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GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF OFFSHORE SUPPLY VESSELS

THE ASSEMBLY,

RECALLING Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization,

NOTING that offshore supply vessels are increasingly being employed in offshore operations,

RECOGNIZING that both the design and normal operation of offshore supply vessels differ from those of conventional cargo ships and that by virtue of this the application of the International Convention for the Safety of Life at Sea, 1974, is often inappropriate in respect of such vessels,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its forty-third session,

1. ADOPTS the Guidelines for the Design and Construction of Offshore Supply Vessels, the text of which is set out in the Annex to this resolution, which supersedes the Recommendation on Intact Stability Requirements for Offshore Supply Vessels (MSC/Circ.223);

2. RECOMMENDS that all Governments concerned:

(a) Take appropriate steps to give effect to the Guidelines as soon as possible;

(b) Consider the Guidelines as an equivalent to the corresponding requirements of the International Convention for the Safety of Life at Sea, 1974, for those offshore supply vessels operating internationally;

3. AUTHORIZES the Maritime Safety Committee to amend the Guidelines as may be necessary to incorporate new features of offshore supply vessels which may be introduced.

ANNEX

GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF OFFSHORE SUPPLY VESSELS

CONTENTS

PREAMBLE

1 These Guidelines have been developed for the design and construction of new offshore supply vessels with a view to promoting the safety of such vessels and their personnel, recognizing the unique design features and service characteristics of these vessels.

2 These Guidelines furthermore provide a standard of safety equivalent to the relevant requirements of the International Convention for the Safety of Life at Sea, 1974, and in particular to the stability criteria of the Recommendation on Intact Stability for Passenger and Cargo Ships under 100 m in Length, as amended with respect to ships carrying deck cargo (resolutions A.167(ES.IV) and A.206(VII)).

3 Recognizing that for certain limited areas of operation and service characteristics it is unreasonable to apply these Guidelines in full, the possibility of relaxations has been introduced by the concept of "near-coastal voyage".

4 Provisions for offshore supply vessels carrying more than 12 industrial personnel are not included in these Guidelines.

5 When an offshore supply vessel is used for special purposes, such as diving assistance or oceanographic surveys, the persons on board in connexion with these special purposes should be treated as special personnel.

1 GENERAL

1.1 Application

1.1.1 Every new decked offshore supply vessel of 24 metres and over but not more than 100 metres in length should comply with the provisions of Parts 2 and 3 of these Guidelines. The intact and damage stability of a vessel of more than 100 metres in length should be to the satisfaction of the Administration.

1.1.2 Parts 4, 5, 6 and 7 of these Guidelines apply to every new decked offshore supply vessel of 500 tons gross tonnage and above.

1.1.3 Where these Guidelines set forth alternative safety standards to those contained in the International Convention for the Safety of Life at Sea, 1974,(hereinafter called the Convention) and where the Convention is applicable, these Guidelines may be applied under the equivalency provisions of Regulation 5 of Chapter I of the Convention.

1.1.4 For a vessel engaged in near-coastal voyages, the principles in 1.3 of these Guidelines should guide the Administration in the development of its national standards. Relaxations from the requirements of these Guidelines may be permitted by an Administration for vessels engaged in near-coastal voyages off its own coasts provided the operating conditions are, in the opinion of that Administration, such as to render compliance with the Guidelines unreasonable or unnecessary.

1.1.5 Unless expressly provided otherwise, an existing offshore supply vessel should be required to comply with these Guidelines as far as is practicable in the opinion of the Administration.

1.1.6 Where a vessel other than an offshore supply vessel, as defined in 1.2.1, is employed on a similar service, the Administration should determine the extent to which compliance with these Guidelines is required.

1.2 Definitions

For the purpose of these Guidelines, unless expressly provided otherwise:

1.2.1 "Offshore supply vessel" means a vessel:

.1 which is primarily engaged in the transport of stores, materials and equipment to offshore installations; and

.2 which is designed with accommodation and bridge erections in the forward part of the vessel and an exposed cargo deck in the after part for the handling of cargo at sea.

1.2.2 "New vessel" means a vessel the keel of which is laid or which is at a similar stage of construction six months after the date on which these Guidelines were adopted.

1.2.3 "Existing vessel" means a vessel which is not a new vessel.

