the
full crew remains onboard, and the conventional
situation because the responsible boat master
remains onboard.

There is no difference between phase 3a, where there is a
reduced crew onboard, and the conventional situation
because the responsible boat master still remains onboard.

There is no difference between phase 3a, where there is a
reduced crew onboard, and the conventional situation
because the responsible boat master still remains onboard.

There is no difference between phase 3a, where there is a
reduced crew onboard, and the conventional situation
because the responsible boat master still remains onboard.

Triggering device

- (a) Automatically activated fire-extinguishing systems are not permitted.
- (b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected.
- (c) Triggering devices shall be so installed that they can be activated also in the event of a fire, and that the required quantity of extinguishing agent can still be provided in the space to be protected in the event of a fire or of damage caused by a fire or an explosion.

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

When the triggering devices are so placed as not to be visible, the component concealing them shall carry the "Fire-fighting system" symbol, each side being not less than 10 cm

in length, with the following text in red
letters on a white ground:

Fire-extinguishing system

- (d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space;
 - (e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall be in a language the master can read and understand and if this language is not English, French or German, they shall be in English, French or German. They shall include information concerning:
 - (i) The activation of the fire-extinguishing system
 - (ii) The need to ensure that all persons have left the space to be protected;
 - (iii) The correct behaviour of the crew in the event of activation and when accessing the space to be protected following activation or diffusion, in particular in respect of the possible presence of dangerous substances;
 - (iv) The correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.
-

*European Agreement concerning the International Carriage of
Dangerous Goods by Inland Waterways (ADN)
(2023, Volume I)*

*Phase 2
Full Crew*

*Phase 3a
Crew-reduction*

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