United Nations ECE/TRANS/SC.3/WP.3/2012/6

Economic and Social Council

Distr.: General
7 December 2011
English
Original: English and Russian

Economic Commission for Europe

Inland Transport Committee

Working Party on Inland Water Transport

Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation

Fortieth session
Geneva, 15–17 February 2012
Item 7 (c) of the provisional agenda
Resolution No. 61, "Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels"

Draft Chapter 17, "Specific requirements applicable to floating equipment"

Note by the Group of Volunteer Experts on Resolution No. 61

I. Mandate

1. At its fifty-third session, the Working Party on Inland Water Transport (SC.3) asked its Group of Volunteer Experts on Resolution No. 61, "Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels" (ECE/TRANS/SC.3/172/Rev.1) to continue preparing amendment proposals to Resolution No. 61 with due regard to the latest amendments to the EU Directive 2006/87/EC laying down technical requirements for inland waterway vessels (ECE/TRANS/SC.3/183, para. 18).

2. At its fifth meeting in Budapest from 6 to 9 September 2011 the Group of Volunteer Experts prepared a proposal on the content of Chapter 17, "Specific requirements applicable to floating equipment", currently left void in Resolution No. 61. In doing so, the group used as a basis the relevant requirements contained in Directive 2006/87/EC.

3. The Working Party may wish to consider the proposal on draft Chapter 17, as presented below.

4. The Group of Volunteer Experts also proposes adding a new section 3-4.1.9 to Chapter 3 of the Resolution to ensure equivalence between the safety requirements applicable to location of accommodation spaces and installations as well as equivalence between the proposed chapter and Chapter 17 of Directive 2006/87/EC. The new section should be worded as follows:

No accommodation or installations needed for vessel safety or operation may be located ahead of the plane of the collision bulkhead. This requirement shall not apply to anchor gear.

II. Draft Chapter 17, "Specific requirements applicable to floating equipment"

17-1 General

For construction and equipment of floating equipment Chapters 3, 7 to 14 and 16 shall apply. Floating equipment with its own means of propulsion shall also meet the requirements of Chapters 5 and 6. Propulsion units permitting only short-haul operation shall not constitute own means of propulsion.

17-2 Derogations

17-2.1 The Administration may grant derogations from the following requirements:

(i) Sections 3-4.1.1 to 3-4.1.4 [and 3-4.1.9][1], shall apply mutatis mutandis;

(ii) Section 7-2 shall apply mutatis mutandis;

(iii) the maximum sound pressure levels prescribed by section 12-2.1.8, second sentence, may be exceeded while the floating equipment's working gear is operating, provided that, during service, nobody sleeps on board at night;

(iv) derogations may be granted from other requirements concerning structure, working gear or equipment provided that equal safety is ensured in each case.

17-2.2 The Administration may dispense with the application of the following requirements:

(i) Section 10-1, if during operation of floating equipment that equipment can be securely anchored by means of a working anchor or piles. However, floating equipment with its own means of propulsion shall have at least one anchor meeting the requirements in section 10-1.2.1, where an empirical coefficient k is taken to be equal to 45, and the smallest height is taken for T, or in section 10-1.2.2;

(ii) Section 12-4.1, second part of sentence, if the accommodation can be adequately lit by means of electricity.

17-2.3 In addition, the following shall apply:

(i) for section 8-1.6.2, second sentence, the bilge pump shall be motor driven;

(ii) for section 8B-8.3, the noise may exceed 65 dB(A) at a lateral distance of 25 m from the ship's side of any stationary floating equipment while its working gear is operating;

(iii) for section 10-3.1, at least one further portable extinguisher is required if working gear not permanently attached to the craft is placed on the deck. The extinguisher shall be located in the vicinity of this working gear;

(iv) for section 14-2.2, in addition to the liquefied-gas equipment for domestic use, there may also be other liquefied-gas facilities. Those facilities and their accessories shall meet the requirements of the Administration.

[1] A new section 3-4.1.9 should be introduced (see paragraph 4 of Section I of this document).

17-3 Additional requirements

17-3.1 Floating equipment on which persons are present during operation shall be fitted with a general alarm system. The alarm signal shall be clearly distinguishable from other signals and, within accommodation and at all control centres, shall produce a sound pressure level that is at least 5 dB(A) higher than the maximum local sound pressure level. It shall be possible to actuate the alarm system from the wheelhouse and the main work stations.

17-3.2 Working equipment shall have sufficient strength to withstand the loads it is subjected to and shall meet the relevant requirements of the Administration.

