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## Economic Commission for Europe

### Inland Transport Committee

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

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

#### Twentieth session

Geneva, 23–27 January 2012

Item 4 (b) of the provisional agenda

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

### **Safeguarding the stability of tank vessels carrying dangerous goods<sup>1, 2</sup>**

**Transmitted by the German Government**

#### **I. Background**

1. During the eighteenth session of the Safety Committee, the German delegation reported on the accident involving the "Waldhof" tank vessel, which was carrying sulphuric acid, on the Rhine on 13 January 2011.
2. During the nineteenth session of the Safety Committee, the Central Commission for the Navigation of the Rhine (CCNR) provided information about its activities with regard to the safety and reliability of the Rhine as an inland waterway.
3. Germany as the country in which the accident occurred and the authorities of which were responsible for handling the accident has hosted a total of three working meetings (in April, June/July and October 2011) for informal discussions on the potential need to amend the Regulations annexed to ADN as well as the urgency of responses and measures. These meetings were attended by up to 40 representatives of Contracting Parties, the European Commission, the inland navigation industry, recommended classification societies, training providers, the chemical industry, CCNR and other expert bodies. The sole competence of

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<sup>1</sup> Distributed in German by the Central Commission for the Navigation of the Rhine under the symbol CCNR/ZKR/ADN/WP.15/AC.2/2012/14.

<sup>2</sup> In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106, ECE/TRANS/2010/8, programme activity 02.7 (b)).

the Safety Committee for amendments to the Regulations annexed to the ADN was stressed at all times.

4. In the framework of the European Union, immediate measures according to Article 5 of Directive No. 2008/68 EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods were not considered necessary. The stability requirements contained in the regulations proved to be basically sufficient. However, there is a need for improvements in various items regarding the comprehension, enforceability and practical implementation of these requirements. Areas were identified where amendments to the Regulations annexed to the ADN should be made without delay:

- (a) Stability as a matter of training for masters and ADN experts;
- (b) Importance and handling of the so-called "substance list" issued by the classification societies;
- (c) Contents, form and usability of the stability documents prepared for tank vessels.

5. During the third working meeting organized by Germany on 4 and 5 October 2011 detailed proposals for amendments were formulated and discussed, referring expressly only to transport by tank vessels. These informally prepared proposals are now submitted to the Safety Committee for further discussion and possible adoption.

## II. Proposals for amendments and explanations

6. The German delegation thanks all participants of the three working meetings for their qualified and committed cooperation and submits the following draft amendments to the Regulations annexed to ADN for entry into force as of 1 January 2013.

7. Text which is no longer applicable is struck through and new or modified text is underlined if it supplements existing text. Each proposed amendment is followed by an explanation.

### A. Amendments concerning the expertise of the responsible master

#### 1. Qualification of the vessel's crew

- (a) Amend 7.2.3.15 as follows:

**"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 ~~on board~~ according to 8.2.1.2. In addition ~~this expert~~ he shall be:

- An expert as referred to in 8.2.1.[x] when dangerous substances are carried for which a type N tank vessel (cargo tank walls distinct from vessel hull) is prescribed in columns (6) and (8) of Table C of Chapter 3.2,
- An expert as referred to in 8.2.1.5 when dangerous substances 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 substances are carried for which a type C tank vessel is prescribed in column (6) of Table C of Chapter 3.2.

NOTE: Which member of the vessel's crew is the responsible master has to be determined and documented [on board] by the transport operator. If there is no such determination, the requirement applies to every master.

In deviation from this, for the transport of dangerous goods in tank lighters, it is sufficient that the person who is responsible for loading and unloading and for ballasting of the tank lighter has the expertise required according to 8.2.1.2, 8.2.1.5 or 8.2.1.7"

(The second paragraph remains unchanged).

Explanation: The qualification requirements for masters responsible also for loading of the vessel have taken stability aspects into account to a very limited extent to date. The ADN is the Regulation with the most detailed training requirements which can be used as a basis in the short term.

Knowledge about the properties of the products to be carried, loading processes and stability requirements for inland tank vessels should be systematically combined in the person of the master.