1.2.4 The terms "length (L) of a vessel", "perpendiculars", "weathertight" and "summer load line" have the meanings as defined in the International Convention on Load Lines, 1966.

1.2.5 "Administration" means the Government of the State whose flag the vessel is entitled to fly.

1.2.6 "Offshore installation" means a marine structure located at an offshore site.

1.2.7 "Near-coastal" voyage means a voyage in the vicinity of the coast of a State as defined by the Administration of that State.

1.3 Principles governing near-coastal voyages

1.3.1 The Administration defining near-coastal voyages for the purpose of these Guidelines should not impose design and construction standards for a vessel entitled to fly the flag of another State and engaged in such voyages in a manner resulting in a more stringent standard for such a vessel than for a vessel entitled to fly its own flag. In no case should the Administration impose, in respect of a vessel entitled to fly the flag of another State, standards in excess of these Guidelines for a vessel not engaged in near-coastal voyages.

1.3.2 With respect to a vessel regularly engaged in near-coastal voyages off the coast of another State the Administration should prescribe design and construction standards for such a vessel at least equal to those prescribed by the Government of the State off whose coast the vessel is engaged, provided such standards do not exceed these Guidelines in respect of a vessel not engaged in near-coastal voyages.

1.3.3 A vessel which extends its voyage beyond a near-coastal voyage should comply with these Guidelines.

2 INTACT STABILITY

2.1 Constructional precautions against capsizing

2.1.1 Air pipes and ventilators should be fitted in protected positions in order to avoid damage by cargo during operations and to minimize the possibility of flooding. Air pipes on the exposed cargo and forecastle decks should be fitted with automatic closing devices.

2.1.2 Access to the machinery space should, if possible, be arranged within the forecastle. Any access to the machinery space from the exposed cargo deck should be provided with two weathertight closures. Access to spaces below the exposed cargo deck should preferably be from a position within or above the superstructure deck.

2.1.3 Due regard should be given to the position of machinery space ventilators. Preferably they should be fitted in a position above the superstructure deck, or above an equivalent level if no superstructure deck is fitted.

2.1.4 Hatches, doors, etc. which give access to the cargo deck should be kept closed during navigation, except when necessarily opened for the working of the vessel, and should always be ready for immediate closure and be clearly marked to indicate that these fittings are to be kept closed except for access.

2.1.5 The area of the freeing ports in the side bulwarks on the cargo deck should at least meet the requirements of Regulation 24 of the International Convention on Load Lines, 1966. The disposition of the freeing ports should be carefully considered to ensure the most effective drainage of water trapped in pipe deck cargoes or in recesses at the after end of the forecastle. In vessels operating in areas where icing is likely to occur, no shutters should be fitted in the freeing ports.

2.1.6 The Administration should give special attention to adequate drainage of pipe stowage positions having regard to the individual characteristics of the vessel. However, the area provided for drainage of the pipe stowage positions should be in excess of the required freeing port area in the cargo deck bulwarks and should not be fitted with shutters.

2.1.7 A vessel engaged in towing operations should be provided with means for quick release of the towing hawser.

2.2 Operational precautions against capsizing

2.2.1 Compliance with the stability criteria does not ensure immunity against capsizing regardless of the circumstances or absolve the master from his responsibilities. The master should therefore exercise prudence and good seamanship having regard to the season of the year, weather forecasts and the navigational zone and should take the appropriate action as to speed and course warranted by the prevailing circumstances. With regard to icing conditions, reference is made to the Recommendation for Skippers of Fishing Vessels on Ensuring a Vessel's Endurance in Conditions of Ice Formation (resolution A.269(VIII)).

2.2.2 Care should be taken to ensure that the cargo allocated to the vessel is capable of being stowed in such a way that compliance with the stability criteria can be achieved. If necessary the amount of cargo should be limited so as to allow any required ballast water to be taken.

2.2.3 Before a voyage commences care should be taken to ensure that the cargo and sizeable pieces of equipment have been properly stowed or lashed so as to minimize the possibility of both longitudinal and lateral shifting while at sea, under the effect of acceleration caused by rolling and pitching. The arrangement of cargo stowed on deck should be such as to avoid any obstruction of the freeing ports or of the areas necessary for the drainage of pipe stowage positions to the freeing ports.

