INTERNATIONAL MARITIME ORGANIZATION

E

MARITIME SAFETY COMMITTEE
98th session
Agenda item 23

MSC 98/23/Add.1
30 June 2017
Original: ENGLISH

REPORT OF THE MARITIME SAFETY COMMITTEE ON ITS NINETY-EIGHTH SESSION

Attached are annexes 1 to 10, 12 to 25, 27 to 33 and 39 to the report of the Maritime Safety Committee on its ninety-eighth session (MSC 98/23).

LIST OF ANNEXES

(See document MSC 98/23/Add.2 for annexes 11, 26 and 34 to 38)

***

ANNEX 1

DRAFT MSC RESOLUTION

AMENDMENTS TO PART A OF THE INTERNATIONAL CODE ON INTACT STABILITY, 2008 (2008 IS CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution MSC.267(85) by which it adopted the International Code on Intact Stability, 2008 ("2008 IS Code"),

RECALLING FURTHER resolution MSC.413(97) by which it adopted amendments to the introduction and part A of the 2008 IS Code,

NOTING the provisions regarding the procedure for amendments to the introduction and part A of the 2008 IS Code, stipulated in regulation II-1/2.27.1 of the International Convention for the Safety of Life at Sea, 1974 ("the Convention"), as amended by resolution MSC.269(85),

RECOGNIZING the need to include provisions regarding ships engaged in anchor handling, lifting and towing operations, including escort towing, in the 2008 IS Code,

HAVING CONSIDERED, at its [ninety-ninth session], amendments to part A of the 2008 IS Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, further amendments to part A of the 2008 IS Code adopted by resolution MSC.413(97), the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on [1 July 2019], unless, prior to that date, more than one third of the Contracting Governments to the Convention, or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified the Secretary-General of the Organization of their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on [1 January 2020] upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General of the Organization, for the purposes of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5 REQUESTS ALSO the Secretary-General of the Organization to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO PART A OF THE INTERNATIONAL CODE ON INTACT STABILITY, 2008 (2008 IS CODE)

PART A
MANDATORY CRITERIA

The footnote to the existing title of chapter 2 is deleted.

***

ANNEX 2

DRAFT MSC RESOLUTION

AMENDMENTS TO PART A OF THE INTERNATIONAL CODE ON INTACT STABILITY, 2008 (2008 IS CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution MSC.267(85) by which it adopted the International Code on Intact Stability, 2008 ("2008 IS Code"),

RECALLING FURTHER resolution MSC.414(97) by which it adopted amendments to the introduction and part A of the 2008 IS Code,

NOTING the provisions regarding the procedure for amendments to the introduction and part A of the 2008 IS Code, stipulated in paragraph (16).1 of regulation I/3 of the Protocol of 1988 relating to the International Convention on Load Lines, 1966 ("1988 Load Lines Protocol"), as amended by resolution MSC.270(85),

RECOGNIZING the need to include provisions regarding ships engaged in anchor handling, lifting and towing operations, including escort towing, in the 2008 IS Code,

HAVING CONSIDERED, at its [ninety-ninth session], amendments to part A of the 2008 IS Code, proposed and circulated in accordance with paragraph 2(a) of article VI of the 1988 Load Lines Protocol,

1 ADOPTS, in accordance with paragraph 2(d) of article VI of the 1988 Load Lines Protocol, further amendments to part A of the 2008 IS Code adopted by resolution MSC.414(97), the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with paragraph 2(f)(ii)(bb) of article VI of the 1988 Load Lines Protocol, that the said amendments shall be deemed to have been accepted on [1 July 2019], unless, prior to that date, more than one third of the Parties to the 1988 Load Lines Protocol, or Parties the combined merchant fleets of which constitute not less than 50% of all the merchant fleets of all Parties, have notified the Secretary-General of the Organization of their objections to the amendments;

3 INVITES Parties to the 1988 Load Lines Protocol to note that, in accordance with paragraph 2(g)(ii) of article VI of the 1988 Load Lines Protocol, the amendments shall enter into force on [1 January 2020] upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General of the Organization, for the purposes of paragraph 2(e) of article VI of the 1988 Load Lines Protocol, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to the 1988 Load Lines Protocol;

5 REQUESTS ALSO the Secretary-General of the Organization to transmit copies of this resolution and its annex to Members of the Organization, which are not Parties to the 1988 Load Lines Protocol.

ANNEX

AMENDMENTS TO PART A OF THE INTERNATIONAL CODE ON INTACT STABILITY, 2008 (2008 IS CODE)

PART A
MANDATORY CRITERIA

The footnote to the existing title of chapter 2 is deleted.

***

ANNEX 3

RESOLUTION MSC.421(98)
(adopted on 15 June 2017)

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO article VIII(b) of the International Convention for the Safety of Life at Sea, 1974 ("the Convention"), concerning the amendment procedure applicable to the annex to the Convention, other than to the provisions of chapter I,

HAVING CONSIDERED, at its ninety-eighth session, amendments to the Convention proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that said amendments shall be deemed to have been accepted on 1 July 2019, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified the Secretary-General of their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5 REQUESTS ALSO the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

CHAPTER II-1
CONSTRUCTION – STRUCTURE, SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART A
GENERAL

Regulation 1 – Application

1 The following new paragraphs 1.1.1 and 1.1.2 are inserted after the existing paragraph 1.1:

"1.1.1 Unless expressly provided otherwise, parts B, B-1, B-2 and B-4 of this chapter shall only apply to ships:

.1 for which the building contract is placed on or after 1 January 2020; or

.2 in the absence of a building contract, the keel of which is laid or which are at a similar stage of construction on or after 1 July 2020; or

.3 the delivery of which is on or after 1 January 2024.

1.1.2 Unless expressly provided otherwise, for ships not subject to the provisions of subparagraph 1.1.1 but constructed on or after 1 January 2009, the Administration shall:

.1 ensure that the requirements in parts B, B-1, B-2 and B-4 which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.216(82), MSC.269(85) and MSC.325(90) are complied with; and

.2 ensure that the requirements of regulation 19-1 are complied with."

2 The existing paragraph 1.3.4 is deleted and at the end of the existing paragraph 1.3.3, replaced ";" with ".".

3 The existing paragraph 2 is replaced with the following:

"2 Unless expressly provided otherwise, for ships constructed before 1 January 2009, the Administration shall:

.1 ensure that the requirements which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57), MSC.19(58), MSC.26(60), MSC.27(61), Resolution 1 of the 1995 SOLAS Conference, MSC.47(66), MSC.57(67), MSC.65(68), MSC.69(69), MSC.99(73), MSC.134(76), MSC.151(78) and MSC.170(79) are complied with; and

.2 ensure that the requirements of regulation 19-1 are complied with."

Regulation 2 – Definitions

4 The existing paragraph 2 is replaced with the following:

"2 *Amidships* is at the middle of the length (*L*)."

5 The existing paragraphs 9 and 10 are replaced with the following:

"9 *Draught (d)* is the vertical distance from the keel line at:

.1 amidships, for ships subject to the provisions of regulation II-1/1.1.1.1; and

.2 the mid-point of the subdivision length (L_s), for ships not subject to the provisions of regulation II-1/1.1.1.1 but constructed on or after 1 January 2009;

to the waterline in question.

10 *Deepest subdivision draught (d_s)* is the summer load line draught of the ship."

6 The existing paragraph 13 is replaced with the following:

"13 *Trim* is the difference between the draught forward and the draught aft, where the draughts are measured at the forward and aft:

.1 perpendiculars respectively, as defined in the International Convention on Load Lines in force, for ships subject to the provisions of regulation II-1/1.1.1.1; and

.2 terminals respectively, for ships not subject to the provisions of regulation II-1/1.1.1.1 but constructed on or after 1 January 2009;

disregarding any rake of keel."

7 The existing paragraph 19 is replaced with the following:

"19 *Bulkhead deck* in a passenger ship means the uppermost deck:

.1 to which the main bulkheads and the ship's shell are carried watertight, for ships subject to the provisions of regulation II-1/1.1.1.1; and

.2 at any point in the subdivision length (L_s) to which the main bulkheads and the ship's shell are carried watertight and the lowermost deck from which passenger and crew evacuation will not be impeded by water in any stage of flooding for damage cases defined in regulation 8 and in part B-2 of this chapter, for ships not subject to the provisions of regulation II-1/1.1.1.1 but constructed on or after 1 January 2009.

The bulkhead deck may be a stepped deck. In a cargo ship not subject to the provisions of regulation II-1/1.1.1.1 but constructed on or after 1 January 2009, the freeboard deck may be taken as the bulkhead deck."

8 The existing paragraph 26 is deleted and remaining paragraphs are renumbered accordingly.

PART B
SUBDIVISION AND STABILITY

Regulation 4 – General

9 The existing paragraph 1 and the footnote to existing paragraph 1 are deleted.

10 The following new paragraphs 1 and 2 are introduced before the existing paragraph 2:

"1 Unless expressly provided otherwise, the requirements in parts B-1 to B-4 shall apply to passenger ships.

2 For cargo ships, the requirements in parts B-1 to B-4 shall apply as follows:

2.1 In part B-1:

.1 Unless expressly provided otherwise, regulation 5 shall apply to cargo ships and regulation 5-1 shall apply to cargo ships other than tankers, as defined in regulation I/2(h);

.2 Regulation 6 to regulation 7-3 shall apply to cargo ships having a length (*L*) of 80 m and upwards, but may exclude those ships subject to the following instruments and shown to comply with the subdivision and damage stability requirements of that instrument:

.1 Annex I to MARPOL, except that combination carriers (as defined in SOLAS regulation II-2/3.14) with type B freeboards shall be in compliance with regulation 6 to regulation 7-3*; or

.2 the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code)*; or

.3 the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)*; or

.4 the damage stability requirements of regulation 27 of the 1966 Load Lines Convention as applied in compliance with resolutions A.320(IX) and A.514(13), provided that in the case of cargo ships to which regulation 27(9) applies, main transverse watertight bulkheads, to be considered effective, are spaced according to paragraph (12)(f) of resolution A.320(IX), except that ships intended for the carriage of deck cargo shall be in compliance with regulation 6 to regulation 7-3; or

.5 the damage stability requirements of regulation 27 of the 1988 Load Lines Protocol, except that ships intended for the carriage of deck cargo shall be in compliance with regulation 6 to regulation 7-3; or

.6 the subdivision and damage stability standards in other instruments** developed by the Organization.

2.2 Unless expressly provided otherwise, the requirements in parts B-2 and B-4 shall apply to cargo ships.

---

* Refer to *Guidelines for verification of damage stability requirements for tankers* (MSC.1/Circ.1461).

** .1 For offshore supply vessels of not more than 100 m in length (*L*), the *Guidelines for the design and construction of offshore supply vessels, 2006* (resolution MSC.235(82), as amended by resolution MSC.335(90)); or

.2 For special purpose ships, the *Code of safety for special purpose ships, 2008* (resolution MSC.266(84), as amended)."

11 The existing paragraphs 2 to 4 are renumbered accordingly.

PART B-1
STABILITY

Regulation 5 – Intact stability

12 The footnote to the title is deleted and the existing paragraphs 1 and 2 are replaced with the following:

"1 Every passenger ship, regardless of size, and every cargo ship having a length (*L*) of 24 m and upwards, shall be inclined upon its completion. The lightship displacement and the longitudinal, transverse and vertical position of its centre of gravity shall be determined. In addition to any other applicable requirements of the present regulations, ships having a length of 24 m and upwards shall as a minimum comply with the requirements of part A of the 2008 IS Code.

2 The Administration may allow the inclining test of an individual cargo ship to be dispensed with provided basic stability data are available from the inclining test of a sister ship and it is shown to the satisfaction of the Administration that reliable stability information for the exempted ship can be obtained from such basic data, as required by regulation 5-1. A lightweight survey shall be carried out upon completion and the ship shall be inclined whenever in comparison with the data derived from the sister ship, a deviation from the lightship displacement exceeding 1% for ships of 160 m or more in length and 2% for ships of 50 m or less in length and as determined by linear interpolation for intermediate lengths or a deviation from the lightship longitudinal centre of gravity exceeding 0.5% of *L* is found."

13 The existing paragraph 5 is replaced with the following:

"5 At periodical intervals not exceeding five years, a lightweight survey shall be carried out on all passenger ships to verify any changes in lightship displacement and longitudinal centre of gravity. The ship shall be re-inclined whenever, in comparison with the approved stability information, a deviation from the lightship displacement exceeding 2% or a deviation of the longitudinal centre of gravity exceeding 1% of *L* is found or anticipated."

Regulation 5-1 – Stability information to be supplied to the master

14 The existing footnote to the title of the regulation is replaced with the following:

"* Refer also to the *Guidelines for the preparation of intact stability information* (MSC/Circ.456) and the *Revised guidance to the master for avoiding dangerous situations in adverse weather and sea conditions* (MSC.1/Circ.1228)."

15 The existing regulation 5-1.1 is replaced with the following:

"1 The master shall be supplied with such information to the satisfaction of the Administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service. A copy of the stability information shall be furnished to the Administration."

16 The existing paragraph 2.1 is replaced with the following:

".1 curves or tables of minimum operational metacentric height (*GM*) and maximum permissible trim versus draught which assures compliance with the intact and damage stability requirements where applicable, alternatively corresponding curves or tables of the maximum allowable vertical centre of gravity (*KG*) and maximum permissible trim versus draught, or with the equivalents of either of these curves or tables;"

17 The existing paragraphs 3 and 4 are replaced with the following:

"3 The intact and damage stability information required by regulation 5-1.2 shall be presented as consolidated data and encompass the full operating range of draught and trim. Applied trim values shall coincide in all stability information intended for use on board. Information not required for determination of stability and trim limits should be excluded from this information.

4 If the damage stability is calculated in accordance with regulation 6 to regulation 7-3 and, if applicable, with regulations 8 and 9.8, a stability limit curve is to be determined using linear interpolation between the minimum required *GM* assumed for each of the three draughts d_s, d_p and d_l. When additional subdivision indices are calculated for different trims, a single envelope curve based on the minimum values from these calculations shall be presented. When it is intended to develop curves of maximum permissible *KG* it shall be ensured that the resulting maximum *KG* curves correspond with a linear variation of *GM*.

5 As an alternative to a single envelope curve, the calculations for additional trims may be carried out with one common *GM* for all of the trims assumed at each subdivision draught. The lowest values of each partial index A_s, A_p and A_l across these trims shall then be used in the summation of the attained subdivision index *A* according to regulation 7.1. This will result in one *GM* limit curve based on the *GM* used at each draught. A trim limit diagram showing the assumed trim range shall be developed."

18 The existing paragraph 5 is renumbered accordingly and amended to read as follows:

"6 When curves or tables of minimum operational metacentric height (*GM*) or maximum allowable *KG* versus draught are not provided, the master shall ensure that the operating condition does not deviate from approved loading conditions, or verify by calculation that the stability requirements are satisfied for this loading condition."

Regulation 6 – Required subdivision index R

19 The existing chapeau in paragraph 2 is replaced with the following:

"2 For ships to which the damage stability requirements of this part apply, the degree of subdivision to be provided shall be determined by the required subdivision index *R*, as follows:"

20 The existing chapeau in paragraph 2.2 is replaced with the following:

".2 In the case of cargo ships not less than 80 m in length (*L*) and not greater than 100 m in length (L_s):"

21 The text in the existing paragraph 2.3 is replaced with the following:

"2.3 In the case of passenger ships:

Persons on board	***R***
$N < 400$	$R = 0.722$
$400 \leq N \leq 1{,}350$	$R = N / 7{,}580 + 0.66923$
$1{,}350 < N \leq 6{,}000$	$R = 0.0369 \times \text{Ln}(N + 89.048) + 0.579$
N > 6,000	$R = 1 - (852.5 + 0.03875 \times N) / (N + 5{,}000)$

Where:

N = total number of persons on board."

22 The existing paragraph 2.4 is deleted.

Regulation 7 – Attained subdivision index *A*

23 The first sentence of the existing paragraph 1 is replaced with the following:

"1 An attained subdivision index *A* is obtained by the summation of the partial indices A_s, A_p and A_l, weighted as shown and calculated for the draughts d_s, d_p and d_l defined in regulation 2 in accordance with the following formula:"

24 The existing paragraphs 2 and 3 are replaced with the following:

"2 As a minimum, the calculation of *A* shall be carried out at the level trim for the deepest subdivision draught d_s and the partial subdivision draught d_p. The estimated service trim may be used for the light service draught d_l. If, in any anticipated service condition within the draught range from d_s to d_l, the trim variation in comparison with the calculated trims is greater than 0.5% of *L*, one or more additional calculations of *A* are to be performed for the same draughts but including sufficient trims to ensure that, for all intended service conditions, the difference in trim in comparison with the reference trim used for one calculation will be not more than 0.5% of *L*. Each additional calculation of *A* shall comply with regulation 6.1.

3 When determining the positive righting lever (*GZ*) of the residual stability curve in the intermediate and final equilibrium stages of flooding, the displacement used should be that of the intact loading condition. All calculations should be done with the ship freely trimming."

Regulation 7-1 – Calculation of the factor p_i

25 In the existing paragraph 1, the text of the notation for the mean transverse distance *b* is replaced with the following:

"*b* = the mean transverse distance in metres measured at right angles to the centreline at the deepest subdivision draught between the shell and an assumed vertical plane extended between the longitudinal limits used in calculating the factor p_i and which is a tangent to, or common with, all or part of the outermost portion of the longitudinal bulkhead under consideration. This vertical plane shall be so orientated that the mean transverse distance to the shell is a maximum, but not more than twice the least distance between the plane and the shell. If the upper part of a longitudinal bulkhead is below the deepest subdivision draught the vertical plane used for determination of *b* is assumed to extend upwards to the deepest subdivision waterline. In any case, *b* is not to be taken greater than *B/2*."

Regulation 7-2 – Calculation of the factor s_i

26 The existing paragraphs 2 to 4.1.2 are replaced with the following:

"2 For passenger ships, and cargo ships fitted with cross-flooding devices, the factor $s_{\text{intermediate},i}$ is taken as the least of the *s*-factors obtained from all flooding stages including the stage before equalization, if any, and is to be calculated as follows:

$$S_{\text{intermediate},i} = \left[\frac{GZ_{\max}}{0.05} \times \frac{Range}{7}\right]^{\frac{1}{4}}$$

where GZ_{max} is not to be taken as more than 0.05 m and *Range* as not more than 7°. $s_{\text{intermediate},i}$ = 0, if the intermediate heel angle exceeds 15º for passenger ships and 30° for cargo ships.

For cargo ships not fitted with cross-flooding devices the factor $s_{\text{intermediate},i}$ is taken as unity, except if the Administration considers that the stability in intermediate stages of flooding may be insufficient, it should require further investigation thereof.

For passenger and cargo ships, where cross-flooding devices are fitted, the time for equalization shall not exceed 10 min.

3 The factor $s_{final,i}$ shall be obtained from the formula:

$$S_{\text{final},i} = K \times \left[\frac{GZ_{\max}}{TGZ_{\max}} \times \frac{Range}{TRange}\right]^{\frac{1}{4}}$$

where:

GZ_{max} is not to be taken as more than TGZ_{max};

Range is not to be taken as more than *TRange*;

TGZ_{max} = 0.20 m, for ro-ro passenger ships each damage case that involves a ro-ro space,

TGZ_{max} = 0.12 m, otherwise;

TRange = 20º, for ro-ro passenger ships each damage case that involves a ro-ro space,

TRange = 16º, otherwise;

$K = 1$ if $\theta_e \leq \theta_{min}$

$K = 0$ if $\theta_e \geq \theta_{max}$

$$K = \sqrt{\frac{\theta_{\max} - \theta_e}{\theta_{\max} - \theta_{\min}}} \text{ otherwise,}$$

where:

θ_{min} is 7° for passenger ships and 25° for cargo ships; and

θ_{max} is 15° for passenger ships and 30° for cargo ships.

4 The factor $s_{mom,i}$ is applicable only to passenger ships (for cargo ships $s_{mom,i}$ shall be taken as unity) and shall be calculated at the final equilibrium from the formula:

$$S_{\text{mom},i} = \frac{(GZ_{\max} - 0.04) \times Displacement}{M_{\text{heel}}}$$

where:

Displacement is the intact displacement at the respective draught (d_s, d_p or d_l).

M_{heel} is the maximum assumed heeling moment as calculated in accordance with subparagraph 4.1; and

$s_{mom,i} \leq 1$

4.1 The heeling moment M_{heel} is to be calculated as follows:

M_{heel} = maximum ($M_{passenger}$ or M_{wind} or $M_{survivalcraft}$)

4.1.1 $M_{passenger}$ is the maximum assumed heeling moment resulting from movement of passengers, and is to be obtained as follows:

$M_{passenger} = (0.075 \times N_p) \times (0.45 \times B)$ (tm)

where:

N_p is the maximum number of passengers permitted to be on board in the service condition corresponding to the deepest subdivision draught under consideration; and

B is the breadth of the ship as defined in regulation 2.8.