Restriction of training to a master "with primary responsibility" is considered to be a small, however sufficient measure, but it should and can be complemented by measures taken by carriers/employers regarding replacement arrangements and the delegation of tasks on board.

(b) Insert a new transitional measure 1.6.1.X

"The provisions regarding the expert on board according to 7.2.3.15 may be applied until 31 December 2014 in the version applicable on 31 December 2012. The master with primary responsibility or the person responsible for a lighter who on 1 January 2015 has an expert certificate valid beyond this date according to the version applicable on 31 December 2012 remains, until the expiry of the validity of the certificate, exempt from the "stability" part of the course according to 8.2.1.[x]."

Explanation: A reasonable transitional period for retraining the existing vessel's crew shall be considered (e.g. extension of times of absence on board). A transitional period also enables the competent authorities of Contracting Parties to adapt to the adjustments of training courses and subsequent examinations.

## 2. Requirements on the training of experts

\*) Unchanged:

"8.2.1.3 The experts referred to in 8.2.1.2 shall take part in a basic training course. ...".

(a) Insert the following new text after 8.2.1.3:

"Experts for the transport of substances in type N vessels (cargo tank walls distinct from vessel hull) shall take part in a specialization course on stability which covers at least the objectives mentioned in 8.2.2.3.3.3. Training shall be given in the form of a course approved by the competent authority.<sup>3</sup>"

Explanation: Special requirements apply to the stability of all double-hull vessels. Therefore, a special qualification shall be introduced for persons who are already experts and masters on board type N double-hull vessels (cargo tank walls distinct from vessel hull)

<sup>3</sup> Then, however, a differentiation would also have to be made in the expert certificate.

in addition to the general tank vessel (type N) training course. This qualification shall exclusively contain additional knowledge on stability in a new advanced training course applicable to all types of vessels (N - double-hull, G and C). It is not possible to integrate the additional training contents on stability matters for tank vessels in the present, very compact tank vessel part of the course, which is also limited in time. Hence, a separate specialized training course is required for training on these issues.

- (b) Amend 8.2.1.4 as follows:

"8.2.1.4 After five years the expert shall furnish proof, in the form of relevant particulars entered in the certificate by the competent authority or by a body recognised by it, of participation in a refresher course taken in the last year prior to the expiry of the certificate, covering at least the objectives referred to in 8.2.2.3.1.1 and in 8.2.2.3.1.2 or 8.2.2.3.1.3 and comprising current new developments in particular. For experts on the carriage of substances in type N vessels (cargo tank walls distinct from vessel hull) the examination objectives referred to in 8.2.2.3.3.3 shall additionally be covered. The new period of validity shall begin on the expiry date of the certificate; in other cases it shall begin on the date of the certificate of participation in the course."

Explanation: Refresher courses shall also serve to refresh specialized knowledge on stability at regular intervals to ensure that the qualification of experts is always maintained.

- (c) Amend 8.2.1.5 as follows:

"8.2.1.5 "Experts for the carriage of gases shall take part in a specialization course covering at least the objectives referred to in 8.2.2.3.3.1 and in an advanced refresher training course on stability covering at least the examination objectives referred to in 8.2.2.3.3.3. The training shall be given in the context of ~~classes~~ courses approved by the competent authority. An expert certificate shall be issued to persons who, after training, have successfully passed ~~an examination concerning the carriage of gases~~ examinations for the advanced training courses on gases and stability and have produced evidence of not less than one year's work on board a type G vessel during a period of two years prior to or following the examination."

Explanation: Special stability requirements apply to all double-hull vessels, in particular to type G vessels. Therefore, for working on such vessels specialized knowledge needs to be imparted as early as during the initial advanced training. The additional training contents on stability matters for inland tank vessels cannot be integrated into the present, very compact parts of the specialization course on gases, which are limited in time. Hence, a separate advanced training course is required to this end.

- (d) Amend 8.2.1.6 as follows:

In the first indent, insert "successfully" after "participated" and "and 8.2.2.3.3.3" after "in 8.2.2.3.3.1".