2.2.4 A vessel, when engaged in towing operations, should not carry deck cargo, except that a limited amount, properly secured, which would neither endanger the safe working of the crew on deck nor impede the proper functioning of the towing equipment, may be accepted.

2.2.5 A minimum freeboard at the stern of at least 0.005 L should be maintained in all operating conditions.

2.3 Stability curves

The methods for calculating stability righting arms should be in accordance with 2.8 and the degree of accuracy obtained should be acceptable to the Administration.

2.4 Assessment of compliance with stability criteria

2.4.1 For the purpose of assessing in general whether the stability criteria are met, stability curves should be drawn for the main loading conditions intended by the owner in respect of the vessel's operations.

2.4.2 If the owner of the vessel does not supply sufficiently detailed information regarding such loading conditions, calculations should be made for the standard loading conditions given in 2.9.

2.4.3 In all cases calculations should be based on the assumptions shown in 2.10.

2.5 Stability criteria

2.5.1 The following stability criteria are recommended:

.1 The area under the righting lever curve (GZ curve) should not be less than 0.055 metre-radians up to $\theta = 30^\circ$ angle of heel and not less than 0.09 metre-radians up to $\theta = 40^\circ$ or the angle of flooding θ_f* if this angle is less than 40°. Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and θ_f, if this angle is less than 40°, should not be less than 0.03 metre-radians.

.2 The righting lever GZ should be at least 0.20 m at an angle of heel equal to or greater than 30°.

.3 The maximum righting arm should occur at an angle of heel preferably exceeding 30° but not less than 25°.

.4 The initial metacentric height GM_0 should not be less than 0.15 m.

2.5.2 The following equivalent criteria are recommended where a vessel's characteristics render compliance with 2.5.1 impracticable:

.1 The area under the curve of righting levers (GZ curve) should not be less than 0.070 metre-radians up to an angle of 15° when the maximum righting lever (GZ) occurs at 15° and 0.055 metre-radians up to an angle of 30° when the maximum righting lever (GZ) occurs at 30° or above. Where the maximum righting lever (GZ) occurs at angles of between 15° and 30°, the corresponding area under the righting lever curve should be:

$$0.055 + 0.001\ (30^\circ - \theta_{max})\ \text{metre-radians}^{**}$$

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* θ_f is the angle of heel in degrees at which openings in the hull, superstructure or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open.

** θ_{max} is the angle of heel in degrees at which the righting lever curve reaches its maximum.

.2 The area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40°, or between 30° and Θ_f if this angle is less than 40°, should be not less than 0.03 metre-radians.

.3 The righting lever (GZ) should be at least 0.20 m at an angle of heel equal to or greater than 30°.

.4 The maximum righting lever (GZ) should occur at an angle of heel not less than 15°.

.5 The initial transverse metacentric height (GM_o) should not be less than 0.15 m.

2.5.3 The stability criteria mentioned in 2.5.1 and 2.5.2 are minimum values; no maximum values are recommended. It is advisable to avoid excessive values, since these might lead to acceleration forces which could be prejudicial to the vessel, its complement, its equipment and the safe carriage of the cargo.

2.5.4 Where anti-rolling devices are installed in a vessel the Administration should be satisfied that the stability criteria in 2.5.1 and 2.5.2 can be maintained when the devices are in operation.

2.5.5 A number of factors such as beam wind on a vessel with large windage area, icing, rolling characteristics, following seas, etc., adversely affect stability and the Administration is advised to take these into account so far as is deemed necessary.

2.6 Inclining test

2.6.1 When construction is completed, the vessel should undergo an inclining test, actual displacement and co-ordinates of the centre of gravity being determined for the light ship condition.

2.6.2 The Administration may allow the inclining test of an individual vessel to be dispensed with, provided basic stability data are available from the inclining test of a sister vessel.

2.6.3 Where alterations are made to a vessel affecting its light condition and the position of its centre of gravity, the vessel should be re-inclined and the light condition information revised, provided the Administration considers this necessary.

2.7 Stability information

2.7.1 The master should receive information which will enable him to assess with ease and certainty the stability of the vessel in different service conditions. A duplicate of this information should be communicated to the Administration.

2.7.2 The stability information should comprise:

.1 Stability characteristics of typical loading conditions.