Alternatively, the heeling moment may be calculated assuming the passengers are distributed with 4 persons per square metre on available deck areas towards one side of the ship on the decks where muster stations are located and in such a way that they produce the most adverse heeling moment. In doing so, a weight of 75 kg per passenger is to be assumed.

4.1.2 M_{wind} is the maximum assumed wind moment acting in a damage situation:

$M_{wind} = (P \times A \times Z) / 9{,}806$ (tm)

where:

P = 120 N/m^2;

A = projected lateral area above waterline;

Z = distance from centre of lateral projected area above waterline to $T/2$; and

T = respective draught (d_s, d_p or d_l)."

27 The existing paragraph 5 is replaced with the following:

"5 Unsymmetrical flooding is to be kept to a minimum consistent with the efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to equalization devices are provided they shall be operable from above the bulkhead deck of passenger ships and the freeboard deck of cargo ships. These fittings together with their controls shall be acceptable to the Administration*. Suitable information concerning the use of equalization devices shall be supplied to the master of the ship.

* Reference is made to the *Revised recommendation on a standard method for evaluating cross-flooding arrangements*, adopted by the Organization by resolution MSC.362(92), as may be amended."

28 The existing chapeau of paragraph 5.2 is replaced with the following:

"5.2 The factor s_i is to be taken as zero in those cases where the final waterline, taking into account sinkage, heel and trim, immerses:"

29 The existing paragraph 5.3 is replaced with the following:

"5.3 The factor s_i is to be taken as zero if, taking into account sinkage, heel and trim, any of the following occur in any intermediate stage or in the final stage of flooding:

.1 immersion of any vertical escape hatch in the bulkhead deck of passenger ships and the freeboard deck of cargo ships intended for compliance with chapter II-2;

.2 any controls intended for the operation of watertight doors, equalization devices, valves on piping or on ventilation ducts intended to maintain the integrity of watertight bulkheads from above the bulkhead deck of passenger ships and the freeboard deck of cargo ships become inaccessible or inoperable; and

.3 immersion of any part of piping or ventilation ducts located within the assumed extent of damage and carried through a watertight boundary if this can lead to the progressive flooding of compartments not assumed as flooded."

30 The existing paragraph 5.5 is replaced with the following:

"5.5 Except as provided in paragraph 5.3.1, openings closed by means of watertight manhole covers and flush scuttles, remotely operated sliding watertight doors, sidescuttles of the non-opening type as well as watertight access doors and watertight hatch covers required to be kept closed at sea need not be considered."

Regulation 8 – Special requirements concerning passenger ship stability

31 The existing paragraphs 1 and 2, and the chapeau of paragraph 3 are replaced with the following:

"1 A passenger ship intended to carry 400 or more persons shall have watertight subdivision abaft the collision bulkhead so that $s_i = 1$ for a damage involving all the compartments within 0.08*L* measured from the forward perpendicular for the three loading conditions used to calculate the attained subdivision index *A*. If the attained subdivision index *A* is calculated for different trims, this requirement shall also be satisfied for those loading conditions.

2 A passenger ship intended to carry 36 or more persons is to be capable of withstanding damage along the side shell to an extent specified in paragraph 3. Compliance with this regulation is to be achieved by demonstrating that s_i, as defined in regulation 7-2, is not less than 0.9 for the three loading conditions used to calculate the attained subdivision index *A*. If the attained subdivision index *A* is calculated for different trims, this requirement shall also be satisfied for those loading conditions.

3 The damage extent to be assumed when demonstrating compliance with paragraph 2, is to be dependent on the total number of persons carried, and *L,* such that:"

32 The existing paragraph 3.2 is replaced with the following:

".2 where 400 or more persons are to be carried, a damage length of 0.03*L*, but not less than 3 m is to be assumed at any position along the side shell, in conjunction with a penetration inboard of 0.1*B* but not less than 0.75 m measured inboard from the ship side, at right angles to the centreline at the level of the deepest subdivision draught;"

33 The existing paragraph 3.4 is replaced with the following:

".4 where 36 persons are carried, a damage length of 0.015*L* but not less than 3 m is to be assumed, in conjunction with a penetration inboard of 0.05*B* but not less than 0.75 m; and"

Regulation 8-1 – System capabilities and operational information after a flooding casualty on passenger ships

2 Availability of essential systems in case of flooding damage

34 The existing text is replaced with the following:

"A passenger ship shall be designed so that the systems specified in regulation II-2/21.4 remain operational when the ship is subject to flooding of any single watertight compartment."

3 Operational information after a flooding casualty

35 The text of the existing chapeau is replaced with the following:

"For the purpose of providing operational information to the Master for safe return to port after a flooding casualty, passenger ships shall have:"

36 The existing footnote to the regulation is replaced with the following:

"* Refer to the *Guidelines on operational information for masters of passenger ships for safe return to port by own power or under tow* (MSC.1/Circ.1400) and the *Revised guidelines on operational information for masters of passenger ships for safe return to port* (MSC.1/Circ.1532)."

PART B-2
SUBDIVISION, WATERTIGHT AND WEATHERTIGHT INTEGRITY

Regulation 9 – Double bottoms in passenger ships and cargo ships other than tankers

37 The existing paragraph 3 is replaced with the following:

"3.1 Small wells constructed in the double bottom in connection with drainage arrangements shall not extend downward more than necessary. The vertical distance from the bottom of such a well to a plane coinciding with the keel line shall not be less than *h*/2 or 500 mm, whichever is greater, or compliance with paragraph 8 of this regulation shall be shown for that part of the ship.

3.2 Other wells (e.g. for lubricating oil under main engines) may be permitted by the Administration if satisfied that the arrangements give protection equivalent to that afforded by a double bottom complying with this regulation.

3.2.1 For a cargo ship of 80 m in length and upwards or for a passenger ship, proof of equivalent protection is to be shown by demonstrating that the ship is capable of withstanding bottom damages as specified in paragraph 8. Alternatively, wells for lubricating oil below main engines may protrude into the double bottom below the boundary line defined by the distance *h* provided that the vertical distance between the well bottom and a plane coinciding with the keel line is not less than *h*/2 or 500 mm, whichever is greater.

3.2.2 For cargo ships of less than 80 m in length the arrangements shall provide a level of safety to the satisfaction of the Administration."

38 The existing paragraphs 6 to 8 are replaced with the following:

"6 Any part of a cargo ship of 80 m in length and upwards or of a passenger ship that is not fitted with a double bottom in accordance with paragraphs 1, 4 or 5, as specified in paragraph 2, shall be capable of withstanding bottom damages, as specified in paragraph 8, in that part of the ship. For cargo ships of less than 80 m in length the alternative arrangements shall provide a level of safety to the satisfaction of the Administration.

7 In the case of unusual bottom arrangements in a cargo ship of 80 m in length and upwards or a passenger ship, it shall be demonstrated that the ship is capable of withstanding bottom damages as specified in paragraph 8. For cargo ships of less than 80 m in length the alternative arrangements shall provide a level of safety to the satisfaction of the Administration.

8 Compliance with paragraphs 3.1, 3.2.1, 6 or 7 is to be achieved by demonstrating that s_i, when calculated in accordance with regulation 7-2, is not less than 1 for all service conditions when subject to bottom damage with an extent specified in subparagraph .2 below for any position in the affected part of the ship:

.1 Flooding of such spaces shall not render emergency power and lighting, internal communication, signals or other emergency devices inoperable in other parts of the ship.

.2 Assumed extent of damage shall be as follows:

	For 0.3 *L* from the forward perpendicular of the ship	Any other part of the ship
Longitudinal extent	1/3 $L^{2/3}$ or 14.5 m, whichever is less	1/3 $L^{2/3}$ or 14.5 m, whichever is less
Transverse extent	*B*/6 or 10 m, whichever is less	*B*/6 or 5 m, whichever is less
Vertical extent, measured from the keel line	*B*/20, to be taken not less than 0.76 m and not more than 2 m	*B*/20, to be taken not less than 0.76 m and not more than 2 m

.3 If any damage of a lesser extent than the maximum damage specified in .2 would result in a more severe condition, such damage should be considered."

Regulation 10 – Construction of watertight bulkheads

39 The existing paragraph 1 is replaced with the following:

"1 Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed having scantlings as specified in regulation 2.17. In all cases, watertight subdivision bulkheads shall be capable of supporting at least the pressure due to a head of water up to the bulkhead deck of passenger ships and the freeboard deck of cargo ships."

Regulation 12 – Peak and machinery space bulkheads, shaft tunnels, etc.

40 The existing paragraph 1 is replaced with the following:

"1 A collision bulkhead shall be fitted which shall be watertight up to the bulkhead deck of passenger ships and the freeboard deck of cargo ships. This bulkhead shall be located at a distance from the forward perpendicular of not less than 0.05*L* or 10 m, whichever is the less, and, except as may be permitted by the Administration, not more than 0.08*L* or 0.05*L* + 3 m, whichever is the greater.

2 The ship shall be so designed that s_i calculated in accordance with regulation 7-2 will not be less than 1 at the deepest subdivision draught loading condition, level trim or any forward trim loading conditions, if any part of the ship forward of the collision bulkhead is flooded without vertical limits."

41 The existing paragraphs 2 to 10 are replaced with the following:

"3 Where any part of the ship below the waterline extends forward of the forward perpendicular, e.g. a bulbous bow, the distances stipulated in paragraph 1 shall be measured from a point either:

.1 at the mid-length of such extension;

.2 at a distance 0.015*L* forward of the forward perpendicular; or

.3 at a distance 3 m forward of the forward perpendicular,

whichever gives the smallest measurement.

4 The bulkhead may have steps or recesses provided they are within the limits prescribed in paragraph 1 or 3.

5 No doors, manholes, access openings, ventilation ducts or any other openings shall be fitted in the collision bulkhead below the bulkhead deck of passenger ships and the freeboard deck of cargo ships.

6.1 Except as provided in paragraph 6.2, the collision bulkhead may be pierced below the bulkhead deck of passenger ships and the freeboard deck of cargo ships by not more than one pipe for dealing with fluid in the forepeak tank, provided that the pipe is fitted with a screw-down valve capable of being operated from above the bulkhead deck of passenger ships and the freeboard deck of cargo ships, the valve being located inside the forepeak at the collision bulkhead. The Administration may, however, authorize the fitting of this valve on the after side of the collision bulkhead provided that

the valve is readily accessible under all service conditions and the space in which it is located is not a cargo space. Alternatively, for cargo ships, the pipe may be fitted with a butterfly valve suitably supported by a seat or flanges and capable of being operated from above the freeboard deck. All valves shall be of steel, bronze or other approved ductile material. Valves of ordinary cast iron or similar material are not acceptable.

6.2 If the forepeak is divided to hold two different kinds of liquids the Administration may allow the collision bulkhead to be pierced below the bulkhead deck of passenger ships and the freeboard deck of cargo ships by two pipes, each of which is fitted as required by paragraph 6.1, provided the Administration is satisfied that there is no practical alternative to the fitting of such a second pipe and that, having regard to the additional subdivision provided in the forepeak, the safety of the ship is maintained.

7 Where a long forward superstructure is fitted, the collision bulkhead shall be extended weathertight to the deck next above the bulkhead deck of passenger ships and the freeboard deck of cargo ships. The extension need not be fitted directly above the bulkhead below provided that all parts of the extension, including any part of the ramp attached to it are located within the limits prescribed in paragraph 1 or 3, with the exception permitted by paragraph 8 and that the part of the deck which forms the step is made effectively weathertight. The extension shall be so arranged as to preclude the possibility of the bow door or ramp, where fitted, causing damage to it in the case of damage to, or detachment of, a bow door or any part of the ramp.

8 Where bow doors are fitted and a sloping loading ramp forms part of the extension of the collision bulkhead above the bulkhead deck of passenger ships and the freeboard deck of cargo ships the ramp shall be weathertight over its complete length. In cargo ships the part of the ramp which is more than 2.3 m above the freeboard deck may extend forward of the limit specified in paragraph 1 or 3. Ramps not meeting the above requirements shall be disregarded as an extension of the collision bulkhead.

9 The number of openings in the extension of the collision bulkhead above the freeboard deck shall be restricted to the minimum compatible with the design and normal operation of the ship. All such openings shall be capable of being closed weathertight.

10 Bulkheads shall be fitted separating the machinery space from cargo and accommodation spaces forward and aft and made watertight up to the bulkhead deck of passenger ships and the freeboard deck of cargo ships. An afterpeak bulkhead shall also be fitted and made watertight up to the bulkhead deck or the freeboard deck. The afterpeak bulkhead may, however, be stepped below the bulkhead deck or the freeboard deck, provided the degree of safety of the ship as regards subdivision is not thereby diminished.

11 In all cases stern tubes shall be enclosed in watertight spaces of moderate volume. In passenger ships the stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the bulkhead deck will not be immersed. In cargo ships other measures to minimize the danger of water penetrating into the ship in case of damage to stern tube arrangements may be taken at the discretion of the Administration."

Regulation 13 – Openings in watertight bulkheads below the bulkhead deck in passenger ships

42 The existing paragraph 11.1 is replaced with the following:

"11.1 Where trunkways or tunnels for access from crew accommodation to the machinery spaces, for piping, or for any other purpose are carried through watertight bulkheads, they shall be watertight and in accordance with the requirements of regulation 16-1. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the bulkhead deck. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead."

Regulation 15 – Openings in the shell plating below the bulkhead deck of passenger ships and the freeboard deck of cargo ships

43 The existing paragraphs 4 and 5.1 are replaced with the following:

"4 Efficient hinged inside deadlights so arranged that they can be easily and effectively closed and secured watertight, shall be fitted to all sidescuttles except that abaft one eighth of the ship's length from the forward perpendicular and above a line drawn parallel to the bulkhead deck at side and having its lowest point at a height of 3.7 m plus 2.5% of the breadth of the ship above the deepest subdivision draught, the deadlights may be portable in passenger accommodation, unless the deadlights are required by the International Convention on Load Lines in force to be permanently attached in their proper positions. Such portable deadlights shall be stowed adjacent to the sidescuttles they serve.

5.1 No sidescuttles shall be fitted in any spaces which are appropriated exclusively to the carriage of cargo."

44 The existing paragraph 8.2.1 is replaced with the following:

"8.2.1 Subject to the requirements of the International Convention on Load Lines in force, and except as provided in paragraph 8.3, each separate discharge led through the shell plating from spaces below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be provided with either one automatic non-return valve fitted with a positive means of closing it from above the bulkhead deck of passenger ships and the freeboard deck of cargo ships or with two automatic non-return valves without positive means of closing, provided that the inboard valve is situated above the deepest subdivision draught and is always accessible for examination under service conditions. Where a valve with positive means of closing is fitted, the operating position above the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall always be readily accessible and means shall be provided for indicating whether the valve is open or closed."

45 The existing paragraph 8.4 is replaced with the following:

"8.4 Moving parts penetrating the shell plating below the deepest subdivision draught shall be fitted with a watertight sealing arrangement acceptable to the Administration. The inboard gland shall be located within a watertight space of such volume that, if flooded, the bulkhead deck of passenger ships and the freeboard

deck of cargo ships will not be submerged. The Administration may require that if such compartment is flooded, essential or emergency power and lighting, internal communication, signals or other emergency devices must remain available in other parts of the ship."

Regulation 16 – Construction and initial tests of watertight doors, sidescuttles, etc.

46 The title of the regulation is replaced with the following:

"**Regulation 16 – Construction and initial tests of watertight closures**"

47 The existing paragraphs 1 and 2 are replaced with the following:

"1.1 The design, materials and construction of all watertight closures such as doors, hatches, sidescuttles, gangway and cargo ports, valves, pipes, ash-chutes and rubbish-chutes referred to in these regulations shall be to the satisfaction of the Administration.

1.2 Such valves, doors, hatches and mechanisms shall be suitably marked to ensure that they may be properly used to provide maximum safety.

1.3 The frames of vertical watertight doors shall have no groove at the bottom in which dirt might lodge and prevent the door closing properly.

2 Watertight doors and hatches shall be tested by water pressure to the maximum head of water they might sustain in a final or intermediate stage of flooding. For cargo ships not covered by damage stability requirements, watertight doors and hatches shall be tested by water pressure to a head of water measured from the lower edge of the opening to one metre above the freeboard deck. Where testing of individual doors and hatches is not carried out because of possible damage to insulation or outfitting items, testing of individual doors and hatches may be replaced by a prototype pressure test of each type and size of door or hatch with a test pressure corresponding at least to the head required for the individual location. The prototype test shall be carried out before the door or hatch is fitted. The installation method and procedure for fitting the door or hatch on board shall correspond to that of the prototype test. When fitted on board, each door or hatch shall be checked for proper seating between the bulkhead, the frame and the door or between deck, the coaming and the hatch."

Regulation 16-1 – Construction and initial tests of watertight decks, trunks, etc.

48 The existing paragraphs 2 and 3 are replaced with the following:

"2 In passenger ships, where a ventilation trunk passing through a structure penetrates a watertight area of the bulkhead deck, the trunk shall be capable of withstanding the water pressure that may be present within the trunk, after having taken into account the maximum heel angle during flooding, in accordance with regulation 7-2.

3 In ro-ro passenger ships, where all or part of the penetration of the bulkhead deck is on the main ro-ro deck, the trunk shall be capable of withstanding impact pressure due to internal water motions (sloshing) of water trapped on the ro-ro deck."

Regulation 17 – Internal watertight integrity of passenger ships above the bulkhead deck

49 The existing paragraph 3 is replaced with the following:

"3 Air pipes terminating within a superstructure which are not fitted with watertight means of closure shall be considered as unprotected openings when applying regulation 7-2.6.1.1."

PART B-4
STABILITY MANAGEMENT

Regulation 19 – Damage control information

50 The existing paragraph 2 is deleted and the remaining paragraphs are renumbered accordingly.

51 The following new regulation 19-1 is introduced after the existing regulation 19:

"**Regulation 19-1 – Damage control drills for passenger ships**

1 This regulation applies to passenger ships constructed before, on or after 1 January 2020.

2 A damage control drill shall take place at least every three months. The entire crew need not participate in every drill, but only those crew members with damage control responsibilities.

3 The damage control drill scenarios shall vary each drill so that emergency conditions are simulated for different damage conditions and shall, as far as practicable, be conducted as if there were an actual emergency.

4 Each damage control drill shall include:

.1 for crew members with damage control responsibilities, reporting to stations and preparing for the duties described in the muster list required by regulation III/8;

.2 use of the damage control information and the on board damage stability computer, if fitted, to conduct stability assessments for the simulated damage conditions;

.3 establishment of the communications link between the ship and shore-based support, if provided;

.4 operation of watertight doors and other watertight closures;

.5 demonstrating proficiency in the use of the flooding detection system, if fitted, in accordance with muster list duties;

.6 demonstrating proficiency in the use of cross-flooding and equalization systems, if fitted, in accordance with muster list duties;

.7 operation of bilge pumps and checking of bilge alarms and automatic bilge pump starting systems; and

.8 instruction in damage survey and use of the ship's damage control systems.

5 At least one damage control drill each year shall include activation of the shore-based support, if provided in compliance with regulation II-1/8-1.3, to conduct stability assessments for the simulated damage conditions.

6 Every crew member with assigned damage control responsibilities shall be familiarized with their duties and about the damage control information before the voyage begins.

7 A record of each damage control drill shall be maintained in the same manner as prescribed for the other drills in regulation III/19.5."

52 The existing title and paragraph 1 of regulation 20 are replaced with the following:

"**Regulation 20 – Loading of ships**

1 On completion of loading of the ship and prior to its departure, the master shall determine the ship's trim and stability and also ascertain and record that the ship is upright and in compliance with stability criteria in relevant regulations. The determination of the ship's stability shall always be made by calculation or by ensuring that the ship is loaded according to one of the precalculated loading conditions within the approved stability information. The Administration may accept the use of an electronic loading and stability computer or equivalent means for this purpose."

Regulation 21 – Periodical operation and inspection of watertight doors, etc. in passenger ships

53 The existing paragraph 1 is replaced with the following:

"1 Operational tests of watertight doors, sidescuttles, valves and closing mechanisms of scuppers, ash-chutes and rubbish-chutes shall take place weekly. In ships in which the voyage exceeds one week in duration a complete set of operational tests shall be held before the voyage commences, and others thereafter at least once a week during the voyage."

54 The existing paragraph 4 is replaced with the following:

"4 A record of all operational tests and inspections required by this regulation shall be recorded in the logbook with an explicit record of any defects which may be disclosed."

Regulation 22 – Prevention and control of water ingress, etc.