Explanation: Refresher courses will also serve to refresh specialized knowledge on stability at regular intervals to ensure that the qualification of experts is always maintained. It could be discussed whether comparable knowledge could be systematically imparted during "work on board".

- (e) Amend 8.2.1.7 as follows:

"8.2.1.7 Experts for the carriage of chemicals shall take part in a specialization course covering at least the objectives referred to in 8.2.2.3.3.2 and in an advanced refresher training course on stability covering at least the examination objectives referred to in 8.2.2.3.3.3. The training shall be given in the context of ~~classes~~ courses approved by the competent authority A certificate shall be issued to persons,

who, after training, have successfully passed ~~an examination concerning the carriage of chemicals~~ examinations for the advanced training courses on chemicals and stability and have produced evidence of not less than one year's work on board a type C vessel during a period of two years prior to or following the examination."

Explanation: Special stability requirements apply to all double-hull vessels, in particular to type C vessels. Therefore, for working on such vessels specialized knowledge needs to be imparted as early as during the initial advanced training. The additional training contents on stability matters for inland tank vessels cannot be integrated into the present, very compact parts of the specialization course on chemicals, which are limited in time. Hence, a separate advanced training course is required to this end.

(f) Amend 8.2.1.8 as follows:

In the first indent, insert "successfully" after "participated" and "and 8.2.2.3.3" after "in 8.2.2.3.2".

Explanation: Refresher courses will also serve to refresh specialized knowledge on stability at regular intervals to ensure that the qualification of the expert is always maintained. It could be discussed whether comparable knowledge could be systematically imparted during "work on board".

(g) Add new text at the end of 8.2.2.3.3 to read as follows:

*"Specialization course on stability*

Prior training:	[Basic course for the carriage in tank vessels or combination of carriage of dry goods and carriage in tank vessels] [valid ADN "tank vessels" or combination "dry cargo vessels/tank vessels" certificate]
Knowledge:	[.....]
Authorized for:	Qualification for tank vessels for the transport of substances for which a type N tank vessel (cargo tank walls distinct from vessel hull), a type C or a type G vessel is required
Training:	[.....]"

Explanation: For the newly integrated advanced training course on stability, training contents, participation requirements and the authorization resulting from participation need to be determined to ensure uniform and comparable conditions for all Contracting Parties. The informal working group on the catalogue of questions is requested to contribute a suitable text for "Knowledge" and "Training" in an informal document.

(h) Add a new paragraph 8.2.2.3.3.3 as follows:

"The specialization course on stability shall cover at least the following subjects:

- parameters of relevance to stability
- heeling moments
- exemplary calculations
- damage stability, intermediate states and final state of flooding
- influence of free surfaces
- evaluation of stability on the basis of existing stability criteria (text of Regulations)
- evaluation of intact stability with the help of the lever arm curve

- application of loading computers
- use of loading computer systems".

Explanation: Examination objectives need to be formulated for the newly integrated specialization course on stability to achieve the desired training level and ensure uniform and comparable conditions for all Contracting Parties.

- (i) Amend 8.2.2.3.4 as follows:

*"Refresher and advanced training courses on gases*

....

"Training: gases 8.2.2.3.3.1 and stability 8.2.2.3.3.3"

*"Refresher and advanced training courses on chemicals*

....

"Training: chemicals 8.2.2.3.3.2 and stability 8.2.2.3.3.3"

Explanation: The preconditions for participation in the refresher courses need to be adjusted to the extension of the initial training courses.

- (j) Amend 8.2.2.4 as follows:

*"The following minimum periods of training shall be observed:*

...

"Specialization course on stability 8 lessons of 45 minutes each"

Explanation: Like all other types of courses the time periods of lessons also need to be fixed for the new specialization course on stability. Since a certain basic level of understanding of masters regarding shipbuilding and operation can be assumed, a one-day training course on connections with the cargo containing dangerous goods and proper operations would seem to be sufficient.

- (k) Amend 8.2.2.5 as follows:

"...

"The following minimum periods of training shall be observed:

...

Specialization refresher course on gases 10 lessons of 45 minutes each.

Specialization refresher course on chemicals 10 lessons of 45 minutes.