.2 Information in the form of tables or diagrams which will enable the master to assess the stability of the vessel and verify whether the stability is sufficient in all loading conditions differing from loading conditions specified in 2.4.1 or 2.4.2. This information should include, in particular, a curve or table giving, as a function of draught and trim, the required initial metacentric height GM_o (or any other stability parameter) which ensures that the stability is in compliance with the criteria given in 2.5.1 or 2.5.2.

.3 Information on the proper use of anti-rolling devices if these are installed in the vessel.

.4 Notes on the corrections to be made to the initial metacentric height GM_o to take account of the free surface effect of liquids.

2.8 Calculation of stability curves

2.8.1 The following should be assumed in the calculations:

.1 Hydrostatic and stability curves should be prepared for the operating trim conditions taking into account the change in trim due to heel.

.2 The calculations should take into account the volume to the upper surface of the deck sheathing.

2.8.2 The following superstructures, deckhouses, etc. may be taken into account in the calculations:

.1 Enclosed superstructures complying with Regulation 3(10)(b) of the International Convention on Load Lines, 1966.

.2 The second tier of similarly enclosed superstructures.

.3 Deckhouses on the freeboard deck, provided that they comply with the conditions for enclosed superstructures as referred to in .1.

.4 Where deckhouses comply with the above conditions, except that no additional exit is provided to a deck above, such deckhouses should not be taken into account; however, any deck openings inside such deckhouses should be considered as closed even where no means of closure are provided.

.5 Deckhouses, the doors of which do not comply with the requirements of Regulation 12 of the International Convention on Load Lines, 1966, should not be taken into account; however, any deck openings inside the deckhouse are regarded as closed where their means of closure comply with the requirements of Regulations 15, 17 or 18 of that Convention.

.6 Deckhouses on decks above the freeboard deck should not be taken into account but openings within them may be regarded as closed.

.7 Superstructures and deckhouses not regarded as enclosed can, however, be taken into account in stability calculations up to the angle at which their openings are immersed. (At this angle, the static stability curve should show one or more steps, and in subsequent computations the flooded space should be considered non-existent.)

.8 In cases where the vessel would sink due to flooding through any openings, the stability curve should be cut short at the corresponding angle of flooding and the vessel should be considered to have entirely lost its stability.

.9 Small openings such as those for passing wires or chains, tackle and anchors, and also holes of scuppers, discharge and sanitary pipes should not be considered as open if they submerge at an angle of inclination more than 30°. If they submerge at an angle of 30° or less, these openings should be assumed open if the Administration considers them to be a source of significant flooding.

2.8.3 For all loading conditions, the initial metacentric height and the stability curves should be corrected for the effect of free surfaces of liquids in tanks in accordance with the following assumptions:

.1 Tanks which are taken into consideration when determining the effect of liquids on the stability at all angles of inclination should include single tanks or combinations of tanks for each kind of liquid (including those for water ballast) which according to the service conditions can simultaneously have free surfaces.

.2 For the purpose of determining this free surface correction, the tanks assumed slack should be those which develop the greatest free surface moment, $M_{f.s.}$ at a 30° inclination, when in the 50 per cent full condition. Alternatively, the actual free surface effects may be used provided the methods of calculation are acceptable to the Administration.

.3 The value of $M_{f.s.}$ for each tank may be derived from the formula

$$M_{f.s.} = vb\gamma k\sqrt{\delta}$$

where:

$M_{f.s.}$ = the free surface moment at any angle of inclination in metre-tons,

v = the tank total capacity in cubic metres,

b = the tank maximum breadth in metres,

γ = the specific weight of liquid in the tank in tons per cubic metre,

$\delta = \frac{v}{blh}$ = the tank block coefficient,

h = the tank maximum height in metres,

l = the tank maximum length in metres,

k = dimensionless coefficient to be determined from the following table according to the ratio b/h. The intermediate values are determined by interpolation (linear or graphic).

.4 Small tanks, which satisfy the following condition using the value of k corresponding to the angle of inclination of 30°, need not be included in computation:

$$vb\gamma k\sqrt{\delta} < 0.01\Delta_{min}$$

where

Δ_{min} = minimum displacement in metric tons.

.5 The usual remainder of liquids in empty tanks is not taken into account in computation.