17-3.3 The stability (resistance to overbalancing) and strength of working equipment, and where appropriate its attachments, shall be such that it may withstand the forces resulting from the expected heel, trim and movement of the floating equipment.

17-3.4 If loads are lifted by means of hoists the maximum authorised load deriving from stability and strength shall be prominently displayed on panels on deck and at the control stations. If the lifting capacity can be increased by connecting additional floats the values authorised both with and without these additional floats shall be clearly stated.

17-4 Residual safety clearance

17-4.1 For the purposes of this Chapter and by way of derogation from section 1-2, residual safety clearance means the shortest vertical distance between surface of the water and the lowest part of the floating equipment beyond which it is no longer watertight, taking into account trim and heel resulting from the moments referred to in section 17-7.4.

17-4.2 The residual safety clearance is sufficient according to section 17-7.1, for any spray-proof and weathertight aperture if it is at least 300 mm.

17-4.3 At an aperture that is not spray-proof and weathertight the residual safety clearance shall be at least 400 mm.

17-5 Residual freeboard

17-5.1 For the purposes of this Chapter and by way of derogation from section 1-2, residual freeboard means the smallest vertical distance between the surface of the water and the upper surface of the deck at its edge taking into account trim and heel resulting from the moments referred to in section 17-7.4.

17-5.2 The residual freeboard is sufficient according to section 17-7.1, if it is at least 300 mm.

17-5.3 The residual freeboard may be reduced if it is proven that the requirements of section 17-8 have been met.

17-5.4 Where the shape of a float differs perceptibly from that of a pontoon, as in the case of a cylindrical float, or where the cross-section of a float has more than four sides, the Administration may require or authorise a residual freeboard that differs from section 17-5.2. This shall also apply to floating equipment consisting of several floats.

17-6 Heeling test

17-6.1 Confirmation of stability according to sections 17-7 and 17-8 shall be based on a heeling test that has been carried out in a proper manner.

17-6.2 If during a heeling test it is not possible to achieve adequate heeling angles, or if the heeling test causes unreasonable technical difficulties, this may be replaced by a calculation of the craft's centre of gravity and weight. The result of the weight calculation shall be checked by measuring the draught, and the difference shall not exceed ± 5 %.

17-7 Confirmation of stability

17-7.1 It shall be confirmed that, when taking into account the loads applied during operation of the working gear and whilst under way, the residual freeboard and the residual safety clearance are sufficient. For that purpose the sum of the trim and heeling angles shall not exceed 10° and the bottom of the float shall not emerge.

17-7.2 Confirmation of stability shall include the following data and documents:

(i) scale drawings of floats and working gear and the detailed data relating to these that are needed to confirm stability, such as content of the tanks, openings providing access to the inside of the vessel;

(ii) hydrostatic data or curves;

(iii) righting lever curves for static-stability to the extent required in accordance with paragraph (v) below or section 17-8;

(iv) description of the operating conditions together with the corresponding data concerning weight and centre of gravity, including its unladen state and the position of the working gear when the floating equipment is underway;

(v) calculation of the heeling, trimming and righting moments, with a specification of the trim and heeling angles and the corresponding residual freeboard and residual safety clearances;

(vi) a compilation of the results of the calculation with a specification of the limits for operation and the maximum loads.

17-7.3 Confirmation of stability shall be based on at least the following load assumptions:

(i) specific mass of the dredging products for dredgers:

- sands and gravels: 1,5 t/m^3,
- very wet sands: 2,0 t/m^3,
- soil, on average: 1,8 t/m^3,
- mixture of sand and water in the ducts: 1,3 t/m^3;

(ii) for clamshell dredgers, the values given under point (i) shall be increased by 15 %;

(iii) for hydraulic dredgers the maximum lifting power shall be considered.

17-7.4.1 Confirmation of stability shall take account of the moments resulting from:

(i) load;

(ii) asymmetric structure;

(iii) wind pressure;

(iv) turning whilst under way of self-propelled floating equipment;

(v) cross current, if necessary;

(vi) ballast and provisions;

(vii) deck loads and, where appropriate, cargo;

(viii) free surfaces of liquids;

(ix) inertia forces;

(x) other mechanical equipment.

The moments which may act simultaneously shall be added up.