Each day of training may comprise no more than eight lessons and in the case of specialization courses no more than 10 lessons."

Explanation: For refreshing the knowledge for the specialization course on stability two lessons would seem to be sufficient. A separate refresher course is not justified. Therefore, the established refresher courses should be extended by two lessons given the necessary extension of the curriculum.

- (l) Insert a new paragraph 8.2.2.7.3 to read as follows:

"8.2.2.7.3 Specialization course on stability

8.2.2.7.3.1 Candidates having [successfully passed the examination for the ADN basic course] [participated in a basic course on tank vessels or in a combination course] may apply for enrolment in a specialization course on stability, to be

followed by an examination. The examination shall [be combined with the examination for the specialization courses on gases or chemicals in organizational terms and] be based on the Administrative Committee's catalogue of questions.\*

\*Note by the secretariat: The catalogue of questions and the additional guidance for its application are available on the website of the secretariat of the United Nations Economic Commission for Europe (<http://www.unece.org/trans/danger/danger.htm>).

8.2.2.7.3.2 During the examination the candidate shall furnish proof that, in accordance with the specialization course, he has the knowledge, understanding and capabilities required of the expert on board vessels in order to ensure sufficient stability of the vessel during its loading and operation.

8.2.2.7.3.3 For this purpose the Administrative Committee shall prepare a catalogue of questions comprising the examination objectives set out in 8.2.2.3.3.3. Questions in the examination shall be drawn from this list. The candidates shall not have any knowledge of the questions selected from the list prior to the examination.

8.2.2.7.3.4 The examination shall be written. The candidates shall be asked 10 multiple-choice questions and one substantive question. The examination shall last a total of 30 minutes.

8.2.2.7.3.5 The examination shall be marked out of a total of 15, of which 10 marks will go to the multiple-choice questions (one mark per question) and 5 marks to the substantive question. The candidate shall pass the examination successfully if he obtains at least 7 marks for the multiple-choice questions, at least 3 marks for the substantive question and in total at least 10 marks.

8.2.2.7.3.6 The texts of regulations and technical literature are permitted as reference during the examination."

Explanation: To ensure the attentive participation in the specialization course on stability, it shall be followed by a short examination. Basically, the same requirements shall apply to this examination as for the specialized training courses on gases and chemicals. However, they will be adjusted to the shorter training scope. Given the reduced scope of the examination objectives, a matrix is not required. Regarding the examination period, it is calculated that 2 minutes are required for answering one question as with the other specialization courses.

(m) Amend 8.6.2 Certificate of special knowledge of ADN according to 8.2.1.3, 8.2.1.5 or 8.2.1.7

Amend the title to read as follows:

"8.6.2 Certificate of special knowledge of ADN according to 8.1.2.x, 8.2.1.3, 8.2.1.5 or 8.2.1.7"

Amend the rear side of the certificate to read as follows:

"The holder of this certificate has special knowledge of ADN.

This certificate is valid for special knowledge of ADN according to:

8.2.1.3 (dry cargo vessels)\*

8.2.1.3 (type N single-hull tank vessels)

8.2.1.X (type N tank vessels (cargo tank walls distinct from vessel hull))\*

8.2.1.5\*

8.2.1.7\*"

Explanation: The certificate of knowledge also needs to show the newly introduced special knowledge of double-hull vessels, if acquired.

**B. Amendments regarding the "substance list" supplementing the certificate of approval**

(a) Amend 1.16.1.2.5 as follows:

"For tank vessels, the certificate of approval shall be supplemented by a list of all the dangerous goods accepted for carriage in the tank vessel, drawn up by the recognized classification society which has classified the vessel (vessel substance list). To the extent required for safe carriage, the list shall contain additional provisions for certain dangerous goods regarding:

- the criteria for strength and stability of the vessel or;
- the compatibility of the accepted dangerous goods with all the construction materials of the vessel, including installations and equipment, which come into contact with the cargo.

The entire vessel substance list shall be withdrawn by the recognized classification society within the period referred to in 1.6.1.1 if, due to amendments to these Regulations or due to changes in classification, goods contained in it are no longer permitted to be carried in the vessel.