55 In the existing paragraph 1, at the end of the first sentence, the words "paragraphs 3 and 4" are replaced with "paragraph 3".

56 The existing paragraph 2 is replaced with the following:

"2 Watertight doors located below the bulkhead deck of passenger ships and the freeboard deck of cargo ships having a maximum clear opening width of more than 1.2 m shall be kept closed during navigation, except for limited periods when absolutely necessary as determined by the Administration."

57 The existing paragraph 3 is replaced with the following:

"3 A watertight door may be opened during navigation to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door must be immediately closed when transit through the door is complete or when the task which necessitated it being open is finished. The Administration shall authorize that such a watertight door may be opened during navigation only after careful consideration of the impact on ship operations and survivability taking into account guidance issued by the Organization*. A watertight door permitted to be opened during navigation shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed.

* Refer to the *Revised guidance for watertight doors on passenger ships which may be opened during navigation* (MSC.1/Circ.1564)."

58 The existing paragraphs 4 to 8 are replaced with the following:

"4 Portable plates on bulkheads shall always be in place before the voyage commences, and shall not be removed during navigation except in case of urgent necessity at the discretion of the master. The necessary precautions shall be taken in replacing them to ensure that the joints are watertight. Power-operated sliding watertight doors permitted in machinery spaces in accordance with regulation 13.10 shall be closed before the voyage commences and shall remain closed during navigation except in case of urgent necessity at the discretion of the master.

5 Watertight doors fitted in watertight bulkheads dividing cargo between deck spaces in accordance with regulation 13.9.1 shall be closed before the voyage commences and shall be kept closed during navigation. The time at which such doors are opened or closed shall be recorded in such log-book as may be prescribed by the Administration.

6 Gangway, cargo and fuelling ports fitted below the bulkhead deck of passenger ships and the freeboard deck of cargo ships shall be effectively closed and secured watertight before voyage commences, and shall be kept closed during navigation.

7 The following doors, located above the bulkhead deck of passenger ships and the freeboard deck of cargo ships, shall be closed and locked before the voyage commences and shall remain closed and locked until the ship is at its next berth:

.1 cargo loading doors in the shell or the boundaries of enclosed superstructures;

.2 bow visors fitted in positions as indicated in paragraph 7.1;

.3 cargo loading doors in the collision bulkhead; and

.4 ramps forming an alternative closure to those defined in paragraphs 7.1 to 7.3 inclusive."

59 The existing paragraph 9 is renumbered as paragraph 8, and the existing paragraphs 10 to 16 are replaced with the following:

"9 Notwithstanding the requirements of paragraphs 7.1 and 7.4, the Administration may authorize that particular doors can be opened at the discretion of the master, if necessary for the operation of the ship or the embarking and disembarking of passengers when the ship is at safe anchorage and provided that the safety of the ship is not impaired.

10 The master shall ensure that an effective system of supervision and reporting of the closing and opening of the doors referred to in paragraph 7 is implemented.

11 The master shall ensure, before any voyage commences, that an entry in such log-book as may be prescribed by the Administration is made of the time the doors specified in paragraph 12 are closed and the time at which particular doors are opened in accordance with paragraph 13.

12 Hinged doors, portable plates, sidescuttles, gangway, cargo and bunkering ports and other openings, which are required by these regulations to be kept closed during navigation, shall be closed before the voyage commences. The time at which such doors are opened and closed (if permissible under these regulations) shall be recorded in such log-book as may be prescribed by the Administration.

13 Where in a between-deck, the sills of any of the sidescuttles referred to in regulation 15.3.2 are below a line drawn parallel to the bulkhead deck at side of passenger ships and the freeboard deck at side of cargo ships, and having its lowest point 1.4 m plus 2.5% of the breadth of the ship above the water when the voyage commences, all the sidescuttles in that between-deck shall be closed watertight and locked before the voyage commences, and they shall not be opened before the ship arrives at the next port. In the application of this paragraph the appropriate allowance for fresh water may be made when applicable.

.1 The time at which such sidescuttles are opened in port and closed and locked before the voyage commences shall be recorded in such log-book as may be prescribed by the Administration.

.2 For any ship that has one or more sidescuttles so placed that the requirements of paragraph 13 would apply when it was floating at its deepest subdivision draught, the Administration may indicate the limiting mean draught at which these sidescuttles will have their sills above the line drawn parallel to the bulkhead deck at side of passenger ships and the freeboard deck at side of cargo ships, and having its lowest point 1.4 m plus 2.5% of the breadth of the ship above the waterline corresponding to the limiting mean draught, and at which it will therefore be permissible for the voyage to commence without them being closed and locked and to be opened during navigation on the responsibility of the master during navigation. In tropical zones as defined in the International Convention on Load Lines in force, this limiting draught may be increased by 0.3 m.

14 Sidescuttles and their deadlights which will not be accessible during navigation shall be closed and secured before the voyage commences.

15 If cargo is carried in spaces referred to in regulation 15.5.2, the sidescuttles and their deadlights shall be closed watertight and locked before the cargo is shipped and the time at which such scuttles and deadlights are closed and locked shall be recorded in such log-book as may be prescribed by the Administration."

60 The existing paragraph 17 is renumbered as paragraph 16.

Regulation 22-1 – Flooding detection systems for passenger ships carrying 36 or more persons constructed on or after 1 July 2010

61 In regulation 22-1, the words "constructed on or after 1 July 2010" are removed from the end of the existing title.

Regulation 23 – Special requirements for ro-ro passenger ships

62 The existing text of this regulation is replaced with the following:

"1 Special category spaces and ro-ro spaces shall be continuously patrolled or monitored by effective means, such as television surveillance, so that any movement of vehicles in adverse weather conditions and unauthorized access by passengers thereto can be detected during navigation.

2 Documented operating procedures for closing and securing all shell doors, loading doors and other closing appliances which, if left open or not properly secured, could, in the opinion of the Administration, lead to flooding of a special category space or ro-ro space, shall be kept on board and posted at an appropriate place.

3 All accesses from the ro-ro deck and vehicle ramps that lead to spaces below the bulkhead deck shall be closed before the voyage commences and shall remain closed until the ship is at its next berth.

4 The master shall ensure that an effective system of supervision and reporting of the closing and opening of such accesses referred to in paragraph 3 is implemented.

5 The master shall ensure, before the voyage commences, that an entry in the log-book, as required by regulation 22.12, is made of the time of the last closing of the accesses referred to in paragraph 3.

6 Notwithstanding the requirements of paragraph 3, the Administration may permit some accesses to be opened during the voyage, but only for a period sufficient to permit through passage and, if required, for the essential working of the ship.

7 All transverse or longitudinal bulkheads which are taken into account as effective to confine the seawater accumulated on the ro-ro deck shall be in place and secured before the voyage commences and remain in place and secured until the ship is at its next berth.

8 Notwithstanding the requirements of paragraph 7, the Administration may permit some accesses within such bulkheads to be opened during the voyage but only for sufficient time to permit through passage and, if required, for the essential working of the ship.

9 In all ro-ro passenger ships, the master or the designated officer shall ensure that, without the expressed consent of the master or the designated officer, no passengers are allowed access to an enclosed ro-ro deck during navigation."

63 In regulation 24, the existing title and paragraph 1 are replaced with the following:

"**Regulation 24 – Additional requirements for prevention and control of water ingress, etc. in cargo ships**

1 Openings in the shell plating below the deck limiting the vertical extent of damage shall be kept permanently closed during navigation."

64 The existing paragraph 3 is replaced with the following:

"3 Watertight doors or ramps fitted to internally subdivide large cargo spaces shall be closed before the voyage commences and shall be kept closed during navigation. The time at which such doors are opened or closed shall be recorded in such log-book as may be prescribed by the Administration."

PART C
MACHINERY INSTALLATIONS

Regulation 35-1 – Bilge pumping arrangements

65 The following new sentence is added at the end of the existing paragraph 2.6:

"For ships subject to the provisions of regulation II-1/1.1.1.1, for the special hazards associated with loss of stability when fitted with fixed pressure water-spraying fire-extinguishing systems refer to regulation II-2/20.6.1.4."

66 In paragraph 3.2, the existing text of the whole volume of the passenger and crew spaces below the bulkhead deck *P* is replaced with the following:

"*P* = the whole volume of the passenger and crew spaces below the bulkhead deck (cubic metres), which are provided for the accommodation and use of passengers and crew, excluding baggage, store and provision rooms;"

67 In paragraph 3.4, the existing chapeau is replaced with the following:

"3.4 On a ship of 91.5 m in length *L* and upwards or having a bilge pump numeral, calculated in accordance with paragraph 3.2, of 30 or more, the arrangements shall be such that at least one power bilge pump shall be available for use in all flooding conditions which the ship is required to withstand, and, for ships subject to the provisions of regulation II-1/1.1.1.1, in all flooding conditions derived from consideration of minor damages as specified in regulation 8 as follows:"

68 The following new sentence is added at the end of the existing paragraph 3.10:

"For ships subject to the provisions of regulation II-1/1.1.1.1, the deepest subdivision load line shall be taken as the deepest subdivision draught."

CHAPTER II-2
CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

PART A
GENERAL

Regulation 3 – Definitions

69 Regulation II-2/3.56 is replaced as follows:

"56 Vehicle carrier means a cargo ship which only carries cargo in ro-ro spaces or vehicle spaces, and which is designed for the carriage of unoccupied motor vehicles without cargo, as cargo."

PART C
SUPPRESSION OF FIRE

Regulation 9 – Containment of fire

70 The following new paragraphs 4.1.3.4 to 4.1.3.6 are added after the existing paragraph 4.1.3.3:

"4.1.3.4 Notwithstanding the requirement in paragraph 4.1.3.3, the requirements in paragraphs 4.1.3.5 and 4.1.3.6 shall apply to ships constructed on or after 1 January 2020.

4.1.3.5 For ships carrying more than 36 passengers, windows facing survival craft, embarkation and assembly stations, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have fire integrity as required in table 9.1. Where automatic dedicated sprinkler heads are provided for windows, "A-0" windows may be accepted as equivalent. To be considered under this paragraph, the sprinkler heads must either be:

.1 dedicated heads located above the windows, and installed in addition to the conventional ceiling sprinklers; or

.2 conventional ceiling sprinkler heads arranged such that the window is protected by an average application rate of at least 5 l/min per square metre and the additional window area is included in the calculation of the area of coverage; or

.3 water-mist nozzles that have been tested and approved in accordance with the Guidelines approved by the Organization*; and

Windows located in the ship's side below the lifeboat embarkation area shall have fire integrity at least equal to "A-0" class.

4.1.3.6 For ships carrying not more than 36 passengers, windows facing survival craft and escape slide, embarkation areas and windows situated below such areas shall have fire integrity at least equal to "A-0" class.

---

* Refer to the *Revised guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12* (resolution A.800(19), as amended)."

PART G

SPECIAL REQUIREMENTS

Regulation 20 – Protection of vehicle, special category and ro-ro spaces

71 The existing paragraph under 2.1 is numbered as 2.1.1, the following paragraph 2.1.2 is added after the paragraph 2.1.1:

"2.1.2 On all ships, vehicles with fuel in their tanks for their own propulsion may be carried in cargo spaces other than vehicle, special category or ro-ro spaces, provided that all the following conditions are met:

.1 the vehicles do not use their own propulsion within the cargo spaces;

.2 the cargo spaces are in compliance with the appropriate requirements of regulation 19; and

.3 the vehicles are carried in accordance with the IMDG Code, as defined in regulation VII/1.1."

Regulation 20-1 – Requirements for vehicle carriers carrying motor vehicles with compressed hydrogen or natural gas in their tanks for their own propulsion as cargo

72 The existing paragraph 2.1 is replaced with the following:

"2.1 In addition to complying with the requirements of regulation 20, as appropriate, vehicle carriers constructed on or after 1 January 2016 intended for the carriage of motor vehicles with compressed hydrogen or compressed natural gas in their tanks for their own propulsion as cargo shall comply with the requirements in paragraphs 3 to 5 of this regulation."

CHAPTER III
LIFE-SAVING APPLIANCES AND ARRANGEMENTS

PART A
GENERAL

Regulation 1 – Application

73 The existing paragraph 4 is replaced with the following:

"4 For ships constructed before 1 July 1998, the Administration shall:

.1 ensure that, subject to the provisions of paragraph 4.2, the requirements which are applicable under chapter III of the International Convention for the Safety of Life at Sea, 1974, in force prior to 1 July 1998 to new or existing ships as prescribed by that chapter are complied with;

.2 ensure that when life-saving appliances or arrangements on such ships are replaced or such ships undergo repairs, alterations or modifications of a major character which involve replacement of, or any addition to, their existing life-saving appliances or arrangements, such life-saving appliances or arrangements, in so far as is reasonable and practicable, comply with the requirements of this chapter. However, if a survival craft other than an inflatable liferaft is replaced without replacing its launching appliance, or vice versa, the survival craft or launching appliance may be of the same type as that replaced; and

.3 ensure that the requirements of regulations 30.3 and 37.3.9 are complied with."

PART B
REQUIREMENTS FOR SHIPS AND LIFE-SAVING APPLIANCES

Regulation 30 – Drills

74 The following new paragraph 3 is added after the existing paragraph 2:

"3 Damage control drills shall be conducted as required in regulation II-1/19-1."

Regulation 37 – Muster list and emergency instructions

75 In paragraph 3, the existing sub-paragraphs .7 and .8 are replaced with the following:

".7 manning of fire parties assigned to deal with fires;

.8 special duties assigned in respect to the use of fire-fighting equipment and installations; and

.9 for passenger ships only, damage control for flooding emergencies."

APPENDIX

CERTIFICATES

RECORD OF EQUIPMENT FOR PASSENGER SHIP SAFETY (FORM P)

76 In part 5, the existing item 3.1 is replaced by the following:

"3.1 Receiver for a global navigation satellite system/terrestrial radionavigation system/multi-system shipborne radionavigation receiver[3,4]"

RECORD OF EQUIPMENT FOR CARGO SHIP SAFETY (FORM E)

77 In part 3, the existing item 3.1 is replaced by the following:

"3.1 Receiver for a global navigation satellite system/terrestrial radionavigation system/multi-system shipborne radionavigation receiver[2,3]"

RECORD OF EQUIPMENT FOR CARGO SHIP SAFETY (FORM C)

78 In part 5, the existing item 3.1 is replaced by the following:

"3.1 Receiver for a global navigation satellite system/terrestrial radionavigation system/multi-system shipborne radionavigation receiver[2,3]"

***

ANNEX 4

RESOLUTION MSC.422(98)
(adopted on 15 June 2017)

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR SHIPS USING GASES OR OTHER LOW-FLASHPOINT FUELS (IGF CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.391(95), by which it adopted the International Code of Safety for Ships using Gases or other Low-flashpoint Fuels ("the IGF Code"), which has become mandatory under chapters II-1 and II-2 of the International Convention for the Safety of Life at Sea, 1974 ("the Convention"),

NOTING ALSO article VIII(b) and regulation II-1/2.29 of the Convention concerning the procedure for amending the IGF Code,

HAVING CONSIDERED, at its ninety-eighth session, amendments to the IGF Code proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IGF Code, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 July 2019 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purpose of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5 REQUESTS ALSO the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR SHIPS USING GASES OR OTHER LOW-FLASHPOINT FUELS (IGF CODE)

CHAPTER 11
FIRE SAFETY

11.3 Regulations for fire protection

1 In paragraph 11.3.2, the words ", and any boundaries above that, including navigation bridge windows, shall have A-0 class divisions" are deleted.

***

ANNEX 5

RESOLUTION MSC.423(98)
(adopted on 15 June 2017)

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 1994 (1994 HSC CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.36(63), by which it adopted the International Code of Safety for High-Speed Craft ("the 1994 HSC Code"), which has become mandatory under chapter X of the International Convention for the Safety of Life at Sea, 1974 ("the Convention"),

NOTING ALSO article VIII(b) and regulation X/1.1 of the Convention concerning the procedure for amending the 1994 HSC Code,

HAVING CONSIDERED, at its ninety-eighth session, amendments to the 1994 HSC Code proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the 1994 HSC Code, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that said amendments shall be deemed to have been accepted on 1 July 2019 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 % of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of Article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5 REQUESTS ALSO the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 1994 (1994 HSC CODE)

Chapter 8
Life-saving appliances and arrangements

8.10 Survival craft and rescue boats

1 Paragraphs 8.10.1.5 and 8.10.1.6 are replaced with the following:

".5 notwithstanding the provision of .4 above, craft should carry sufficient rescue boats to ensure that, in providing for abandonment by the total number of persons the craft is certified to carry:

.5.1 not more than nine of the liferafts provided in accordance with 8.10.1.1 are marshalled by each rescue boat; or

.5.2 if the Administration is satisfied that the rescue boats are capable of towing a pair of such liferafts simultaneously, not more than 12 of the liferafts provided in accordance with 8.10.1.1 are marshalled by each rescue boat; and

.5.3 the craft can be evacuated within the time specified in 4.8.

.6 craft of less than 20 m in length may be exempted from carrying a rescue boat, provided the craft meets all of the following requirements:

.6.1 the craft is arranged to allow a helpless person to be recovered from the water in a horizontal or near-horizontal body position;

.6.2 recovery of the helpless person can be observed from the navigating bridge; and

.6.3 the craft is sufficiently manoeuvrable to close in and recover persons in the worst intended conditions."

***

ANNEX 6

RESOLUTION MSC.424(98)
(adopted on 15 June 2017)

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 2000 (2000 HSC CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.97(73), by which it adopted the International Code of Safety for High-Speed Craft, 2000 ("the 2000 HSC Code"), which has become mandatory under chapter X of the International Convention for the Safety of Life at Sea (SOLAS), 1974 ("the Convention"),

NOTING ALSO article VIII(b) and regulation X/1.2 of the Convention concerning the procedure for amending the 2000 HSC Code,

HAVING CONSIDERED, at its ninety-eighth session, amendments to the 2000 HSC Code proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the 2000 HSC Code, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that said amendments shall be deemed to have been accepted on 1 July 2019 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified the Secretary-General of their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of Article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5 REQUESTS ALSO the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CODE OF SAFETY FOR HIGH-SPEED CRAFT, 2000 (2000 HSC CODE)

Chapter 8
Life-saving appliances and arrangements

8.10 Survival craft and rescue boats

1 Paragraphs 8.10.1.5 and 8.10.1.6 are replaced with the following:

".5 notwithstanding the provision of .4 above, craft shall carry sufficient rescue boats to ensure that, in providing for abandonment by the total number of persons the craft is certified to carry:

.5.1 not more than nine of the liferafts provided in accordance with 8.10.1.1 are marshalled by each rescue boat; or

.5.2 if the Administration is satisfied that the rescue boats are capable of towing a pair of such liferafts simultaneously, not more than 12 of the liferafts provided in accordance with 8.10.1.1 are marshalled by each rescue boat; and

.5.3 the craft can be evacuated within the time specified in 4.8.

.6 craft of less than 30 m in length may be exempted from carrying a rescue boat, provided the craft meets all of the following requirements:

.6.1 the craft is arranged to allow a helpless person to be recovered from the water in a horizontal or near-horizontal body position;

.6.2 recovery of the helpless person can be observed from the navigating bridge; and

.6.3 the craft is sufficiently manoeuvrable to close in and recover persons in the worst intended conditions."

***

ANNEX 7

RESOLUTION MSC.425(98)
(adopted on 15 June 2017)

AMENDMENTS TO THE INTERNATIONAL LIFE-SAVING APPLIANCE (LSA) CODE

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.48(66), by which it adopted the International Life-Saving Appliance (LSA) Code ("the LSA Code"), which has become mandatory under chapter III of the International Convention for the Safety of Life at Sea, 1974 ("the Convention"),

NOTING ALSO article VIII(b) and regulation III/3.10 of the Convention concerning the procedure for amending the LSA Code,

HAVING CONSIDERED, at its ninety-eighth session, amendments to the LSA Code proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the LSA Code, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that said amendments shall be deemed to have been accepted on 1 July 2019 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified the Secretary-General of their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

5 REQUESTS ALSO the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL LIFE-SAVING APPLIANCE (LSA) CODE

CHAPTER VI
LAUNCHING AND EMBARKATION APPLIANCES

6.1 Launching and embarkation appliances

1 Paragraphs 6.1.1.5 and 6.1.1.6 are replaced with the following:

"6.1.1.5 The launching appliance and its attachments other than winches shall be of sufficient strength to withstand a factory static proof load test of not less than 2.2 times the maximum working load.

6.1.1.6 Structural members and all blocks, falls, padeyes, links, fastenings and all other fittings used in connection with launching equipment shall be designed with a factor of safety on the basis of the maximum working load assigned and the ultimate strengths of the materials used for construction. A minimum factor of safety of 4.5 shall be applied to all structural members including winch structural components and a minimum factor of safety of 6 shall be applied to falls, suspension chains, links and blocks."