TABLE OF VALUES FOR COEFFICIENT "K" FOR CALCULATING FREE SURFACE CORRECTIONS

$k = \frac{\sin\theta}{12}\left(1 + \frac{\tan^2}{2}\right) \times b/h$ where $\cot\theta \geq b/h$

$k = \frac{\cos\theta}{8}\left(1 + \frac{\tan\theta}{b/h}\right) - \frac{\cos\theta}{12(b/h)}\,2\left(1 + \frac{\cot^2\theta}{2}\right)$ where $\cot\theta \leq b/h$

θ / b/h	5°	10°	15°	20°	30°	40°	45°	50°	60°	70°	75°	80°	90°	θ / b/h
20	0.11	0.12	0.12	0.12	0.11	0.10	0.09	0.09	0.07	0.05	0.04	0.03	0.01	20
10	0.07	0.11	0.12	0.12	0.11	0.10	0.10	0.09	0.07	0.05	0.04	0.03	0.01	10
5	0.04	0.07	0.10	0.11	0.11	0.11	0.10	0.10	0.08	0.07	0.06	0.05	0.03	5
3	0.02	0.04	0.07	0.09	0.11	0.11	0.11	0.10	0.09	0.08	0.07	0.06	0.04	3
2	0.01	0.03	0.04	0.06	0.09	0.11	0.11	0.11	0.10	0.09	0.09	0.08	0.06	2
1.5	0.01	0.02	0.03	0.05	0.07	0.10	0.11	0.11	0.11	0.11	0.10	0.10	0.08	1.5
1	0.01	0.01	0.02	0.03	0.05	0.07	0.09	0.10	0.12	0.13	0.13	0.13	0.13	1
0.75	0.01	0.01	0.02	0.02	0.04	0.05	0.07	0.08	0.12	0.15	0.16	0.16	0.17	0.75
0.5	0.00	0.01	0.01	0.02	0.02	0.04	0.04	0.05	0.09	0.16	0.18	0.21	0.25	0.5
0.3	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.03	0.05	0.11	0.19	0.27	0.42	0.3
0.2	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.04	0.07	0.13	0.27	0.63	0.2
0.1	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.04	0.06	0.14	1.25	0.1

2.9 Loading conditions

The standard loading conditions referred to in 2.4.2 should be as follows:

.1 Vessel in fully loaded departure condition with cargo distributed below deck and with cargo specified by position and weight on deck, with full stores and fuel, corresponding to the worst service condition in which all the relevant stability criteria are met.

.2 Vessel in fully loaded arrival condition with cargo as specified in .1, but with 10 per cent stores and fuel.

.3 Vessel in ballast departure condition, without cargo but with full stores and fuel.

.4 Vessel in ballast arrival condition, without cargo and with 10 per cent stores and fuel remaining.

.5 Vessel in the worst anticipated operating condition.

2.10 Assumptions for calculating loading conditions

The assumptions for calculating loading conditions should be as follows:

.1 If a vessel is fitted with cargo tanks, the fully loaded conditions of 2.9.1 and 2.9.2 should be modified, assuming first the cargo tanks full and then the cargo tanks empty.

.2 If in any loading condition water ballast is necessary, additional diagrams should be calculated, taking into account the water ballast, the quantity and disposition of which should be stated in the stability information.

.3 In all cases when deck cargo is carried a realistic stowage weight should be assumed and stated in the stability information, including the height of the cargo and its centre of gravity.

.4 Where pipes are carried on deck, a quantity of trapped water equal to a certain percentage of the net volume of the pipe deck cargo should be assumed in and around the pipes. The net volume should be taken as the internal volume of the pipes, plus

the volume between the pipes. This percentage should be 30 if the freeboard amidships is equal to or less than 0.015 L and 10 if the freeboard amidships is equal to or greater than 0.03 L. For intermediate values of the freeboard amidships the percentage may be obtained by linear interpolation. In assessing the quantity of trapped water, the Administration may take into account positive or negative sheer aft, actual trim and area of operation.

3 SUBDIVISION AND DAMAGE STABILITY

3.1 General

Taking into account, as initial conditions before flooding, the standard loading conditions as referred to in 2.9 and 2.10 and the damage assumptions in 3.2, the vessel should comply with the damage stability criteria as specified in 3.3.

3.2 Damage assumptions

3.2.1 Damage should be assumed to occur anywhere in the vessel's length between transverse watertight bulkheads.

3.2.2 The vertical extent of damage should be assumed from the underside of the cargo deck, or the continuation thereof, for the full depth of the vessel.