The recognized classification society shall without delay transmit a copy of the vessel substance list to the authority responsible for issuing the certificate of approval and without delay inform it about amendments or withdrawal."

Explanation: Existing formulations may lead to different interpretations of the legal and real significance of the substance list. This could result in an inadequate appreciation of this document although it also contains important information and restrictions for safeguarding the stability of the vessel regarding specific products carried with a relative density deviating from the details in the certificate of approval.

The replacement of "zugestellt" by "erstellt" applies to the German wording and is an adjustment to the French and English versions.

Regarding its title a clear distinction is made between the "substance lists" of Table A and the "vessel substance list".

It was found that throughout the Regulations the terms "substances" and "goods" in English, and "marchandises dangereuses" and "matières dangereuses" in French, were used without distinction.

The content and the significance of the vessel substance list are described in more detail. It is made clear that all parties involved in the carriage can rely on the fact that the vessel is really suited for all the substances (products) listed, given both the technical specifications of the tank vessel (see also 9.3.x.0.1) and the current applicable provisions in the Regulations annexed to ADN. Due to possibility of the withdrawal of the vessel substance list, the owner is encouraged to take responsibility for the classification society making the necessary updates.

The competent authority for approving the vessel always has full knowledge of the vessel to be retrieved, for instance in the case of an accident.



"Copy" implies that it is not just a mere photocopy but a signed or certified duplicate with the character of a legal document.

(b) Note: The meetings of recommended ADN classification societies could discuss the question of whether the vessel substance list could or should also exist in electronic form. However, it must be ensured that the list is available on the vessel, for instance, in case of a power failure.

(c) Amend 1.16.15.2 as follows:

"The competent authorities shall keep copies of all the certificates which they have issued, as well as of the associated vessel substance lists of the recognised classification societies and of all amendments, withdrawals, new issuances and declarations of annulment of these documents and enter all particulars and amendments in them, as well as cancellations and replacements of certificates."

**Explanation:** The competent authority for granting approval of the vessel shall always have current information about the vessel.

(d) Amend the Note after 7.2.2.0.1 to read as follows:

*"NOTE: The substances accepted for carriage in the individual vessel are named in the vessel substance list to be drawn up by the recognised classification society (see 1.16.1.2.5)."*

**Explanation:** It is made clear that the vessel substance list is of a constitutive character and determines in combination with the certificate of approval issued by the competent authority which substances (products) may be transported on the specific vessel.

(e) Amend 8.1.2.3 as follows:

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

(a)-(b) (unchanged)

(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 permission of the loading computer system;

(d)-(f) (unchanged)

(g) the vessel substance list prescribed in 1.16.1.2.5

(h)-(o) (unchanged)"

**Explanation:** Adoption of the titles of newly introduced documents. The comprehensible form and the contents of the stability documents are included in the explanation in part 9 of the "Stability booklet".

(f) Amend item 15 in 8.6.1.3 Model for a certificate of approval for tank vessels as follows:

"15. The vessel is approved for the carriage of the dangerous goods entered in the vessel substance list according to 1.16.1.2.5 based on

- inspection on <sup>1)</sup> (date).....

- The inspection report of a recognized classification society<sup>1)</sup> (name of the classification society<sup>1)</sup> ..... (date).....
- The inspection report of the recognized inspection body (name of inspection body) ..... (date)....."

Explanation: As has been made clear already in the wording of the Regulations, the vessel substance list is of a constitutive character and determines in combination with the certificate of approval issued by the competent authority which substances (products) are allowed to be carried by a specific vessel.

Apart from the competent authority and the recognized classification societies, chapter 1.16 of the ADN (Procedure for the issue of the certificate of approval) now also determines the activities of special "inspection bodies". This option must also be reflected in the model certificate of approval.

- (g) Amend 9.3.X.0.1 (b) as follows:

"(b) Every part of the vessel including any installation and equipment which may come into contact with the cargo shall consist of materials which can neither be dangerously affected by the cargo nor cause decomposition of the cargo or react with it so as to form harmful or hazardous products. In case it has not been possible to examine this during classification and inspection of the vessel a relevant reservation shall be entered in the vessel substance list according to 1.16.1.2.5."