***

ANNEX 8

RESOLUTION MSC.426(98)
(adopted on 15 June 2017)

AMENDMENTS TO THE INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.268(85) by which it adopted the International Maritime Solid Bulk Cargoes Code ("the IMSBC Code"), which has become mandatory under chapter VI of the International Convention for the Safety of Life at Sea, 1974, as amended ("the Convention"),

NOTING ALSO article VIII(b) and regulation VI/1-1.1 of the Convention concerning the procedure for amending the IMSBC Code,

HAVING CONSIDERED, at its ninety-eighth session, amendments to the IMSBC Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IMSBC Code, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that said amendments shall be deemed to have been accepted on 1 July 2018 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified the Secretary-General of their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2019 upon their acceptance in accordance with paragraph 2 above;

4 AGREES that Contracting Governments to the Convention may apply the aforementioned amendments in whole or in part on a voluntary basis as from 1 January 2018;

5 REQUESTS the Secretary-General, for the purpose of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention; and

6 FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

Section 1
General provisions

1.4 Application and implementation of this Code

1 In paragraph 1.4.2, the words "Characteristics (other than CLASS and GROUP)" are replaced with the words "Characteristics (other than CLASS, SUBSIDIARY RISK and GROUP)". The words "Paragraph 4.2.2.2;" and "Section 14 Prevention of pollution by cargo residues from ships;" are deleted.

1.7 Definitions

2 In the definition for "*Bulk Cargo Shipping Name (BCSN)*", the third sentence is replaced with the following:

"When a cargo is dangerous goods as defined in the IMDG Code, as defined in regulation VII/1.1 of the SOLAS Convention, refer to 4.1.1."

Section 4
Assessment of acceptability of consignments for safe shipment

4.1 Identification and classification

3 The existing paragraph "4.1.1" is replaced with the following:

"4.1.1 Bulk Cargo Shipping Name

4.1.1.1 Each solid bulk cargo in this Code has been assigned a Bulk Cargo Shipping Name (BCSN). When a solid bulk cargo is carried by sea it shall be identified in the transport documentation by the BCSN.

4.1.1.2 Where the cargo is dangerous goods and not identified with a generic Proper Shipping Name, or not otherwise specified (N.O.S) in the IMDG Code, the BCSN shall consist of the Proper Shipping Name followed by the UN number.

4.1.1.3 Except for RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non-fissile or fissile – excepted UN 2912 and RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I), non-fissile or fissile – excepted UN 2913, where the cargo is dangerous goods identified with a generic Proper Shipping Name and/or not otherwise specified (N.O.S) in the IMDG Code, the BCSN shall consist of, in the following order:

.1 a chemical or technical name of the material;

.2 a specific description to identify the properties of the material; and

.3 the UN number."

4.2 Provision of information

4 The existing paragraph 4.2.2.1 is renumbered as "4.2.2".

5 In the renumbered paragraph 4.2.2, in sub-paragraph .15, the word "and" is deleted.

6 In the renumbered paragraph 4.2.2, a new sub-paragraph .16 is inserted as follows:

".16 whether or not the cargo is classified as harmful to the marine environment in accordance with Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended; and"

7 In the renumbered paragraph 4.2.2, the existing sub-paragraph .16 is renumbered as sub-paragraph .17.

8 Paragraph 4.2.2.2 "The cargo information should include whether or not the cargo is harmful to the marine environment*" and the corresponding footnote are deleted.

4.5 Interval between sampling/testing and loading for TML and moisture content determination

9 Replace the existing paragraphs 4.5.1 and 4.5.2 with the following:

"4.5.1 The shipper shall be responsible for ensuring that a test to determine the TML of a solid bulk cargo is conducted within six months to the date of loading the cargo. Notwithstanding this provision, where the composition or characteristics of the cargo are variable for any reason, the shipper shall be responsible for ensuring that a test to determine the TML is conducted again after it is reasonably assumed that such variation has taken place.

4.5.2 The shipper shall be responsible for ensuring that sampling and testing for moisture content is conducted as near as practicable to the date of commencement of loading. The interval between sampling/testing and the date of commencement of loading shall never be more than seven days. If the cargo has been exposed to significant rain or snow between the time of testing and the date of completion of loading, the shipper shall be responsible for ensuring that the moisture content of the cargo is still less than its TML, and evidence of this is provided to the master as soon as practicable."

Section 9
Materials possessing chemical hazards

9.3.3 Segregation between bulk materials possessing chemical hazards and dangerous goods in packaged form

10 In the segregation table as contained in paragraph 9.3.3, in the row of "Substances which, in contact with water, emit flammable gases", under the column "2.1", replace the number "1" with "2".

Section 13
References to related information and recommendations

13.2 Reference list

11 In section 13.2.7 "Minimum information/documentation", new rows are added at the end of section as follows:

4.2	MARPOL Annex V, regulation 4.3	*Discharge of garbage outside special areas*
4.2	MARPOL Annex V, regulation 6.1.2.2	*Discharge of garbage within special areas*

13.2.10 Segregation

12 Delete row "9.3.3".

13.2.11 Transport of solid wastes in bulk

13 In row "10.6", under the column "Reference to the relevant IMO instruments or standard (2)", replace the term "chapter 7.8.4" with "sub-section 2.0.5.4".

Section 14
Prevention of pollution by cargo residues from ships

14 Section 14 is deleted.

APPENDIX 1

Individual schedules of solid bulk cargoes

Amendments to existing individual schedules

ALUMINA

15 In the individual schedule for "ALUMINA", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ALUMINA, CALCINED

16 In the individual schedule for "ALUMINA, CALCINED", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ALUMINA HYDRATE

17 In the individual schedule for "ALUMINA HYDRATE", under the section for "Hazard", in the first sentence, add the word "a" before "moisture content"; in the second sentence, replace the words "of the Code" with the words "of this Code" and under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ALUMINA SILICA

18 In the individual schedule for "ALUMINA SILICA", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ALUMINA SILICA, pellets

19 In the individual schedule for "ALUMINA SILICA, pellets", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ALUMINIUM FERROSILICON POWDER UN 1395

20 In the individual schedule for "ALUMINIUM FERROSILICON POWDER UN 1395", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ALUMINIUM FLUORIDE

21 In the individual schedule for "ALUMINIUM FLUORIDE", under the section for "Weather precautions", the words "less than its TML during voyage" are replaced with the words "less than its TML during loading operations and the voyage".

ALUMINIUM NITRATE UN 1438

22 In the individual schedule for "ALUMINIUM NITRATE UN 1438 ", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ALUMINIUM SILICON POWDER, UNCOATED UN 1398

23 In the individual schedule for "ALUMINIUM SILICON POWDER, UNCOATED UN 1398", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

**ALUMINIUM SMELTING BY-PRODUCTS or
ALUMINIUM REMELTING BY-PRODUCTS UN 3170**

24 In the individual schedule for "ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS UN 3170", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ALUMINIUM SMELTING/REMELTING BY-PRODUCTS, PROCESSED

25 In the individual schedule for "ALUMINIUM SMELTING/REMELTING BY-PRODUCTS, PROCESSED", under the section for "Hazard", in the second sentence, add the word "a" before "moisture content"; in the third sentence, replace the words "of the Code" with the words "of this Code". Under the section for "Loading", replace the words "of the Code" with the words "of this Code". Under the section for "Clean-up", in the third sentence, replace the word "should" with "shall".

AMMONIUM NITRATE UN 1942

26 In the individual schedule for "AMMONIUM NITRATE UN 1942", under the section for "Loading", in the second sentence, replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

AMMONIUM NITRATE BASED FERTILIZER UN 2067

27 In the individual schedule for "AMMONIUM NITRATE BASED FERTILIZER UN 2067", under the section for "Loading", in the first sentence, replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

AMMONIUM NITRATE BASED FERTILIZER UN 2071

28 In the individual schedule for "AMMONIUM NITRATE BASED FERTILIZER UN 2071", under the section for "Loading", in the first sentence, replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

AMMONIUM NITRATE BASED FERTILIZER (non-hazardous)

29 In the individual schedule for "AMMONIUM NITRATE BASED FERTILIZER (non-hazardous)", under the section for "Stowage and segregation", in the first sentence, replace the word "should" with "shall". Under the section for "Loading", in the first sentence, replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

AMMONIUM SULPHATE

30 In the individual schedule for "AMMONIUM SULPHATE", under the section for "Loading", in the third sentence, replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

ANTIMONY ORE AND RESIDUE

31 In the individual schedule for "ANTIMONY ORE AND RESIDUE", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

BARIUM NITRATE UN 1446

32 In the individual schedule for "BARIUM NITRATE UN 1446", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

BARYTES

33 In the individual schedule for "BARYTES", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

BAUXITE

34 In the individual schedule for "BAUXITE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

BIOSLUDGE

35 In the individual schedule for "BIOSLUDGE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

BORAX (PENTAHYDRATE CRUDE)

36 In the individual schedule for "BORAX (PENTAHYDRATE CRUDE)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

BORAX, ANHYDROUS (crude or refined)

37 In the individual schedule for "BORAX, ANHYDROUS (crude or refined)", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

BROWN COAL BRIQUETTES

38 In the individual schedule for "BROWN COAL BRIQUETTES", in the appendix of the schedule, under the section for "Carriage", in 8.1, after the words "The company's", add "*" with the following footnote:

"* Refer to SOLAS regulation IX/1.2.";

and under the section for "Discharge", after the words "self-contained breathing apparatus", add "*" with the following footnote:

"* Refer to the *Revised recommendations for entering enclosed spaces aboard ships,* adopted by the Organization by resolution A.1050(27)."

CALCIUM NITRATE UN 1454

39 In the individual schedule for "CALCIUM NITRATE UN 1454", under the section for "Loading", in the second sentence, replace the words "of the Code" with the words "of this Code".

CALCIUM NITRATE FERTILIZER

40 In the individual schedule for "CALCIUM NITRATE FERTILIZER", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

CARBORUNDUM

41 In the individual schedule for "CARBORUNDUM", under the section for "Loading", replace the words "of the Code" with the words "of this Code" and add the following text:

"As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.";

and under the section for "Precautions", replace the word "should" with the word "shall".

CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE UN 2969

42 In the individual schedule for "CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE UN 2969", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

CEMENT CLINKERS

43 In the individual schedule for "CEMENT CLINKERS", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

CHAMOTTE

44 In the individual schedule for "CHAMOTTE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

CHARCOAL

45 In the individual schedule for "CHARCOAL", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

CHOPPED RUBBER AND PLASTIC INSULATION

46 In the individual schedule for "CHOPPED RUBBER AND PLASTIC INSULATION", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

CHROME PELLETS

47 In the individual schedule for "CHROME PELLETS", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

CHROMITE ORE

48 In the individual schedule for "CHROMITE ORE ", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

CLAY

49 In the individual schedule for "CLAY", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

CLINKER ASH

50 In the existing individual schedule for "CLINKER ASH", under the section for "Description", in the fourth sentence, the words "taken out" are replaced with "discharged" twice. Under the section for "Hazard", in the second sentence, replace the words "of the Code" with the words "of this Code". Under the section for "Loading", replace the words "of the Code" with the words "of this Code".

COAL

51 In the individual schedule for "COAL", under the BCSN, add the following sentences and the corresponding footnote:

> "Coal shall be classified as Group A and B unless classified as Group B only by a test determined by the appropriate authority* or where it has the following particle size distribution:
>
> .1 not more than 10% by weight of particles less than 1 mm (D10 > 1mm); and

.2 not more than 50% by weight of particles less than 10 mm (D50 > 10 mm).

Notwithstanding the above, a blend of two or more coals shall be classified as Group A and B unless all original coals in the blend are Group B only.

---

* See subsection 8.1 of this Code."

52 Under the section for "Hazard", delete the sentence "Can liquefy if predominantly fine 75% less than 5 mm coal." and add the sentence "This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code." at the end of the section.

53 Under the section for "Weather precautions", replace paragraphs .1 and .4 with the following sentences, respectively:

".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"

and

".4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and";

and under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code". and add the sentence "Due consideration shall be given to moisture migration and formation of dangerous wet base when blended coals are loaded." at the end of the section.

54 In the appendix, under the section "Special precautions", in "2 Self-heating coals", in paragraph .5, after the words "and the company", add "*" with the following footnote:

"* Refer to SOLAS regulation IX/1.2."

COAL SLURRY

55 In the individual schedule for "COAL SLURRY", under the section for "Hazard", replace the first sentence with:

"This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.";

under the section for "Weather precautions", replace paragraphs .1 and .4 with the following sentences, respectively:

".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"

and

".4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and";

and under the section for "Loading", replace the words "of the Code" with the words "of this Code".

COAL TAR PITCH

56 In the individual schedule for "COAL TAR PITCH", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

COARSE CHOPPED TYRES

57 In the individual schedule for "COARSE CHOPPED TYRES", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

COARSE IRON AND STEEL SLAG AND ITS MIXTURE

58 In the individual schedule for "COARSE IRON AND STEEL SLAG AND ITS MIXTURE", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

COKE

59 In the individual schedule for "COKE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

COKE BREEZE

60 In the individual schedule for "COKE BREEZE", under the section for "Hazard", replace the first sentence with:

> "This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.";

under the section for "Weather precautions", replace paragraphs .1 and .4 with the following sentences, respectively:

> ".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"
>
> and
>
> ".4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and";

and under the section for "Loading", replace the words "of the Code" with the words "of this Code".

COLEMANITE

61 In the individual schedule for "COLEMANITE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

COPPER GRANULES

62 In the individual schedule for "COPPER GRANULES", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

COPPER MATTE

63 In the individual schedule for "COPPER MATTE", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

COPPER SLAG

64 In the individual schedule for "COPPER SLAG ", under the section for "Hazard", in the first sentence, add the word "a" before the words "moisture content". Under the section for "Loading", replace the first sentence with the following:

> "This cargo shall be trimmed to ensure that the height difference between peaks and troughs does not exceed 5% of the ship's breadth and that the cargo slopes uniformly from the hatch boundaries to the bulkheads to avoid steep surfaces of cargo that could collapse during voyage.";

and under the section for "Carriage", add the following text at the end of the section:

> "The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge."

COPRA (dry) UN 1363

65 In the individual schedule for "COPRA (dry) UN 1363", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code". Under the section for "Precautions", after the words "concentration of oxygen", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

CRUSHED CARBON ANODES

66 In the individual schedule for "CRUSHED CARBON ANODES", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

CRYOLITE

67 In the individual schedule for "CRYOLITE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

DIAMMONIUM PHOSPHATE (D.A.P.)

68 In the individual schedule for "DIAMMONIUM PHOSPHATE (D.A.P.)", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

DIRECT REDUCED IRON (A) Briquettes, hot-moulded

69 In the individual schedule for "DIRECT REDUCED IRON (A) Briquettes, hot-moulded", under the section for "Loading", in the sixth sentence, replace the words "of the Code" with the words "of this Code"; add the following text at the end of the section:

> "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.";

under the section for "Precautions", in the last sentence, after the words "adjacent spaces", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).";

and under the sections for "Carriage" and "Discharge", replace the words "(> 25% LEL)" with "(> 25% lower explosive limit (LEL))". Under the section for "Clean-up", in the third sentence, replace the word "should" with the word "shall".

DIRECT REDUCED IRON (B) Lumps, pellets, cold-moulded briquettes

70 In the individual schedule for "DIRECT REDUCED IRON (B) Lumps, pellets, cold-moulded briquettes", under the section for "Loading", in the sentence "Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code", replace the words "of the Code" with the words "of this Code"; add the following text:

> "When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.";

under the section for "Precautions", in the sentence "All precautions shall be taken when entering the cargo spaces", after the words "entering the cargo spaces", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).";

and under the sections for "Carriage" and "Discharge", replace the words "(> 25% LEL)" with "(> 25% lower explosive limit (LEL))". Under the section for "Clean-up", in the second sentence, replace the word "should" with the word "shall".

DIRECT REDUCED IRON (C) By-product fines

71 In the individual schedule for "DIRECT REDUCED IRON (C) (By-product fines)", under the section for "Loading", in the sentence "Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code", replace the words "of the Code" with the words "of this Code"; and add the following text:

> "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.";

under the section for "Precautions", in the sixteenth sentence, after the words "to support life", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).";

and under the sections for "Carriage" and "Discharge", replace the words "(> 25% LEL)" with "(> 25% lower explosive limit (LEL))".

DISTILLERS DRIED GRAINS WITH SOLUBLES

72 In the individual schedule for "DISTILLERS DRIED GRAINS WITH SOLUBLES", under the section for "Loading", in the second sentence, replace the words "of the Code" with the words "of this Code".

DOLOMITE

73 In the individual schedule for "DOLOMITE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

FELSPAR LUMP

74 In the individual schedule for "FELSPAR LUMP", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

FERROCHROME

75 In the individual schedule for "FERROCHROME", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

FERROCHROME, exothermic

76 In the individual schedule for "FERROCHROME, exothermic", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

FERROMANGANESE

77 In the individual schedule for "FERROMANGANESE", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

FERRONICKEL

78 In the individual schedule for "FERRONICKEL", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

FERROPHOSPHORUS (including briquettes)

79 In the individual schedule for "FERROPHOSPHORUS (including briquettes)", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

FERROSILICON UN 1408 with 30% or more but less than 90% silicon (including briquettes)

80 In the individual schedule for "FERROSILICON UN 1408 with 30% or more but less than 90% silicon (including briquettes)", replace the table in the section for "Characteristics" with the following:

"

Angle of repose	Bulk density (kg/m^3)		Stowage factor (m^3/t)
Not applicable	1,389 to 2,083 (1,111 to 1,538 for briquettes)		0.48 to 0.72 (0.65 to 0.90 for briquettes)
Size	**Class**	**Subsidiary risk**	**Group**
Up to 300 mm briquettes	4.3	6.1	B

"

Under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code"; and replace the sentences "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo." with the following:

> "When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.";

and under the section for "Operational requirements" in the appendix, in (vii), after the words "below 18%", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

FERROSILICON 25% to 30% silicon, or 90% or more silicon (including briquettes)

81 In the individual schedule for "FERROSILICON 25% to 30% silicon, or 90% or more silicon (including briquettes)", the Bulk Cargo Shipping Name is replaced with following:

> "FERROSILICON with at least 25% but less than 30% silicon, or 90% or more silicon";

in the table of "Characteristics", under the section for "Size", the words "Diameter: 2.54" are replaced with "Up to 300 mm briquettes". Under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code"; and replace the sentences "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo." with the following:

> "When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.";

and under the section for "Operational requirements" in the appendix, in (vii), after the words "below 18%", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS UN 2793 in a form liable to self-heating

82 In the individual schedule for "FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS UN 2793 in a form liable to self-heating", under the section for "Discharge", after the words "appropriate breathing apparatus", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

FERROUS SULPHATE HEPTAHYDRATE

83 In the individual schedule for "FERROUS SULPHATE HEPTAHYDRATE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

FERTILIZERS WITHOUT NITRATES (non-hazardous)

84 In the individual schedule for "FERTILIZERS WITHOUT NITRATES (non-hazardous)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

FISH (IN BULK)

85 In the individual schedule for "FISH (IN BULK)", under the section for "Loading", replace the words "of the Code" with the words "of this Code". Under the section for "Carriage", replace the words "No special requirements" with the following:

> "The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge."

FISHMEAL (FISHSCRAP), STABILIZED UN 2216 Anti-oxidant treated

86 In the individual schedule for "FISHMEAL (FISHSCRAP), STABILIZED UN 2216 Anti-oxidant treated", in the provision under the Bulk Cargo Shipping Name, delete the term "Group C,"; and under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

FLUORSPAR

87 In the individual schedule for "FLUORSPAR", under the section for "Hazard", replace the first and second sentence with:

> "This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.";

under the section for "Loading", replace the words "of the Code" with the words "of this Code"; add the following text:

> "When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.";

under the section for "Weather precautions", replace paragraphs .1 and .4 with the following sentences, respectively:

> ".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"
>
> and
>
> ".4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and";

and under the section for "Carriage", replace the sentence "No special requirements." with the following:

> "The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge."

FLY ASH, DRY

88 In the individual schedule for "FLY ASH, DRY", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code". Under the section for "Clean-up", replace the words "FLY ASH" with "fly ash".

FLY ASH, WET

89 In the individual schedule for "FLY ASH, WET", under the section for "Hazard", replace the first sentence with:

> "This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.";

under the section for "Weather precautions", replace paragraphs .1 and .4 with the following sentences, respectively:

> ".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"
>
> and
>
> ".4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and";

and under the section for "Loading", replace the words "of the Code" with the words "of this Code".