3.2.3 The transverse extent of damage should be assumed as 760 mm, measured inboard from the side of the vessel perpendicularly to the centreline at the level of the summer load waterline.

3.2.4 A transverse watertight bulkhead extending from the vessel's side to a distance inboard of 760 mm or more at the level of the summer load line joining longitudinal watertight bulkheads may be considered as a transverse watertight bulkhead for the purpose of the damage calculations.

3.2.5 If pipes, ducts or tunnels are situated within the assumed extent of damage, arrangements should be made to ensure that progressive flooding cannot thereby extend to compartments other than those assumed to be floodable for each case of damage.

3.2.6 If damage of a lesser extent than that specified in 3.2.2 and/or 3.2.3 results in a more severe condition, such lesser extent should be assumed.

3.2.7 Where a transverse watertight bulkhead is located within the transverse extent of assumed damage and is stepped in way of a double bottom or side tank by more than 3.05 m, the double bottom or side tanks adjacent to the stepped portion of the transverse watertight bulkhead should be considered as flooded simultaneously.

3.3 Damage stability criteria

3.3.1 The final waterline, taking into account sinkage, heel and trim, should be below the lower edge of any opening through which progressive flooding may take place. Such openings should include air pipes and those which are capable of being closed by means of weathertight doors or hatch covers and may exclude those openings closed by means of watertight manhole covers and flush scuttles, small watertight cargo tank hatch covers which maintain the high integrity of the deck, remotely operated watertight sliding doors, and side scuttles of the non-opening type.

3.3.2 In the final stage of flooding, the angle of heel due to unsymmetrical flooding should not exceed 15°. This angle may be increased up to 17° if no deck immersion occurs.

3.3.3 The stability in the final stage of flooding should be investigated and may be regarded as sufficient if the righting lever curve has at least a range of 20° beyond the position of equilibrium in association with a maximum residual righting lever of at least 100 mm within this range. Unprotected openings should not become immersed at an angle of heel within the prescribed minimum range of residual stability unless the space in question has been included as a floodable space in calculations for damage stability. Within this range, immersion of any of the openings referred to in 3.3.1 and any other openings capable of being closed weathertight may be authorized.

3.3.4 The Administration should be satisfied that the stability is sufficient during intermediate stages of flooding.

3.4 Assumptions for calculating damage stability

3.4.1 Compliance with 3.3 should be confirmed by calculations which take into consideration the design characteristics of the vessel, the arrangements, configuration and permeability of the damaged compartments and the distribution, specific gravities and the free surface effect of liquids.

3.4.2 The permeability of compartments assumed to be damaged should be as follows:

Spaces	Permeability
Appropriated to stores	60
Occupied by accommodation	95
Occupied by machinery	85
Void spaces	95
Intended for dry cargo	95

The permeability of tanks should be consistent with the amount of liquid carried, as shown in the loading conditions specified in 3.1. The permeability of empty tanks should be assumed to be not less than 95.

3.4.3 The free surface effect should be calculated at an angle of heel of 5 degrees for each individual compartment or the effect of free liquid in a tank should be calculated over the range of positive residual righting arm, by assessing the shift of liquids by moment of transference calculations.

3.4.4 Free surface for each type of consumable liquid should be assumed for at least one transverse pair of tanks or a single centreline tank. The tank or tanks to be taken into account should be those where the effect of free surface is the greatest.

3.4.5 Alternatively, the actual free surface effect may be used provided the methods of calculation are acceptable to the Administration.

4 MACHINERY AND ELECTRICAL INSTALLATIONS

The vessel should comply with the provisions for cargo ships of Parts C, D and E of Chapter II-1 of the 1981 amendments to the Convention.

5 FIRE PROTECTION

The vessel should comply with the provisions for cargo ships of Chapter II-2 of the 1981 amendments to the Convention.

6 LIFE-SAVING APPLIANCES

The vessel should comply with the provisions for cargo ships of the revised Chapter III* of the Convention.

7 RADIOCOMMUNICATIONS

The vessel should comply with the provisions for cargo ships of Chapter IV of the Convention, as modified by the 1981 amendments thereto.

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* The provisions of the revised Chapter III should apply, when adopted by the Maritime Safety Committee.