Explanation: Since the vessel substance list contains specific details as to which substances are allowed to be carried by the relevant vessel, it shall also expressly reflect compliance with the requirements for construction materials. A legal basis is established for the present practice of reservations.

- (h) Amend 9.3.X.8.1 as follows:

Third paragraph

"The classification society shall issue a certificate certifying that the vessel is in conformity with the rules of this section (classification certificate)."

Sixth paragraph

"The classification society shall draw up a vessel substance list mentioning all the dangerous goods accepted for carriage by the tank vessel (see also 1.16.1.2.5)."

Explanation: The titles of documents to be issued by classification societies to date were not clear. Apart from the classification certificate an inspection report in accordance with 1.16.3.1 also needs to be drawn up.

## C. Requirements regarding the stability of tank vessels

### 1. Handling of ballast water

- (a) Amend 7.2.3.20.1 as follows:

"Cofferdams and hold spaces containing insulated cargo tanks shall not be filled with water. Double-hull spaces, double bottoms and hold spaces which do not contain insulated cargo tanks may be filled with ballast water provided ~~the cargo tanks have been discharged.~~

- this has been taken into account in the intact and damage stability calculations, and  
~~[ the ballast tanks are not filled to more than 90 % of their capacity]~~
- the filling is not prohibited in column (20) of Table C of Chapter 3.2.

If the water in the ballast tanks could jeopardize the stability of the vessel:

- (a) fixed level indicators shall be installed; or
- (b) the filling level of the ballast tanks shall be checked daily before departure and during operations.

In case of the existence of level indicators, ballast tanks may also be partially filled. Otherwise they shall be completely full or empty."

Explanation: It has also been realized that the handling of ballast water may impair the stability of a double-hull vessel. Free surfaces in the ballast tanks may increase the detrimental effects, in particular in situations where there are also free surfaces in the cargo tanks. This fact deserves a great deal more attention and, therefore, needs to be expressly mentioned in the Regulations.

An inspection carried out by the classification society can establish whether the stability of an individual vessel is likely to be impaired. The vessel's crew is only able to reasonably respond if the exact filling levels are known.

The German delegation could not find any explanation for the requirement that the filling level of the ballast tanks must not exceed 90%. Deletion of this requirement could be discussed.

b) Add a new entry in the table in 1.6.7.2.2.2 to read as follows:

"7.2.3.20.1	Level indicators for ballast tanks	N.R.M. For Type C and G tank vessels Renewal of the certificate of approval as from 1 January 2013"
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Explanation: The installation of level indicators may involve technical problems on vessels operated without any further modifications (e.g. accessibility of ballast tanks, cable routing). Installations of level indicators should not be required during running operations but on the occasion of a comprehensive re-inspection of the vessels.

## 2. Degree of filling for deviating densities of substances

(a) Amend 7.2.4.21.1 as follows:

"The degree of filling given in column (11) of Table C of Chapter 3.2 or calculated in accordance with 7.2.4.21.3 for the individual cargo tank shall not be exceeded."

Explanation: The present wording permits different interpretations, e.g. that the degree of filling refers to the total cargo tank volume. However, column (11) of Table C expressly refers to the individual tank.

(b) Amend 7.2.4.21.3 as follows:

"For carriage of substances having a relative density higher than that stated in the certificate of approval, the maximum permissible degree of filling of the cargo tanks shall be calculated in accordance with the following formula:

$$\text{maximum permissible degree of filling (\%)} = a * 100/b$$

a = relative density stated in the certificate of approval,

b = relative density of the substance.

The degree of filling given in column (11) of Table C of Chapter 3.2 shall, however, not be exceeded.

**NOTE:** Furthermore, the requirements concerning stability, longitudinal strength and the deepest sinkage of the vessel shall be observed when filling the cargo tanks."

**Explanation:** This wording makes it clear that the conversion formula refers to a lower degree of filling of the individual tank than that indicated in Table C, column (11), and to the transverse strength of the cargo tanks underlying the details in the certificate of approval. The additional considerations to be included are highlighted again.