GLASS CULLET

90 In the existing individual schedule for "GLASS CULLET", at the end of the section for "Description", add the following text:

> "It may also be flint flat glass cullet which may have a grey or ochre appearance caused by adherent glass dust. May have a slight odour caused by organic impurities (plastics, foil). Used for glass production (bottle industry).";

and replace the existing table of "Characteristics", with the following:

"

Angle of repose	**Bulk density (kg/m3)**	**Stowage factor (m3/t)**
Not applicable	600 to 1,330	0.75 to 1.67
Size	**Class**	**Group**
Up to 2,000 mm	Not applicable	C

"

GRAIN SCREENING PELLETS

91 In the individual schedule for "GRAIN SCREENING PELLETS", under the section for "Loading", in the first sentence, replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code", and delete the words "in accordance with the shipper's declaration of the angle of repose".

GRANULAR FERROUS SULPHATE

92 In the individual schedule for "GRANULAR FERROUS SULPHATE", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

GRANULATED NICKEL MATTE (LESS THAN 2% MOISTURE CONTENT)

93 In the individual schedule for "GRANULATED NICKEL MATTE (LESS THAN 2% MOISTURE CONTENT)", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

GRANULATED SLAG

94 In the individual schedule for "GRANULATED SLAG", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

GRANULATED TYRE RUBBER

95 In the individual schedule for "GRANULATED TYRE RUBBER", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

GYPSUM

96 In the individual schedule for "GYPSUM", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

GYPSUM GRANULATED

97 In the individual schedule for "GYPSUM GRANULATED", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

ILMENITE CLAY

98 In the individual schedule for "ILMENITE CLAY", under the section for "Hazard", replace the first sentence with:

> "This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.";

under the section for "Weather precautions", replace paragraphs .1 and .4 with the following sentences, respectively:

> ".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"
>
> and
>
> ".4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and";

and under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

ILMENITE (ROCK)

99 In the individual schedule for "ILMENITE (ROCK)", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

ILMENITE SAND

100 In the existing individual schedule for "ILMENITE SAND", under the Bulk Cargo Shipping Name, delete the sentence "This cargo can be categorized as Group A or C.". Under the section for "Description", delete the sentences "The moisture content of this cargo in Group C is 1% to 2%. When moisture content is above 2%, this cargo is to be categorized in Group A." In the table of "Characteristics", in the column for "Group", delete the words "or C". Replace the text under the section for "Hazard" with following:

> "This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible or has a low fire-risk.";

and under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code". Replace the text under the section for "Weather precautions" with the following:

> "When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:
>
> .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port."

ILMENITE (UPGRADED)

101 In the individual schedule for "ILMENITE (UPGRADED)", under the section for "Hazard", in the first sentence, add the word "a" before the words "moisture content". Under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

IRON ORE FINES

102 In the individual schedule for "IRON ORE FINES", under the section for "Hazard", add the word "a" before the words "moisture content". Under the section for "Carriage", in the second sentence, delete the words "as far as practicable".

IRON ORE PELLETS

103 In the individual schedule for "IRON ORE PELLETS", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

IRON OXIDE, SPENT or IRON SPONGE, SPENT UN 1376 obtained from coal gas purification

104 In the individual schedule for "IRON OXIDE, SPENT or IRON SPONGE, SPENT UN 1376 obtained from coal gas purification", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

IRON OXIDE TECHNICAL

105 In the individual schedule for "IRON OXIDE TECHNICAL", under the section for "Hazard", add the word "a" before the words "moisture content".

IRONSTONE

106 In the individual schedule for "IRONSTONE", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

LABRADORITE

107 In the individual schedule for "LABRADORITE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

LEAD NITRATE UN 1469

108 In the individual schedule for "LEAD NITRATE UN 1469", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

LEAD ORE

109 In the individual schedule for "LEAD ORE", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code" and replace the text "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo." with the following:

> "When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo."

LIME (UNSLAKED)

110 In the individual schedule for "LIME (UNSLAKED)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

LIMESTONE

111 In the individual schedule for "LIMESTONE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

LINTED COTTON SEED with not more than 9% moisture and not more than 20.5% oil

112 In the individual schedule for "LINTED COTTON SEED with not more than 9% moisture and not more than 20.5% oil", under the section for "Loading", replace the words "of the Code" with the words "of this Code";

under the section for "Precautions", after the words "concentration of oxygen", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).";

and under the section for "Carriage", replace the word "should" with the word "shall".

MAGNESIA (DEADBURNED)

113 In the individual schedule for "MAGNESIA (DEADBURNED)", under the section for "Loading", replace the words "of the Code" with the words "of this Code"; and add the following text:

> "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo."

MAGNESIA (UNSLAKED)

114 In the individual schedule for "MAGNESIA (UNSLAKED)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

MAGNESITE, natural

115 In the individual schedule for "MAGNESITE, natural", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

MAGNESIUM NITRATE UN 1474

116 In the individual schedule for "MAGNESIUM NITRATE UN 1474", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

MAGNESIUM SULPHATE FERTILIZERS

117 In the individual schedule for "MAGNESIUM SULPHATE FERTILIZERS", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

MANGANESE ORE

118 In the individual schedule for "MANGANESE ORE", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code". Replace the text "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo." with the following:

> "When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo."

MANGANESE ORE FINES

119 In the individual schedule for "MANGANESE ORE FINES", under the section for "Hazard", in the first sentence, add the word "a" before the words "moisture content".

MARBLE CHIPS

120 In the individual schedule for "MARBLE CHIPS", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

METAL SULPHIDE CONCENTRATES

121 In the individual schedule for "METAL SULPHIDE CONCENTRATES", in the table of "Characteristics", under "Class", after the word "MHB", add "(SH) and/or (CR) and/or (TX)". Under the section for "Hazard", add a first sentence as follows:

> "Some metal sulphide concentrates may have acute and long term health effects.";

add the following text at the beginning of the section:

"This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.";

under the section for "Weather precautions", replace paragraphs .1 and .4 with the following sentences, respectively:

".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"

and

".4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and";

under the section for "Loading", replace the first sentence with the following:

"This cargo shall be trimmed to ensure that the height difference between peaks and troughs does not exceed 5% of the ship's breadth and that the cargo slopes uniformly from the hatch boundaries to the bulkheads to avoid steep surfaces of cargo that could collapse during voyage.";

and under the section for "Precautions", after the words "concentration of oxygen", add "*" with the following footnote:

"* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

Mineral Concentrates

122 In the individual schedule for "Mineral Concentrates", under the section for "Hazard", replace the first and second sentence with:

"The above materials may liquefy if shipped at a moisture content in excess of their transportable moisture limit (TML). See sections 7 and 8 of this Code.";

under the section for "Weather precautions", replace paragraphs .1 and .4 with the following sentences, respectively:

".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"

and

".4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and";

and replace the text under the section for "Loading" with the following:

"This cargo shall be trimmed to ensure that the height difference between peaks and troughs does not exceed 5% of the ship's breadth and that the cargo slopes uniformly from the hatch boundaries to the bulkheads to avoid steep surfaces of cargo that could collapse during voyage.

When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo."

MONOAMMONIUM PHOSPHATE (M.A.P.)

123 In the individual schedule for "MONOAMMONIUM PHOSPHATE (M.A.P.)", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

NICKEL ORE

124 In the individual schedule for "NICKEL ORE", under the section for "Weather precautions", replace paragraph .1 with following:

".1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;"

and under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

PEANUTS (in shell)

125 In the individual schedule for "PEANUTS (in shell)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

PEAT MOSS

126 In the individual schedule for "PEAT MOSS", under the section for "Hazard", add the following text at the beginning:

"This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.";

and under the section for "Loading", replace the words "of the Code" with the words "of this Code". Under the section for "Precautions", after the words "a normal level", add "*" with the following footnote:

"* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

PEBBLES (sea)

127 In the individual schedule for "PEBBLES (sea)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

PELLETS (concentrates)

128 In the individual schedule for "PELLETS (concentrates)", under the section for "Loading", replace the words "of the Code" with the words "of this Code"; and add the following text at the end of the section:

"As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo."

PERLITE ROCK

129 In the individual schedule for "PERLITE ROCK", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

PHOSPHATE (defluorinated)

130 In the individual schedule for "PHOSPHATE (defluorinated)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

PHOSPHATE ROCK (calcined)

131 In the individual schedule for "PHOSPHATE ROCK (calcined)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

PHOSPHATE ROCK (uncalcined)

132 In the individual schedule for "PHOSPHATE ROCK (uncalcined)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

PIG IRON

133 In the individual schedule for "PIG IRON", under the section for "Loading", in the third sentence, replace the words "of the Code" with the words "of this Code".

PITCH PRILL

134 In the individual schedule for "PITCH PRILL", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

POTASH

135 In the individual schedule for "POTASH", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

POTASSIUM CHLORIDE

136 In the individual schedule for "POTASSIUM CHLORIDE", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

POTASSIUM NITRATE UN 1486

137 In the individual schedule for "POTASSIUM NITRATE UN 1486", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

POTASSIUM SULPHATE

138 In the individual schedule for "POTASSIUM SULPHATE", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

PUMICE

139 In the individual schedule for "PUMICE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

PYRITE (containing copper and iron)

140 In the individual schedule for "PYRITE (containing copper and iron)", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

PYRITES, CALCINED (Calcined Pyrites)

141 In the individual schedule for "PYRITES, CALCINED (Calcined Pyrites)", under the section for "Hazard", replace the third sentence with the following:

> "This cargo may liquefy if shipped at a moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.";

under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

PYROPHYLLITE

142 In the individual schedule for "PYROPHYLLITE", under the section for "Loading", replace the words "of the Code" with the words "of this Code"; add the following text at the end of the section:

> "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo."

QUARTZ

143 In the individual schedule for "QUARTZ", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

QUARTZITE

144 In the individual schedule for "QUARTZITE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non-fissile or fissile – excepted UN 2912

145 In the individual schedule for "RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non-fissile or fissile – excepted UN 2912", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I), non-fissile or fissile – excepted UN 2913

146 In the individual schedule for "RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I), non-fissile or fissile – excepted UN 2913", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

RASORITE (ANHYDROUS)

147 In the individual schedule for "RASORITE (ANHYDROUS)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

RUTILE SAND

148 In the individual schedule for "RUTILE SAND", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

SALT

149 In the individual schedule for "SALT", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SALT CAKE

150 In the individual schedule for "SALT CAKE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SALT ROCK

151 In the individual schedule for "SALT ROCK", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SAND

152 In the individual schedule for "SAND", under the section for "Loading", replace the words "of the Code" with the words "of this Code". Add the following text at the end of the section:

> "When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo."

SAND, HEAVY MINERAL

153 In the individual schedule for "SAND, HEAVY MINERAL", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SAWDUST

154 In the individual schedule for "SAWDUST", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SCALE GENERATED FROM THE IRON AND STEEL MAKING PROCESS

155 In the individual schedule for "SCALE GENERATED FROM THE IRON AND STEEL MAKING PROCESS", under the section for "Hazard", add the word "a" before the words "moisture content".

SEED CAKE, containing vegetable oil UN 1386 (a) mechanically expelled seeds, containing more than 10% of oil or more than 20% of oil and moisture combined

156 In the individual schedule for "SEED CAKE, containing vegetable oil UN 1386 (a) mechanically expelled seeds, containing more than 10% of oil or more than 20% of oil and moisture combined", under the section for "Loading", replace the words "of the Code" with the words "of this Code". Under the section for "Precautions", after the words "a normal level", add "*" with the following footnote:

"* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

SEED CAKE, containing vegetable oil UN 1386 (b) solvent extractions and expelled seeds, containing not more than 10% of oil and when the amount of moisture is higher than 10%, not more than 20% of oil and moisture combined

157 In the individual schedule for "SEED CAKE, containing vegetable oil UN 1386 (b) solvent extractions and expelled seeds, containing not more than 10% of oil and when the amount of moisture is higher than 10%, not more than 20% of oil and moisture combined", in the sentence "When, in solvent extracted seed cake, the oil or oil and moisture content exceeds the percentages stated above, guidance should be sought from the competent authorities." after BCSN, replace the word "should" with the word "shall". Under the section for "Loading", in the last sentence, replace the words "of the Code" with the words "of this Code". Under the section for "Ventilation", replace the word "should" with the word "shall". Under the section for "Precautions", after the words "a normal level", add "*" with the following footnote:

"* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

SEED CAKE UN 2217 with not more than 1.5% oil and not more than 11% moisture

158 In the individual schedule for "SEED CAKE UN 2217 with not more than 1.5% oil and not more than 11% moisture", under the section for "Loading", in the second sentence, replace the words "of the Code" with the words "of this Code". Under the section for "Ventilation", replace the word "should" with the word "shall". Under the section for "Precautions", after the words "a normal level", add "*" with the following footnote:

"* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

SEED CAKE (non-hazardous)

159 In the individual schedule for "SEED CAKE (non-hazardous)", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

SILICOMANGANESE (low carbon)

160 In the individual schedule for "SILICOMANGANESE (low carbon)", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code". Under the section for "Precautions", replace the word "should" with the word "shall"; after the words "has been effected", add "*" with the following footnote:

"* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

SILICON SLAG

161 In the individual schedule for "SILICON SLAG", in the table of "Characteristics", under the column "Bulk density (kg/m³)", the numerical value "2,300" is replaced with "1,500"; under the column for "Stowage factor (m³/t)", the numerical value "0.43" is replaced with "0.67". Under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code"; and the second and third sentences are replaced with following:

> "When the stowage factor of this cargo is equal or less than 0.56 m³/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo."

SODA ASH (Dense and light)

162 In the individual schedule for "SODA ASH (Dense and light)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SODIUM NITRATE UN 1498

163 In the individual schedule for "SODIUM NITRATE UN 1498", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE UN 1499

164 In the individual schedule for "SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE UN 1499", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

SOLIDIFIED FUELS RECYCLED FROM PAPER AND PLASTICS

165 In the individual schedule for "SOLIDIFIED FUELS RECYCLED FROM PAPER AND PLASTICS", under the section for "Loading", in the second sentence, replace the words "of the Code" with the words "of this Code". Under the section for "Precautions", after the words "sufficiently ventilated", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

SPODUMENE (UPGRADED)

166 In the individual schedule for "SPODUMENE (UPGRADED)", under the section for "Hazard", add the word "a" before the words "moisture content".

STAINLESS STEEL GRINDING DUST

167 In the individual schedule for "STAINLESS STEEL GRINDING DUST", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

STONE CHIPPINGS

168 In the individual schedule for "STONE CHIPPINGS", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SUGAR

169 In the individual schedule for "SUGAR", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SULPHUR (formed, solid)

170 In the individual schedule for "SULPHUR (formed, solid)", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

SULPHUR UN 1350 (crushed lump and coarse grained)

171 In the individual schedule for "SULPHUR UN 1350 (crushed lump and coarse grained)", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

SUPERPHOSPHATE

172 In the individual schedule for "SUPERPHOSPHATE", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

SUPERPHOSPHATE (triple, granular)

173 In the individual schedule for "SUPERPHOSPHATE (triple, granular)", under the section for "Loading", replace the words "of the Code" with the words "of this Code". Under the sections for "Precautions" and "Clean-up", respectively, replace the word "should" with the word "shall".

TACONITE PELLETS

174 In the individual schedule for "TACONITE PELLETS", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

TALC

175 In the individual schedule for "TALC", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

TANKAGE

176 In the individual schedule for "TANKAGE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

TAPIOCA

177 In the individual schedule for "TAPIOCA", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

UREA

178 In the individual schedule for "UREA", under the section for "Loading", replace the words "under sections 4, 5 and 6 of the Code" with the words "under sections 4 and 5 of this Code".

VANADIUM ORE

179 In the individual schedule for "VANADIUM ORE", under the section for "Loading", replace the words "of the Code" with the words "of this Code"; add the following text at the end of the section:

> "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.";

and under the section for "Precautions", replace the word "should" with the word "shall".

VERMICULITE

180 In the individual schedule for "VERMICULITE", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

WHITE QUARTZ

181 In the individual schedule for "WHITE QUARTZ", under the section for "Loading", replace the words "of the Code" with the words "of this Code".

WOODCHIPS

182 In the individual schedule for "WOODCHIPS", under the section for "Loading", replace the words "of the Code" with the words "of this Code". Under the section for "Precautions", in the first and second sentences, respectively, replace the word "should" with the word "shall"; after the words "oxygen level is 20.7%", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

WOOD PELLETS CONTAINING ADDITIVES AND/OR BINDERS

183 In the individual schedule for "WOOD PELLETS CONTAINING ADDITIVES AND/OR BINDERS", under the section for "Description", the fifth sentence is replaced with the following:

> "The raw material is compressed to approximately one-third of its original volume. The finished wood pellets typically have a moisture content of 4% to 8%.";

under the section for "Loading", replace the words "under sections 4, 5 and 6 of this Code" with the words "under sections 4 and 5 of this Code"; and under the section for "Precautions", after the words "carbon monoxide <100 ppm", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

WOOD PELLETS NOT CONTAINING ANY ADDITIVES AND/OR BINDERS

184 In the individual schedule for "WOOD PELLETS NOT CONTAINING ANY ADDITIVES AND/OR BINDERS", under the section for "Description", the fifth sentence is replaced with the following:

> "The raw material is compressed to approximately one-third of its original volume. The finished wood pellets typically have a moisture content of 4% to 8%.";

under the section for "Loading", replace the words "under sections 4, 5 and 6 of this Code" with the words "under sections 4 and 5 of this Code". Under the section for "Precautions", after the words "carbon monoxide <100 ppm", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

Wood Products – General

185 In the individual schedule for "Wood Products – General", under the section for "Precautions", after the words "oxygen level is 21%", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27).";

and under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

WOOD TORREFIED

186 In the individual schedule for "WOOD TORREFIED", under the section for "Loading", replace the words "section 4, 5 and 6 of the Code" with the words "section 4 and 5 of this Code". Under the section for "Precautions", after the words "carbon monoxide < 100 ppm", add "*" with the following footnote:

> "* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

ZINC ASHES UN 1435

187 In the individual schedule for "ZINC ASHES UN 1435", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

ZINC SLAG

188 In the individual schedule for "ZINC SLAG", under the section for "Hazard", add the word "a" before the words "moisture content". Under the section for "Loading", replace the first sentence with the following:

> "This cargo shall be trimmed to ensure that the height difference between peaks and troughs does not exceed 5% of the ship's breadth and that the cargo slopes uniformly from the hatch boundaries to the bulkheads to avoid steep surfaces of cargo that could collapse during the voyage."

and under the section for "Carriage", add the following text at the end of the section:

> "The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge."

ZIRCON KYANITE CONCENTRATE

189 In the individual schedule for "ZIRCON KYANITE CONCENTRATE", under the section for "Hazard", add the word "a" before the words "moisture content". Under the section for "Loading", replace the second and the third sentences with the following text:

> "As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo."

ZIRCONSAND

190 In the individual schedule for "ZIRCONSAND", under the section for "Loading", in the first sentence, replace the words "of the Code" with the words "of this Code".

New individual schedules

191 Insert the following new individual schedules accordingly in alphabetical order:

"**FOAM GLASS GRAVEL**

Description
Foam glass gravel is a lightweight insulation product used in the construction/building industry. This cargo is odourless and of grey anthracite colour.

Characteristics

Angle of repose	**Bulk density (kg/m³)**	**Stowage factor (m³/t)**
Not applicable	130 to 250	4.0 to 7.6
Size	**Class**	**Group**
Varies	Not applicable	C

Hazard
Dust may cause skin and eye irritation.
This cargo is non-combustible or has a low fire-risk.

Stowage & segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather Precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

Precautions
Persons who may be exposed to the dust of the cargo shall wear goggles or other equivalent dust eye-protection and dust filter masks as well as protective clothing, as necessary. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
Entry into the cargo spaces containing this cargo shall only be permitted for trained personnel wearing protective clothing and goggles or other equivalent dust eye-protection as well as dust filter masks.

Clean-up
No special requirements."

"**IRON SMELTING BY-PRODUCTS**

Description
This cargo is a by-product from the smelting of iron ore, ilmenite and titanomagnetite. Grey or black, small to large size lumps (up to 45 tonnes), granulated iron included. Depending on the dominant size, Iron by-products from smelting of iron ore, ilmenite and titanomagnetite is called variously:

Iron pan edges
Separation of iron
Granulated iron
Plate iron
Pool iron
Flat iron
K1-K3 bears
Steel bears
Pig iron by-product
Beach iron
Iron skulls

Characteristics

Angle of repose	**Bulk density (kg/m³)**	**Stowage factor (m³/t)**
Not applicable	Varies	Varies
Size	**Class**	**Group**
Varies	Not applicable	C

Hazard
No special hazards.
This cargo is non-combustible or has a low fire-risk.