17-7.4.2 The moment caused by the wind pressure shall be calculated in accordance with the following formula:

$$M_w = c \cdot \rho_w \cdot A\left(l_w + \frac{T}{2}\right) \quad [kNm]$$

where:

c = shape-dependent coefficient of resistance

For frameworks c = 1,2 and for solid-section beams c = 1,6. Both values take account of gusts of wind.

The whole area encompassed by the contour line of the framework shall be taken to be the surface area exposed to the wind.

ρ_w = specific wind pressure; this shall uniformly be taken to be 0,25 kN/m^2;

A = lateral plane above the plane of maximum draught in m^2;

l_w = distance from the centre of area of the lateral plane A from the plane of maximum draught, in m.

17-7.4.3 In order to determine the moments due to turning whilst under way according to section 17-7.4.1 (iv) for self-propelled floating equipment, the formula set out in section 15-3.6 shall be used.

17-7.4.4 The moment resulting from cross current according to section 17-7.4.1 (v) shall be taken into account only for floating equipment which is anchored or moored across the current while operating.

17-7.4.5 The least favourable extent of tank filling from the point of view of stability shall be determined and the corresponding moment introduced into the calculation when calculating the moments resulting from liquid ballast and liquid provisions according to paragraph 17-7.4.1 (vi).

17-7.4.6 The moment resulting from inertia forces according to paragraph 17-7.4.1 (i) shall be given due consideration if the movements of the load and the working gear are likely to affect stability.

17-7.5 The righting moments for floats with vertical side walls may be calculated using the following formula:

$$M_a = 10 \cdot \mathrm{D} \cdot \overline{MG} \cdot \sin\varphi \quad (kNm)$$

where:

$\overline{MG}$ = metacentric height, in m;

φ = heeling angle in degrees.

That formula shall apply up to heeling angles of 10° or up to a heeling angle corresponding to immersion of the edge of the deck or emergence of the edge of the bottom; the smallest angle shall be decisive. The formula may be applied to slanting side walls up to heeling angles of 5°; the limit conditions set out in the sections 17-7.3 and 17-7.4 shall also apply. If the particular shape of the float(s) does not permit

such simplification the righting lever curves according to section 17-7.2 (iii) shall be required.

17-8 Confirmation of stability in the case of reduced residual freeboard

If a reduced residual freeboard according to section 17-5.3, is used, it shall be proven for all operating conditions that:

(i) after correction for the free surfaces of liquids, the metacentric height is not less than 0,15 m;

(ii) for heeling angles between 0 and 30°, there is a righting lever of at least

$h = 0{,}30 - 0{,}28 \cdot \varphi_n$ (m)

φ_n being the heeling angle from which the righting lever curve displays negative values (range of stability); it shall not be less than 20° or 0,35 rad and shall not be introduced into the formula for more than 30° or 0,52 rad, taking the radian (rad) (1° = 0,01745 rad) for the unit of φ°;

(iii) the sum of the trim and heeling angles does not exceed 10°;

(iv) a residual safety clearance meeting the requirements in section 17-4 remains;

(v) a residual freeboard of at least 0,05 m remains;

(vi) for heeling angles between 0 and 30°, a residual righting lever of at least

$h = 0{,}20 - 0{,}23 \cdot \varphi_n$ (m)

remains, where φ_n is the heeling angle from which the righting lever curve displays negative values; it shall not be introduced into the formula for more than 30° or 0,52 rad.

Residual righting lever means the maximum difference existing between 0° and 30° of heel between the righting lever curve and the heeling lever curve. If an opening towards the inside of the vessel is reached by the water at a heeling angle less than that corresponding to the maximum difference between the lever curves, the lever corresponding to that heeling angle shall be taken into account.

17-9 Draught marks and draught scales

Draught marks and draught scales shall be affixed in accordance with Article 6 of the Annex to the Convention on the Measurement of Inland Navigation Vessels of 15 February 1966.

17-10 Floating equipment without confirmation of stability

17-10.1 The application of sections 17-4 to 17-8 may be dispensed with for floating equipment:

(i) whose working gear can in no way alter their heeling or trim, and

(ii) where any displacement of the centre of gravity can be reasonably excluded.

17-10.2 However,

(i) at maximum load the safety clearance shall be at least 300 mm and the freeboard at least 150 mm;

(ii) for apertures which cannot be closed spray-proof and weathertight the safety clearance shall be at least 500 mm.

17.11 Attestation of a recognised classification society

The administration may consider the requirements of sections 17-4 to 17-8 to be met by craft built in conformity with the rules of a recognised classification society, which shall be confirmed by an attestation of that society.