### **3. Proof of intact stability**

(a) Amend 9.3.X.13.3 as follows:

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

For every loading case, taking account of the actual tank fillings and trims, the vessel shall comply with the intact and damage stability requirements to the extent necessary.

Interim stages during operations shall also be taken into consideration.

The stability documents with this proof and the loading cases approved by the recognised classification society which classified the vessel shall be compiled in a stability booklet. If not all loading cases have been concretely taken into consideration, a loading computer approved by the recognised classification society which classified the vessel shall be used which contains the contents of the stability booklet.

**NOTE:** A stability booklet shall be worded in a form and language comprehensible for the master [with primary responsibility] and contains 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
- 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 each tank
- 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 is to be clearly indicated, and a copy of the approved inclining test report relevant to this sister vessel is to be included
- A copy of the approved test report is to 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 and
- Longitudinal bending moments and transverse forces at read out points.
- Information about openings (location, type of tightness, means of closure)."

Explanation: To date the information value and the capacity of the vessel substance list according to which the listed products may be carried on the relevant vessel in every respect, i.e. also with regard to maintaining stability, have not been described with sufficient clarity.

On the other hand, as practice shows, it has not been sufficiently ensured that the stability documents were available on board in a form comprehensible to the master. An inspection and evaluation of a lengthy stability booklet in case of a lengthy substance list would not be possible without impairing the required expeditious loading process of a vessel in an individual case. It would also mean extra work and expense for the classification societies when preparing such documents. Hence, the vessel's crew may also be provided with a computer-based loading system, provided that it has been accepted and approved for the specific vessel by the classification society responsible for the vessel substance list.

(b) Add the following new definition in 1.2.1:

*"Loading computer system:* A loading computer system consists of a computer (hardware) and a programme (software) and offers the possibility of ensuring that in every ballast or loading case

- the permissible values concerning longitudinal [and transverse] strength [as well as the maximum sinkage depth] are not exceeded; and
- the stability of the vessel complies with the requirements applicable to the vessel. For this purpose intact stability and damage stability shall be calculated."

Explanation: To ensure uniform interpretation by all Contracting Parties and parties involved in carriage, the loading computer system now required for the first time needs to be defined.

Stability considerations have not included the transverse strength and sinkage depth. Now the opportunity can be used to check these criteria in one operation by using the loading computer system.

- (c) Add a new transitional measure 1.6.7.2.4 as follows:

"1.6.7.2.4 Paragraph 9.3.X.13.3 may be applied until 31 December 2014 in the version applicable on 31 December 2012."

Explanation: The procurement of loading computer systems for all potential vessels and the necessary briefing of the vessel's crew cannot be ensured without unreasonable effort within the general transitional period up to 30 June 2013.

### **III. Safety of carriage**

8. Adoption of the amendments will improve safety when dangerous goods are carried by inland tank vessels with regard to maintaining the stability of the relevant vessel.

### **IV. Practicability**

9. Costly shipbuilding investments are avoided. According to estimations by the German delegation investments for level indicators and for the procurement of loading computer systems remain within justifiable and reasonable financial limits. Such equipment is available on the market and is partially in use already.

10. Extended training requirements for masters (provision of training and examination capacities, release of masters from duty for training periods by carriers) will result in extra work and expense for the competent authorities of Contracting Parties and transport operators.

11. The extent will vary depending on the Contracting Party and the national requirements for training and examinations. However, the German delegation is of the opinion that it is reasonable given the greater degree of safety of carriage. The training provisions in the Regulations annexed to ADN could be eased in future if comparable contents are included in the general training of masters and crews.

12. Regarding the proposed specialization course on stability the informal working group on the catalogue of questions could be requested to further specify examination objectives, training contents and course structures.

13. Drawing up vessel substance lists as well as inspecting and accepting the stability booklets and loading computer systems will mean more work and expense for recognised classification societies. Owners, shipbuilders or transport operators could be charged with such costs. On the one hand, this is justified in view of the gain in carriage safety and, on the other hand, depends on the actual size of the vessel substance list.

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