Stowage & segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

The tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo. Large pieces shall not be dropped in the cargo hold and placement of very large lumps shall be such that the tank top is not overstressed by point loads. The weight distribution in the hold shall be considered during loading.

Precautions
Bilge wells of the cargo spaces shall be protected from ingress of the cargo.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
When this cargo is discharged by magnet or spider grab:

.1 the deck and deck machineries shall be protected from falling cargo; and

.2 damages to the ship shall be checked, after the completion of discharge.

Clean-up
No special requirements."

"**METAL SULPHIDE CONCENTRATES, CORROSIVE UN 1759**
(see also Mineral Concentrates schedule)

This schedule shall only apply to cargoes that would fall under Packing Group (PG) III as specified in the IMDG Code if they were carried in a packaged form.

Description
Mineral concentrates are refined ores in which the valuable components have been enriched by eliminating the bulk of waste materials. Generally the particle size is small, although agglomerates sometimes exist in concentrates which have not been freshly produced.

The most common concentrates in this category are: zinc concentrates, lead concentrates, copper concentrates and low grade middling concentrates.

Characteristics

Angle of repose	Bulk density (kg/m³)	Stowage factor (m³/t)
Not applicable	1,700 to 3,230	0.31 to 0.59
Size	**Class**	**Group**
Various	8*	A and B

*This material may also meet MHB criteria of self-heating solids and/or solids that evolve toxic gas when wet.

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.

Some sulphide concentrates are liable to oxidation and may have a tendency to self-heat, with associated oxygen depletion and emission of toxic fumes. Moisture in the cargo will form sulphurous acid which is corrosive to steel.

Stowage & Segregation
Unless determined by the competent authority, segregation as required for class 4.2 and Class 8 materials.

"Separated from" foodstuffs.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
When this cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo forming.

Precautions
Entry into the cargo space for this cargo shall not be permitted until the space has been ventilated and the atmosphere tested for concentration of oxygen*. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of this cargo. Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

Bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure it is working. Persons who may be exposed to the dust of the cargo shall wear gloves, goggles or other equivalent dust eye-protection and dust filter masks. Those persons shall wear protective clothing, as necessary.

When a Metal Sulphide Concentrate is considered as presenting a low fire-risk, the carriage of such cargo on a ship not fitted with a fixed gas fire-extinguishing system shall be subject to the Administration's authorization as provided by SOLAS regulation II-2/10.7.1.4.

Ventilation
The cargo shall not be ventilated during the voyage.

Carriage
The appearance of the surface of the cargo shall be checked regularly during the voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate action to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

For quantitative measurements of oxygen and toxic fumes liable to be evolved by the cargo, suitable detectors for each gas and fume or combination of these shall be on board while this cargo is carried. The detectors shall be suitable for use in an atmosphere without oxygen.

The concentrations of these gases in the cargo spaces carrying this cargo shall be measured regularly during voyage, and the results of the measurements shall be recorded and kept on board.

Discharge
No special requirements.

Clean-up
Ensure that all residues are washed away and the holds thoroughly dried. Wet dust or residues will form corrosive sulphurous acid, which is dangerous to personnel and will corrode steel.

Emergency procedures

Special emergency equipment to be carried
Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus.
Emergency procedures Wear protective clothing and self-contained breathing apparatus. **Emergency action in the event of fire** Batten down; use ship's fixed firefighting installation, if fitted. Exclusion of air may be sufficient to control the fire. **Do not use water**. **Medical first aid** Refer to the Medical First Aid Guide (MFAG), as amended.

Remarks
Fire may be indicated by the smell of sulphur dioxide.

***** Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

"**MONOAMMONIUM PHOSPHATE (M.A.P.), MINERAL ENRICHED COATING**

Description
This cargo is monoammonium phosphate (M.A.P.) with a mineral enriched coating. Odourless, brownish-grey granules. It is hygroscopic and can be very dusty.

Characteristics

Angle of repose	**Bulk density (kg/m³)**	**Stowage factor (m³/t)**
35° to 40°	826 to 1,000	1.0 to 1.21
Size	**Class**	**Group**
Up to 4 mm	MHB (CR)	B

Hazard
This cargo has a pH of 4.5 and in the presence of moisture can be highly corrosive to eyes and skin.
This cargo is non-combustible or has a low fire-risk.
This cargo will cake if wet.
This cargo will decompose burlap or canvas cloth covering bilge wells. Continuous carriage of this cargo may have detrimental structural effects over a long period of time.

Stowage & Segregation
No special requirements.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

Precautions
Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress of the cargo. Due consideration shall be paid to protect equipment from the dust of the cargo. Persons who may be exposed to the dust of the cargo shall wear gloves, goggles or other equivalent dust eye-protection and dust filter masks. Those persons shall wear protective clothing, as necessary.

Ventilation
The cargo spaces carrying this cargo shall not be ventilated during voyage.

Carriage
Condensation in the cargo spaces carrying this cargo, sweating of this cargo and entering of water from hatch covers to the cargo spaces shall be checked regularly during the voyage. Due attention shall be paid to the sealing of hatches of the cargo spaces.

Discharge
This cargo is hygroscopic and may cake in overhangs, impairing safety during discharge. If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

Clean-up
After discharge of this cargo, particular attention shall be paid to bilge wells of the cargo spaces.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus.
Emergency procedures Wear protective clothing and self-contained breathing apparatus. **Emergency action in the event of fire** Batten down; use ship's fixed firefighting installation, if fitted. **Medical first aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"**MONOCALCIUMPHOSPHATE (MCP)**

Description
The product consists of Monocalciumphosphate, monohydrate. Granulated. Light grey. Odourless.

Characteristics

Angle of repose	Bulk density (kg/m3)	Stowage factor (m3/t)
Approximately 32°	900 to 1,100	0.91 to 1.11
Size	**Class**	**Group**
0.2 to 2 mm	MHB (CR)	A and B

Hazard
This cargo is non-combustible or has a low fire-risk.
Potential inhalation hazard and eye irritation from Monocalciumphosphate dust during handling, placement and transportation.

Stowage & segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

Precautions
Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress of the cargo. Due consideration shall be paid to protect equipment from the dust of the cargo. Persons who may be exposed to the dust of the cargo shall wear protective clothing, gloves, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

Ventilation
No special requirements.

Carriage
The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
Avoid handling which creates dust.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus.
Emergency procedures Wear protective clothing and self-contained breathing apparatus. **Emergency action in the event of fire** Batten down; use ship's fixed firefighting installation, if fitted. Exclusion of air may be sufficient to control the fire. **Medical first aid** Refer to the Medical First Aid Guide (MFAG), as amended.

"

"**OLIVINE SAND**

Description
Olivine sand is a naturally occurring mineral and the colour can be pale greenish-grey to brownish.

Characteristics

Angle of repose	Bulk density (kg/m3)	Stowage factor (m3/t)
30° to 45°	1,600 to 1,900	0.53 to 0.63
Size	**Class**	**Group**
Up to 20 mm	Not applicable	A

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.

This cargo is non-combustible or has a low fire-risk.

Stowage & segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.

Precautions
No special requirements.

Ventilation
No special requirements.

Carriage
The appearance of the surface of the cargo shall be checked regularly during the voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**OLIVINE GRANULAR AND GRAVEL AGGREGATE PRODUCTS**

This schedule shall only apply to cargoes containing less than 5% of fine particles less than 0.5 mm.

Description
Olivine granular and gravel aggregate products are naturally occurring minerals and the colour can be pale greenish-grey to brownish.

Characteristics

Angle of repose	Bulk density (kg/m3)	Stowage factor (m3/t)
30° to 45°	1,600 to 1,900	0.53 to 0.63
Size	**Class**	**Group**
Up to 100 mm	Not applicable	C

Hazard
No special hazards.
This cargo is non-combustible or has a low fire-risk.

Stowage & segregation
No special requirements.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal to or less than 0.56 m^3/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.

Precautions
No special requirements.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SAND, MINERAL CONCENTRATE, RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) UN 2912**

Description
This cargo is generally a concentrate stream resulting from the processing of heavy mineral sands. Such mineral sand concentrates are characterized by their heavy bulk density and relatively fine grain size. This schedule includes concentrates of sands containing natural or depleted uranium and thorium, including metals, mixtures and compounds.

Abrasive. May be dusty. This cargo is cohesive if moisture content is above 1%.

Characteristics

Angle of repose	Bulk density (kg/m³)	Stowage factor (m³/t)
Approximately 35°	2,200 to 3,225	0.31 to 0.45
Size	**Class**	**Group**
Fine Particles up to 2 mm	7*	A and B

***** This material also meets MHB criteria of toxic solids and corrosive solids.

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.
Low radiotoxicity.
May cause long-term health effects and skin irritation.
Prolonged and repeated exposure to silica dust can result in respiratory disease.
This cargo is non-combustible or has a low fire-risk.

Stowage & segregation
"Separated from" foodstuffs.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.

Precautions
Personnel shall not be unnecessarily exposed to dust of this cargo. Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and facemasks. There shall be no leakage outside the cargo space in which this cargo is stowed.

Ventilation
The cargo spaces carrying this cargo shall not be ventilated during voyage.

Carriage
All instructions provided by the shipper shall be followed for the carriage of this cargo. The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
All instructions provided by the shipper shall be followed for the discharge of this cargo.

Clean-up
Cargo spaces used for this cargo shall not be used for other goods until decontaminated. Refer to subsection 9.3.2.3 of this Code.

Emergency procedures

Special emergency equipment to be carried Protective clothing (gloves, boots, coveralls, headgear). Self-contained breathing apparatus.
Emergency procedures Wear protective clothing and self-contained breathing apparatus. **Emergency action in the event of fire** Batten down; use ship's fixed firefighting installation, if fitted. Use water spray to control spread of dust, if necessary. **Medical first aid** Refer to the Medical First Aid Guide (MFAG), as amended.

Remarks
Most materials are likely to be non-combustible. Speedily collect and isolate potentially contaminated equipment and cover. Seek expert advice."

"**SILICOMANGANESE (carbo-thermic)**

Description
This material is a result of a carbo-thermic reduction process. A ferroalloy comprising principally manganese and silicon, mainly used as a deoxidizer and alloying element in the steel-making process. Particles or lumps of metallic-silver to dark-grey colour metal.

Characteristics

Angle of repose	Bulk density (kg/m³)	Stowage factor (m³/t)
Not applicable	3,100 to 4,000	0.25 to 0.32
Size	**Class**	**Group**
Fines up to 80 mm	Not applicable	C

Hazard
No special hazards.
This cargo is non-combustible or has a low fire-risk.

Stowage & segregation
"Separated from" acids, alkalis, oxidizing and reducing agents and foodstuffs.

Hold cleanliness
No special requirements.

Weather precautions
No special requirements.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.

Precautions
No special requirements.

Ventilation
No special requirements.

Carriage
No special requirements.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SUGARCANE BIOMASS PELLETS**

Description
Sugarcane Biomass Pellets are light blonde to chocolate brown in colour; very hard and cannot be easily squashed. Sugarcane Biomass Pellets are made of bagasse, straw and leaves left over from industrial and agricultural activities. Normally there are no additives or binders blended into the pellet. This schedule is also applicable to Sugarcane Biomass Pellets produced with the use of up to 2% of oxide-based mineral additives such as calcium, magnesium and aluminium oxides. The raw material is fragmented, dried and extruded into pellet form. The raw material is compressed to approximately one-third of its original volume and the finished Sugarcane Biomass Pellets typically have a moisture content of 6 to 10%.

Characteristics

Angle of repose	Bulk density (Kg/m³)	Stowage factor (m³/t)
Approximately 30°	600 to 700	1.43 to 1.67
Size	**Class**	**Group**
Cylindrical with Diameter: 6 to 12 mm. Length: 10 to 50 mm.	MHB (CB, WT, WF and OH)	B

Hazard
Shipments are subject to oxidation leading to depletion of oxygen and increase of carbon monoxide and carbon dioxide in cargo and communicating spaces (also see Weather precautions).

Swelling occurs if exposed to moisture. Sugarcane Biomass Pellets may ferment over time if moisture content is over 15% leading to generation of asphyxiating and flammable gases which may cause spontaneous combustion. Handling of Sugarcane Biomass Pellets may cause dust to develop. Risk of explosion at high dust concentration.

Stowage & segregation
Segregation as required for class 4.1 materials.

Hold cleanliness
Clean and dry as relevant to the hazards of the cargo.

Weather precautions
This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed. There is a high risk of renewed oxygen depletion and carbon monoxide formation in previously ventilated adjacent spaces after closure of the hatch covers.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

Precautions
Entry of personnel into the cargo spaces containing this cargo or the connecting spaces shall not be permitted until tests have been carried out and it has been established that the oxygen content and carbon monoxide levels have been restored to the following levels: oxygen 21% and carbon monoxide <100 ppm.* Close or direct contact of this cargo and cargo hold lighting such as hot halogen lamps shall be avoided. Fuses to such lights shall be removed or secured while this cargo is present in the cargo space. Precautions shall be taken to prevent generation of high concentrations of dust during handling and cleaning of this cargo.

Ventilation
Cargo spaces carrying this cargo shall not be ventilated during voyage. Ventilation of enclosed spaces adjacent to a cargo hold before entry may be necessary even if these spaces are apparently sealed from the cargo hold.

Carriage
Hatches of the cargo spaces carrying this cargo shall be weathertight to prevent the ingress of water.

Discharge
No special requirements.

Clean-up
No special requirements.

Emergency Procedures

Special emergency equipment to be carried Self-contained breathing apparatus and combined or individual oxygen and carbon monoxide meters should be available.
Emergency procedures Nil **Emergency action in the event of fire** Batten down; use ship's fixed firefighting installation, if fitted. Exclusion of air may be sufficient to control fire. Extinguish fire with carbon dioxide, foam or water. **Medical first aid** Refer to the Medical First Aid Guide (MFAG), as amended.

* Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27)."

"**SYNTHETIC CALCIUM FLUORIDE**

Description
Odourless white-light brown material containing up to 70-80% calcium fluoride, 5-10% aluminium fluoride and 10-20% silicon dioxide.

The product consists of large particles and lumps which may break up during transport generating powder.

The product is insoluble in water.

Characteristics

Angle of repose	Bulk density (kg/m3)	Stowage factor (m3/t)
Not applicable	700 to 900	1.11 to 1.43
Size	**Class**	**Group**
Up to 30 mm	Not applicable	A

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.

This cargo is non-combustible or has a low fire-risk.

Stowage & segregation
"Separated from" hydrofluoric acid, chlorine fluoride, manganese fluoride and oxygen difluoride.

Hold cleanliness
No special requirements.

Weather precautions
When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

Precautions
Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress of the cargo. Due consideration shall be paid to protect equipment from the dust of the cargo.

Ventilation
No special requirements.

Carriage
The appearance of the surface of the cargo shall be checked regularly during the voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate action to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**SYNTHETIC SILICON DIOXIDE**

Description:
Odourless white powder containing up to 85% silicon dioxide, about 7% aluminium fluoride and up to 8% crystal water in dry weight.
The product has very low solubility in water.

Characteristics:

Angle of repose	Bulk density (kg/m3)	Stowage factor (m3/t)
Approximately 40°	300 to 500	2.00 to 3.33
Size	**Class**	**Group**
Up to 0.1 mm	Not applicable	A

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.
This cargo is non-combustible or has a low fire-risk.

Stowage & segregation
"Separated from" hydrofluoric acid, chlorine fluoride, manganese fluoride and oxygen difluoride.

Hold cleanliness
No special requirements.

Weather precautions
When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

Precautions
Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress of the cargo.

Due consideration shall be paid to protect equipment from the dust of the cargo.

Ventilation
No special requirements.

Carriage
The appearance of the surface of the cargo shall be checked regularly during the voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate action to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
No special requirements."

"**TITANOMAGNETITE SAND**

Description
Titanomagnetite Sand has a nominal iron content of 57%.

Characteristics

Angle of repose	Bulk density (kg/m3)	Stowage factor (m3/t)
Not Applicable	2,740 to 2,820	0.35 to 0.36
Size	**Class**	**Group**
Up to 0.4 mm	Not applicable	A

Hazard
This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.
This cargo is non-combustible or has a low fire-risk.

Stowage & Segregation
No special requirements.

Hold Cleanliness
No special requirements.

Weather Precautions
When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

.1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;

.2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

.3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;

.4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and

.5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

Loading
Cargo shall be trimmed to avoid steep surfaces of cargo that could collapse during voyage. As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo.

Precautions
Bilge wells shall be clean, dry and covered to prevent ingress of cargo. Bilge covers shall not significantly degrade the capacity or operation of the bilge system. Bilges shall be sounded and pumped out, as necessary, throughout the voyage.

Ventilation
No special requirements.

Carriage
Unless this cargo is carried in a ship complying with the requirements in subsection 7.3.2 of this Code, the appearance of the surface of the cargo shall be checked regularly during the voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate action to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

Discharge
No special requirements.

Clean-up
After discharge of this cargo, the bilge wells shall be checked and any blockage shall be removed. If the ship is fitted with a de-watering system of the cargo spaces, after discharge of this cargo, the system shall be checked and any blockage in the systems shall be removed."

APPENDIX 2

Laboratory test procedures, associated apparatus and standards

1 Test procedures for materials which may liquefy and associated apparatus

192 In the beginning of the first sentence, replace the term "Three" with "Five". After the sentence "As each method has its advantages, the selection of the test method should be determined by local practices or by the appropriate authorities", add two new sub-paragraphs as follows:

.4 Modified Proctor/Fagerberg test procedure for Iron Ore Fines; and

.5 Modified Proctor/Fagerberg test procedure for Coal.

193 Add a new paragraph 1.5 as follows:

"**1.5 Modified Proctor/Fagerberg test procedure for Coal**

1.5.1 Scope

This procedure details the laboratory determination of Transportable Moisture Limit (TML) for coals up to a nominal top size of 50 mm. The procedure is based on a modification of the Proctor/Fagerberg test described in section 1.3 of this appendix.

Key modifications to the original test procedure contained in section 1.3 of this appendix are:

.1 Sample preparation to facilitate the testing of 0 x 50 mm coal through reconstitution to -25 mm;

.2 Use of a 150 mm diameter compaction cylinder; and

.3 Sample compaction using a hammer equivalent to the Proctor/Fagerberg "D" energy hammer.

The Transportable Moisture Limit is the moisture content corresponding to the intersection of the 70% degree saturation curve and the test sample compaction curve.

In the case of coals where moisture freely drains from the sample such that the test sample compaction curve does not extend to or beyond 70% saturation, the test is taken to indicate a cargo where water passes through the spaces between particles and there is no increase in pore water pressure. Therefore, the cargo is not liable to liquefy. (See subsection 7.2.2 of this Code).

The procedure commences with a drum of coal containing a sample of not less than 170 kg delivered to the testing laboratory and terminates with the laboratory reporting the test result for the coal. Details of the sample collection process are excluded from this procedure. However it is important that the sample accurately represents the size distribution of the cargo and reference should be made to the normative reference list below.

1.5.2 Normative references

The following documents are referenced in this procedure. For dated references, only the cited edition applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

– AS 1289.3.5.1:2006, Methods of testing soils for engineering purposes. Method 3.5.1: Soil classification tests – Determination of the soil particle density of a soil – Standard method;

– ISO 589:2008, Hard Coal – Determination of total moisture;

– ISO 3319-2:2013, Test requirements and testing – Part 2: Test sieves of perforated metal plate; and

– ISO 13909-4:2001, Hard coal and coke – Mechanical sampling – Part 4 – Coal – Preparation of test samples.

1.5.3 Definitions

(1) Transportable Moisture Limit (TML)

The Transportable Moisture Limit (TML) of a cargo which may liquefy means the maximum moisture content of the cargo which is considered safe for carriage in a ship not complying with the requirements in subsection 7.3.2 of this Code.

(2) Test outcomes

The Transportable Moisture Limit determined by this procedure is the moisture content corresponding to the intersection of the 70% degree saturation curve and the test sample compaction curve. This is also referred to as the PFD70 value (Proctor/Fagerberg – D energy hammer – 70% saturation).

Where moisture freely drains from the sample or the cylindrical mould at moisture content such that the test sample compaction curve does not extend to or beyond 70% saturation (as described in paragraph 1.5.5.3(4)), the test is taken to indicate a cargo where water passes through the spaces between particles and there is no increase in pore water pressure. Therefore, the cargo is not liable to liquefy. (See subsection 7.2.2 of this Code).

(3) Optimum Moisture Content (OMC)

The Optimum Moisture Content is the moisture content corresponding to the maximum compaction (maximum dry density) under the specified compaction condition.

(4) Gross water content or total moisture (W^1)

The moisture content of a sample is calculated as the mass of water divided by the total mass of solids plus water and is referred to as either the gross water content or the total moisture content. Gross water content is to be determined using the method for determining total moisture defined in the standard ISO 589:2008.

1.5.4 Determination of the TML of blends of two or more coals

In circumstances where a shipper intends to load a cargo consisting of a blend of two or more coals, the shipper may:

.1 determine the TML of the blend by direct application of the test method described within this procedure to a representative sample of the blended product; or

.2 declare the TML of the blend based on TML determinations on each of the component coals.

.1 Where all component coals in the blend are known to be Group A and B coals:

.1.1 The blended cargo should be declared as Group A and B, and

.1.2 The TML of the blended cargo should be determined as the lowest TML value of any of the component coals.

.2 Where a Group A and B cargo component is blended with a coal which is designated as Group B only:

.2.1 The blended cargo should be declared as Group A and B, and

.2.2 The TML should be taken as the lowest TML of the Group A and B component coals contained within the blend.

.3 Where all component coals are determined to be Group B only coals, the blended cargo may be declared as a Group B only cargo.

1.5.5 Modified Proctor/Fagerberg test procedure for coal

1.5.5.1 Apparatus

(1) Work area

The work area should be located where the samples are protected from excessive temperatures, air currents and humidity variations. All samples should be stored in suitable sample containers, including plastic sample bags, and the containers should be sealed.

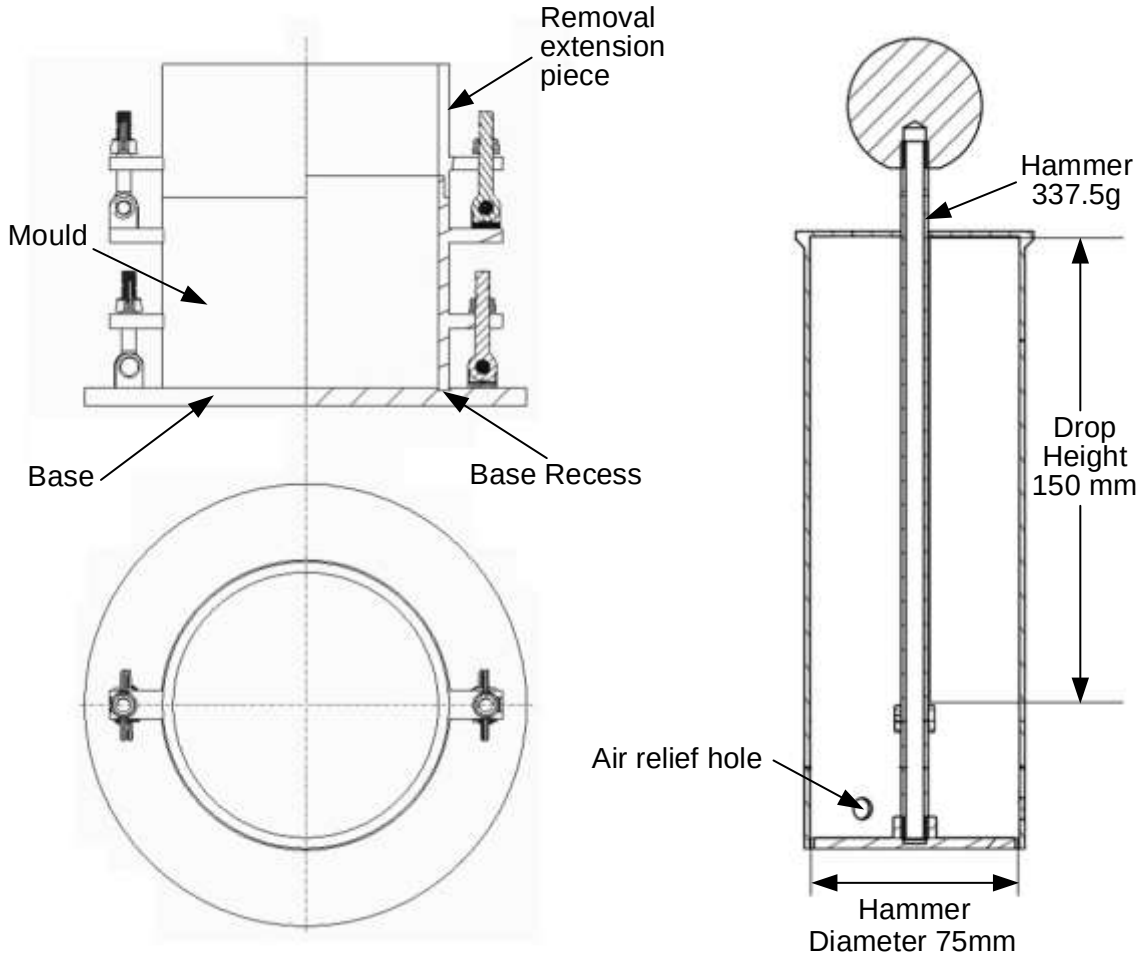
(2) Standard sieves

Square aperture laboratory sieves of 16 mm and 25 mm aperture as nominated in ISO 3319-2:2013 are required for reconstitution of the sample at 25 mm top size. A 2.36 mm sieve is required for generation of + 2.36 mm and –2.36 mm fractions for particle density determination. Optionally a 2 mm sieve may be used for this purpose.

(3) Proctor/Fagerberg apparatus

The Proctor/Fagerberg apparatus consists of a cylindrical stainless steel mould having 150 mm diameter and 120 mm height with a removable extension piece (the compaction cylinder) and a compaction tool guided by a pipe at its lower end (the compaction hammer), which are shown in figure 1.5.1. A schematic diagram of the Proctor/Fagerberg apparatus is shown in figure 1.5.2 with dimensions and tolerances indicated in table 1.5.5.

Figure 1.5.1 Example of Proctor/Fagerberg test apparatus, hammer and hammer guide



Compaction Cylinder **Compaction Hammer**

Figure 1.5.2 Schematic of a Proctor/Fagerberg apparatus

(4) Compaction hammer

A "D" energy equivalent compaction hammer is used for this test. Dimensions are shown in figure 1.5.2 and table 1.5.5. (Note: the compaction hammer has been modified to match the mould used.)

(5) Drying oven

The drying oven should be ventilated, with forced circulation of air or inert gas, typically with a stainless steel interior and capable of maintaining a temperature within the range of 105°C ± 5°C.

(6) Weighing balance

The weighing balance should be capable of weighing the sample and the container, as received, with an accuracy of better than ± 5 g.

(7) Pycnometer

Water pycnometry equipment is used to determine the density of the full sized coal (non-crushed) in accordance with AS 1289.3.5.1:2006. Specific equipment required is as follows:

- a conical flask or density bottle of 250 ml capacity;
- a vacuum desiccator or other vacuum equipment;
- a drying oven set to 105°C to 110°C;
- balances – one with ± 0.05 g accuracy and the second with ± 1 g accuracy;
- a 0°C to 100°C thermometer;
- a 2.36 mm sieve (as noted in paragraph 1.5.5.1(2))
- a vacuum source;
- a water bath set at 60°C;
- distilled, demineralized or deionized water;
- a wash bottle containing water;
- a wire basket to hold the + 2.36 mm sample;
- a container filled with water to hold the wire basket without interference; and
- a scale to weigh the basket both suspended in water and drained.

(8) Containers for hand mixing and sample preparation

Sufficient heavy-duty plastic buckets with lids of not less than 10 litres capacity are required for storage and handling. Heavy-duty plastic bags (200 micron thick or greater) are required for storage and hand mixing of samples.

(9) Flat scraping device

A thin steel scraper is required for separating the remnant sample formed in the extension piece lying above the top level of the mould. For ease of use, the scraper should have dimensions of 160 mm wide, 200 mm long and 3 mm to 5 mm thick, such as that shown in figure 1.5.3.

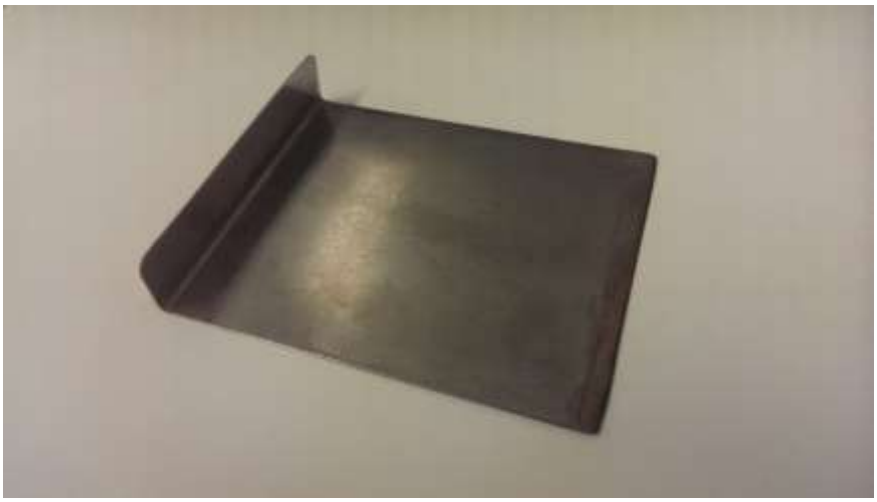


Figure 1.5.3 Typical scraping device

(10) Drying trays

Drying trays or pans should have a smooth surface, be free from contamination and heat resistant, for example stainless steel or enamel. Dimensions should be suitable to fit in the drying oven and ensure that the total sample can be contained at a loading of about 1 g/cm^2 of surface area.

(11) Spray bottle

A suitable plastic bottle is required to add a mist spray of water to the sample.

(12) Gloves

Heat resistant gloves are required for removal of hot trays and dishes.

(13) Sample divider

A suitable sample divider as specified in ISO 13909-4:2001 is required for sub-sampling the primary sample and blending the reconstituted sample for testing.

1.5.5.2 Sampling and sample preparation

(1) General

This procedure commences with receipt of sample of not less than 170 kg, sealed in a heavy duty (200 micron thick) plastic bag and contained in a suitable drum (e.g. 220 litres). This packaging ensures the sample does not dry prior to TML determination.

(2) Sample preparation

Representative samples are required that have been obtained using ISO 13909-4:2001 and if required may be partially air dried or partially dried at a temperature of 40°C or less to reduce the water content to a starting point suitable for dry sieving the coal with minimal fines adhering to the oversize fraction. For this purpose, samples should not be dried below 6% total moisture. The representative subsamples for the test should not be fully dried, except in the case of gross water content determination.

(2.1) Sample homogenization and division

Take the as-received sample and divide into individual sub-samples using a sample dividing apparatus as specified in ISO 13909-4:2001. Place these subsamples into heavy-duty plastic bags.

(2.2) Reconstituted sample preparation procedure

When the sample contains particles above 25 mm, the reconstitution process below should be applied.

In this process, particles above 25 mm are removed from the sample and replaced by an equivalent mass of particles in the range 16 mm to 25 mm. Through this process a final reconstituted sample of sufficient mass for TML testing is generated which contains a maximum particle size of 25 mm.

One of two methods may be selected to generate the reconstituted sample:

.1 Split the entire as-received sample and then reconstitute; or

.2 Scalping off particles above 25 mm and substituting particles between 16 mm and 25 mm from a separate sub-sample.

Method 1 Splitting the full as received sample and reconstitution

(i) Take the full as-received sample;

(ii) Screen at 25 mm, 16 mm and 2.36 mm. If a 2.36 mm screen is not available, a 2 mm screen may be used;

(iii) Weigh each of the four size fractions and calculate the percentage represented by each size fraction;

(iv) Sub-divide from each size fraction below 25 mm the required mass to create a 25 kg reconstituted sample using the sample size components specified in table 1.5.1:

Table 1.5.1 Reconstitution size proportions (Method 1)

Size fraction	Quantity
-2.36 mm (or -2 mm)	percentage of this fraction in the original sample
2.36 mm (or 2 mm) to 16 mm	percentage of this fraction
16 mm to 25 mm	percentage of this fraction plus the percentage of + 25 mm coal

(v) Combine each size fraction;

(vi) Fully mix the reconstituted sample;

(vii) Split the sample into approximately eight representative sub-samples and place each into a heavy duty plastic bag. These bags now contain the sample for Proctor/Fagerberg testing.

(viii) A sample of particles passing a 2.36 mm screen (or 2.0 mm if 2.36 mm is not available) is required for particle density pycnometry.

Method 2 Scalping particles above 25 mm and replacement with 16 mm to 25 mm particles

This method is described in figure 1.5.4 and table 1.5.2. The reconstitution process commences where the coal is initially sieved into particle sizes larger than 25 mm and smaller than 25 mm. Coal particles in the size range of 16 mm to 25 mm are extracted from separate subsamples and reconstituted back into the original -25 mm screened coal based on a mass equivalent to the + 25 mm sized coal removed from the initial sample to provide a final reconstituted sample of sufficient mass for TML testing.

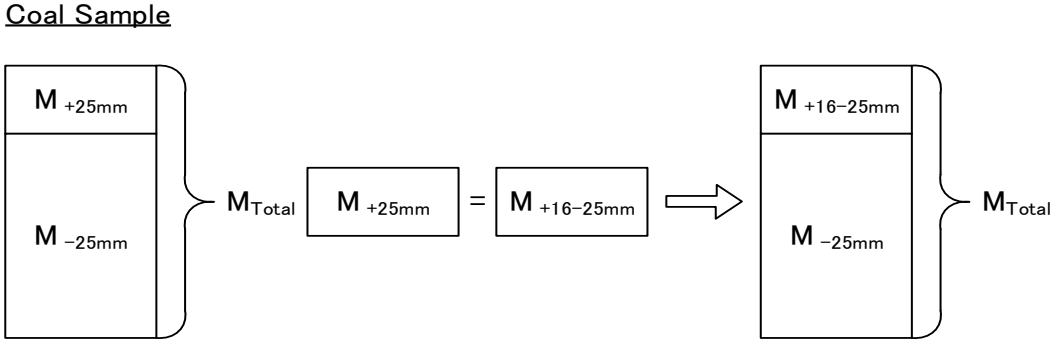


Figure 1.5.4 Overview of sample reconstitution (Method 2)

Table 1.5.2 Sample reconstitution (Method 2)

Step	Example
a) Generate a sample of approximately 25 kg which is sufficient to complete approximately eight Proctor/Fagerberg tests.	Assumes each subsample bag contains 8 kg to 10 kg.
b) Screen this sample at 25 mm, ensuring minimal adhering fines on the +25 mm fraction. Weigh the +25 mm coal.	For a coal containing 20% +25 mm material, approximately 5 kg of initial sample is removed.
c) Create sufficient 16 mm to 25 mm coal by screening one or more further subsample bags of coal at 16 mm and 25 mm.	In the above example, 5 kg of 16 mm to 25 mm coal is required.
d) Extract an amount of 16 mm to 25 mm coal of mass equal to the mass of +25 mm removed in step b) within ± 0.05 kg using a rotary sample divider or similar device, recombining sector trays as required to obtain the required mass.	5 kg in the above case.
e) Add the mass of 16 mm to 25 mm coal from step d) to the -25 mm coal from step b). Blend and divide into approximately eight test portions using a rotary sample divider or similar device.	
f) Place each reconstituted test portion in heavy duty plastic bags, label and seal. **These now become the test portions used for Proctor/Fagerberg testing.**	Each bag should contain approximately 2.5 kg to 3 kg of reconstituted -25 mm coal.
g) Discard the +25 mm and -16 mm coal.	

(3) Initial moisture

Initial moisture is to be determined on a test portion from table 1.5.2 step e) using the method provided in ISO 589:2008. This moisture value provides a guide to the moisture steps required to develop the Proctor/Fagerberg compaction curve.

(4) Particle density measurement

In accordance with water pycnometer standard AS 1289.3.5.1:2006, measure the density of solids on the full size range (non-crushed) coal. The density of solids is used for determining the void ratio for plotting compaction curves. The recommended methodology is described below:

(a) Generate a full particle size sample of approximately 10 kg, weigh and then screen the entire contents at 2.36 mm. If a 2.36 mm screen is not available, a 2 mm screen may be substituted. Record the following:

(i) The total mass of the material;

(ii) The mass of +2.36 mm material; and

(iii) The mass of -2.36 mm material.

(b) Calculate the percentage of -2.36 mm coal in the sample.

(c) Divide the +2.36 mm coal into two test portions using sample dividing apparatus as specified in ISO 13909-4:2001 such as a rotary sample divider. Place each test portion in a heavy duty plastic bag and label.

(d) Divide the -2.36 mm coal into two test portions, place each test portion in a heavy duty plastic bag and label.

(e) Determine the density of solids of the +2.36 mm fraction following the method described in Section 5.2 of AS 1289.3.5.1:2006. As noted in the standard, duplicate determinations are required.

(f) Determine the density of solids of the -2.36 mm fraction using the method described in Section 5.1 of the above standard with the following clarifications:

(i) Use of 250 mm conical or pycnometry flasks is recommended.

(ii) From the sample bag pour 1 litre of coal into a beaker of known tare weight.

(iii) Weigh the 1 litre sample and calculate the approximate bulk density of the material.

(iv) Remove a portion of the sample (nominally a mass in kilograms of 0.18 x bulk density) and place into the flask, and complete the pycnometry analysis.

(v) A water bath temperature of 60°C is recommended.

(g) Calculate the density of solids using the method in Section 6 of AS 1289.3.5.1:2006.

1.5.5.3 Test procedure

(1) Variables and definitions

The variables and definitions used in the determination of TML are summarized in table 1.5.3 with some key variables as illustrated in figure 1.5.5.

Table 1.5.3 Summary of variables and definitions

Variable	Unit	Symbol / value used in calculations
Mass of empty cylinder and base	g	A
Mass of cylinder, base and tamped test portion	g	B
Wet mass of test portion in the mould	g	$C = B - A$
Wet mass of test portion removed from the mould	g	C_1
Dry mass of test portion removed from the mould	g	D_1
Gross water content	%	W^1
Dry mass of test portion in the mould	g	D
Mass of water in the mould	g	E
Volume of cylinder	cm^3	V
Density of solids	g/cm^3	d
Density of water	g/cm^3	ρ_w

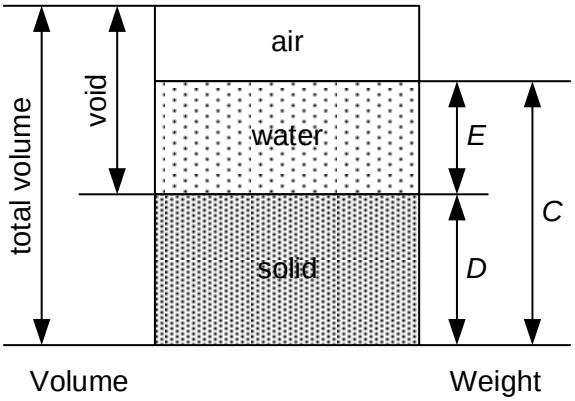


Figure 1.5.5 Illustration of key variables

(2) Establishment of the initial compaction point

The initial compaction point is obtained using the first test portion of the reconstituted material at the initial moisture content. For each compaction point determination, all steps in the procedure from packing the mould to weighing the mould and sample are to be completed at the same time without breaks. In any case, coal should not be left in the mould for longer than thirty minutes prior to weighing.

The test procedure is as follows:

(a) Clean the mould, collar and base plate. Inspect and clean the hammer and ensure that it moves freely in the guide tube.

(b) Determine the mass, *A*, of the empty cylinder, comprising the mould plus base plate.

(c) Assemble the mould, collar and base plate and place the assembly on a stable bench.

(d) Place approximately 0.5 litre (one fifth of the full 2.5 litres) of the test portion into the mould, level, and then tamp uniformly over the surface by dropping the hammer 25 times vertically through the full height of the guide pipe, moving the guide pipe to a new position after each drop. The required pattern for even compaction of each layer in the mould is shown in figure 1.5.6.

(e) Repeat step (d) four more times so that there are 5 layers of material in the mould. Ensure that the compacted test portion with the final layer is above the top of the compaction mould whilst the extension piece is still attached.

(f) When the last layer has been tamped, remove the extension piece taking care not to disturb the compacted test portion inside. Level the compacted test portion to the top of the mould using the flat scraping device, ensuring that any large particles that may hinder levelling of the test portion are removed and replaced with material contained in the extension piece and re-level. If any holes in the surface are still observed after levelling, they should be manually filled with finer material contained in the extension piece. Care should be taken to avoid any further compaction of the test portion.

(g) Determine the mass, *B*, of the mould and compacted coal and then calculate the mass, *C*, of the wet test portion using the equation:

$$C = B - A \quad (1)$$

(h) When the weight of the cylinder with the tamped test portion has been determined, remove the test portion from the mould, determine the mass of the wet test portion, C_1, and dry the entire test portion in an oven at 105°C until constant mass is achieved. After drying, determine the weight, D_1, of the dried test portion and then calculate the percentage gross water content, W^1, as follows:

$$W^1 = (C_1 - D_1)/C_1 \times 100\% \quad (2)$$

(i) Using the calculated gross water content, calculate the mass of the dry test portion in the mould, D, using the equation:

$$D = C - C \times W^1/100 \quad (3)$$

(j) Calculate the mass, E, of water in the mould using the equation:

$$E = C - D \quad (4)$$

(k) Discard the used coal sample. Coal from a previously compacted test portion should not be reused.

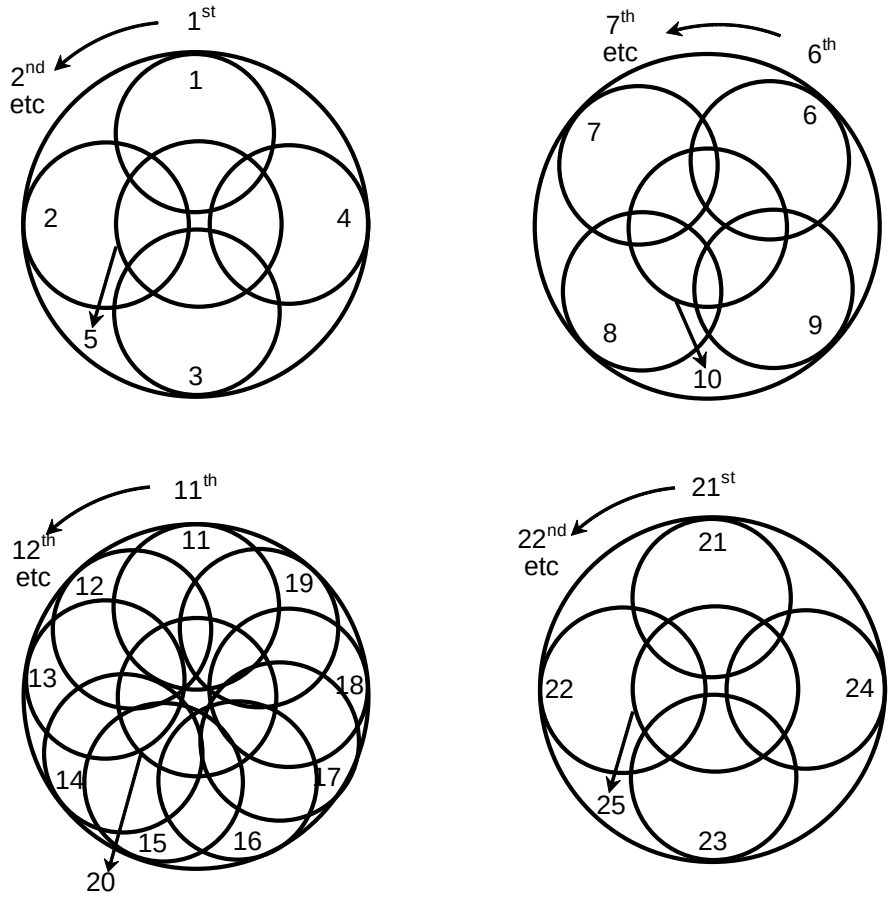


Figure 1.5.6 Recommended compaction patterns

(3) Establishment of complete compaction curve

The range of water contents should be adjusted so that partially dry to almost saturated test portions are obtained. Care should be taken to follow the precaution in paragraph 1.5.5.3(2) above regarding prompt completion of each point in the compaction curve.

The test procedure is as follows:

(a) For each compaction test, a predetermined amount of water is added to the test portion (approximately 2.5 kg) in a heavy duty plastic bag. The water quantity added is that required to increase the moisture content to the target value for the next test. The water should be added as a mist spray to the surface of the individual test portions. The water at this point should be added slowly and in small quantities, as the introduction of large amounts of water may induce localized compaction behaviour.

(b) After the calculated water addition, the test portion should then be mixed thoroughly in the plastic bag by sealing the bag and turning it over repeatedly for 5 minutes.

(c) The test portion should then be allowed to equilibrate for a minimum of 12 hours prior to compaction testing.

(d) Repeat steps (a) to (k) from paragraph 1.5.5.3(2).

(e) Repeat the test between four and seven times using the other prepared test portions with different water contents to obtain at least five points on the compaction curve. The water contents should be chosen so that:

.1 at least one point corresponds to moisture content higher than the Optimum Moisture Content (OMC) or than the value corresponding to 70% of degree of saturation (S), in order to satisfactorily define the compaction curve; and

.2 at least one point corresponds to the degree of saturation (S) between 70% and 80%, in order to effectively assess the PFD70 value.

A point close to a degree of saturation (S) of 80% will also assist accurate assessment if the OMC is greater than 70%.

(4) Visual appearance of coal in the cylindrical mould

In order for the test to obtain a PFD70 value, all tests conducted at or below the PFD70 moisture value should have an even moisture distribution throughout the cylindrical mould.

Two examples of tests using samples of the same coal at different moisture contents are shown in figure 1.5.7. The left hand photograph shows a coal specimen at a relatively low degree of saturation. Note that the coal remains in place following removal of the collar. The right hand photograph shows a specimen near or possibly above 70% degree of saturation. Once again the coal remains in place following removal of the collar. Both tests provided valid points on the compaction curve.

Figure 1.5.7 Photographs showing valid tests for a partially saturated test portion (left) and a near fully saturated test portion (right)

Coals where water passes through the spaces between particles exhibit moisture migration within the Proctor/Fagerberg cylindrical mould. Moisture migration may take place when the degree of saturation of the specimen is less than 70%.

Evidence of moisture migration is from visual observation at the completion of each test as follows:

.1 Moisture leakage from the base of the mould is evident as shown in figure 1.5.8; and

.2 The portion above the top of the cylindrical mould appears unsaturated and the test portion maintains its structure without deformation or movement.

In this case, moisture migration has occurred and hence for this coal water passes through the spaces between particles.

Figure 1.5.8 Test showing water leakage from the base of the cylindrical mould indicating moisture migration

(5) Calculation of key parameters for determination of compaction curve

Carry out the following calculations for each compaction test:

d = density of solids, g/cm^3 (t/m^3) by pycnometry (see 1.5.5.2(4)).

γ = dry bulk density, g/cm^3 (t/m^3)
= D/V

e_v = net water content (percentage by volume)
= $(E/D) \times 100 \times d/\rho_w$

where ρ_w= density of water, g/cm^3 (t/m^3)

e = void ratio (volume of voids divided by volume of solids)
= $(d/\gamma) - 1$

S = degree of saturation (percentage by volume)
= e_v/e

W[1] = gross (total) water content (percentage by mass) (see 1.5.5.3(2)(h)).

(6) Presentation of compaction results

Record all the compaction test results in a suitable spreadsheet (such as that shown in table 1.5.4) and from this spreadsheet create a compaction curve as shown in figure 1.5.9 by plotting the calculated void ratio (e) for each compaction test on the ordinate against either the net or gross water content plotted on the abscissa.

The lines in figure 1.5.9 correspond to plots of void ratio (e) versus net water content (e_v) at 20%, 40%, 60%, 70%, 80% and 100% degree of saturation (S). These lines are calculated at five values of void ratio using the formulae in section 1.5.5.3(7). (Note: These lines corresponding to degree of saturation will be curved in the case of plotting gross water content on the abscissa.)

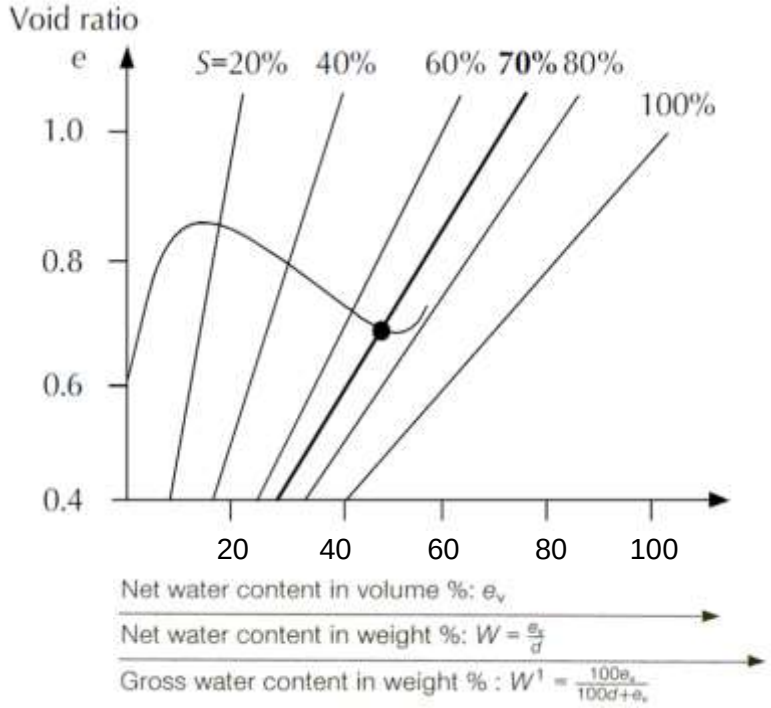


Figure 1.5.9 Typical compaction curve

(7) Sample compaction curve

An example of the results obtained when applying the Modified Proctor/Fagerberg test to a coal sample is provided in table 1.5.4, with the corresponding compaction curve and the 70% degree of saturation line plotted as described below.

The preferred approach to presenting the results is to plot the void ratio (e) against the gross water content (W^1) allowing moisture for any saturation level to be read directly from the plot as gross water content. This approach is shown in figure 1.5.10. The saturation lines are plotted according to the equation:

$$e = W^1/(100 - W^1) \times 100 \times d / S$$

The intercept of the compaction curve with the 70% degree of saturation line in figure 1.5.10 occurs at a gross water content of 15.4%, which is the Transportable Moisture Limit (TML). For this example, the Optimum Moisture Content (OMC) occurs at a degree of saturation of about 85%.

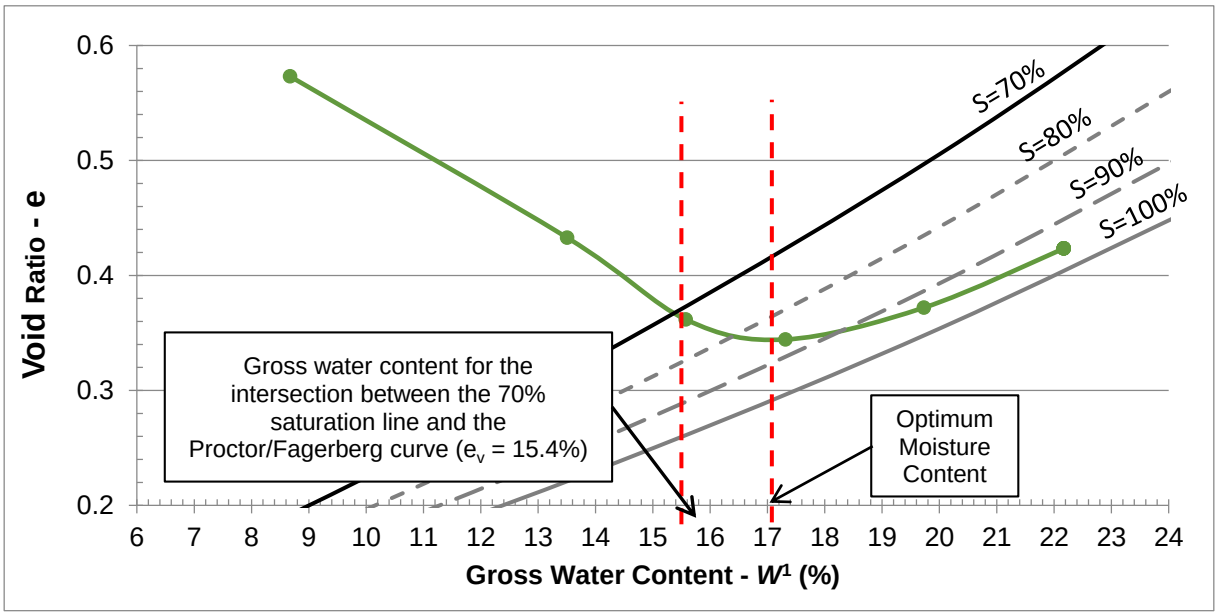


Figure 1.5.10 Example of a measured compaction curve for void ratio versus gross water content with the 70%, 80%, 90% and 100% degree of saturation lines plotted

(8) Determination of transportable moisture limit

(8.1) Determination of PFD70 moisture content

The PFD70 value is determined as the gross (total) water content corresponding to the intersection of the compaction curve and the line S = 70% saturation. The Optimum Moisture Content (OMC) is the gross (total) moisture content corresponding to the maximum compaction (maximum dry density and minimum void ratio) under the specified compaction condition.

The test procedure is applicable for determination of coal TML where the degree of saturation corresponding to the OMC of the coal is at or greater than 70%. Where the OMC lies below 70% degree of saturation, this test is not applicable for the specific coal and the PFD70 may overstate the TML. In such cases, the certificate of analysis should state that the OMC is below 70% saturation and the shipper should consult with an appropriate authority.

(8.2) Cases where the highest determinable point on the compaction curve lies below 70% saturation

In coals where there is visual evidence that water passes through the spaces between particles and the compaction curve does not extend to or beyond the 70% degree of saturation line, the coal is deemed to be free-draining and a TML value is not applicable. By reference to section 7.2.2 of this Code, such coals are cargoes which are not liable to liquefy, and hence are classified as Group B only.

1.5.6 Test report

The test report from application of the Modified Proctor/Fagerberg test procedure should include the following information:

(a) Identification of the sample;

(b) A unique reference to this test procedure;

(c) Reference to the appropriate standard adopted for determining the density of the solids:

(d) Either:

(i) The Transportable Moisture Limit (TML) of the sample, expressed as the gross water content as a percentage of the sample by mass;

(ii) The OMC lies below 70% degree of saturation and this test procedure is not applicable; or

(iii) A statement that the test indicated that water passes through the spaces between particles at moisture content below the value corresponding to 70% degree of saturation, and the coal is therefore Group B only.

(e) The solids density d in g/cm^3.

Table 1.5.4 Example of TML determination for a coal sample using the Modified Proctor/Fagerberg test procedure for coal

Date		Diameter of cylinder	150 mm
Product		Height of cylinder	120 mm
Sample		Volume of cylinder	2121 ml
Initial gross water content (%)	5.6	TML	15.4%
Density of solids	1416 kg/m^3		
Laboratory temperature	25°C	Size fraction	
Mass of mould (***A***)	7271 g	Operator	
Initial Dry density	899 kg/m^3	Tamper	337.5 g

Test number	Water added	Mass of mould + sample	Tray No.	Mass of tray	Mass of wet sample + tray	Mass of dry sample + tray	Measured gross water content	Gross water content	Net water content	Void ratio	Dry density	Degree of saturation	Wet bulk density	Mass of wet sample	Mass of dry sample	Mass of water
	(ml)	(g)		(g)	(g)	(g)	(%)	(%)	(%v)		(g/cm^3)	(%)	(g/cm^3)	(g)	(g)	(g)
		B						W^1	e_V	***e***	γ	***S***		***C***	***D***	***E***
1	0.00	9360.00	T1	602.5	1656.8	1565.7	8.64	8.67	13.437	0.573	0.899	23.4	0.985	2089.0	1907.8	181.2
			T2	602.3	1643.1	1552.5	8.70									
2	150.00	9692.70	T3	630.7	1811.7	1649.6	13.73	13.51	22.097	0.433	0.988	51.1	1.142	2421.7	2094.6	327.1
			T4	882.9	2126.9	1961.6	13.29									
3	250.00	9881.60	T5	638.7	2081.4	1849.7	16.06	15.58	26.104	0.362	1.039	72.2	1.231	2610.6	2204.0	406.6
			T6	632.4	1822.6	1643.0	15.09									
4	350.00	9971.00	T7	882.2	2349.9	2095.4	17.34	17.31	29.630	0.344	1.053	86.1	1.273	2700.0	2232.5	467.5
			T8	637.9	1868.8	1656.0	17.29									
5	450.00	9996.20	T9	654.3	2013.2	1746.5	19.63	19.73	34.780	0.372	1.031	93.5	1.285	2725.2	2187.5	537.7
			T10	639.6	1999.4	1729.7	19.83									
6	550.00	9980.00	T11	885.0	2251.5	1931.6	23.41	22.17	40.311	0.423	0.994	95.2	1.277	2709.0	2108.4	600.6
			T12	883.5	2181.9	1910.1	20.93									
7																
8																
9																
10																

Note: The example above uses two drying trays for each test.

Table 1.5.5 Specifications and tolerances for Proctor/Fagerberg cylindrical mould and hammer

Parameter	Units	Dimension	Tolerance
Hammer mass	g	337.5	± 2
Hammer diameter	mm	75	± 0.2
Drop height	mm	150	± 2
Tube ID	mm	78	± 0.2
Tube OD	mm	82	± 0.2
Tube wall thickness	mm	2	± 0.2
Tube clearance	mm	1.5	± 0.2
Mould inner diameter	mm	150	± 0.5
Mould inner height	mm	120	± 1
Mould inner volume	cm^3	2121	± 18
Removable extension piece height	mm	75	± 1
Depth of recess into base to seat	mm	1	± 0.2
Gap between mould and base	mm	≤ 0.1	
Gap between mould and extension piece	mm		(0 to + 0.1)
Clearance between mould and hammer	mm	≤ 6	

"

APPENDIX 3

Properties of solid bulk cargoes

1 Non-cohesive cargoes

1.1 The following cargoes are non-cohesive when dry:

194 In the list, add the following new entries in alphabetical order:

"MONOAMMONIUM PHOSPHATE (M.A.P.), MINERAL ENRICHED COATING"
"MONOCALCIUMPHOSPHATE (MCP)"
"OLIVINE SAND"
"OLIVINE GRANULAR AND GRAVEL AGGREGATE PRODUCTS"
"SAND, MINERAL CONCENTRATE, RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) UN 2912"
"SUGARCANE BIOMASS PELLETS"
"SYNTHETIC SILICON DIOXIDE"

APPENDIX 4

INDEX

195 In the entry for "ILMENITE SAND", in the column of "Group", delete the words "or C".

196 Insert the following new entries in alphabetical order:

Material	Group	References
Beach iron	C	*see* IRON SMELTING BY-PRODUCTS
Bottom ash	A and B	*see* CLINKER ASH
Flat iron	C	*see* IRON SMELTING BY-PRODUCTS
Flint flat glass cullet	C	*see* GLASS CULLET
FOAM GLASS GRAVEL	C	
Granulated iron	C	*see* IRON SMELTING BY-PRODUCTS
K1-K3 bears	C	*see* IRON SMELTING BY-PRODUCTS
Iron pan edges	C	*see* IRON SMELTING BY-PRODUCTS
Iron skulls	C	*see* IRON SMELTING BY-PRODUCTS
IRON SMELTING BY-PRODUCTS	C	
METAL SULPHIDE CONCENTRATES, CORROSIVE UN 1759	A and B	
MONOAMMONIUM PHOSPHATE (M.A.P.), MINERAL ENRICHED COATING	B	
MONOCALCIUMPHOSPHATE (MCP)	A and B	
OLIVINE SAND	A	
OLIVINE GRANULAR AND GRAVEL AGGREGATE PRODUCTS	C	
Pig iron by-product	C	*see* IRON SMELTING BY-PRODUCTS
Plate iron	C	*see* IRON SMELTING BY-PRODUCTS
Pool iron	C	*see* IRON SMELTING BY-PRODUCTS
SAND, MINERAL CONCENTRATE, RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) UN 2912	A and B	
Separation of iron	C	*see* IRON SMELTING BY-PRODUCTS
Silicon dross	C	*see* SILICON SLAG
Steel bears	C	*see* IRON SMELTING BY-PRODUCTS
SUGARCANE BIOMASS PELLETS	B	
SYNTHETIC CALCIUM FLUORIDE	A	
SYNTHETIC SILICON DIOXIDE	A	
TITANOMAGNETITE SAND	A	

"

APPENDIX 5

Bulk Cargo Shipping Names in three languages (English, Spanish and French)

197 In Appendix 5 insert the following new entries in the corresponding alphabetical order:
"

ENGLISH	FRENCH	SPANISH
Beach iron	Fer de type grès dits "beach iron"	Hierro de tipo arenisco conocido como ("beach iron")
Bottom ash	Cendres résiduelles	Cenizas de fondo
Flat iron	Fer plat	Hierro plano
Flint flat glass cullet	Calcin de verre de silex plat	Desperdicios gruesos de vidrio flint
FOAM GLASS GRAVEL	GRANULAT DE VERRE CELLULAIRE	GRAVA DE VIDRIO CELULAR
Granulated iron	Granulats ferreux	Hierro granulado
K1-K3 bears	Pièces en forme d'ours des groupes K1-K3 dites "bears"	Cuescos K1 – K3
Iron pan edges	Fer en forme de poêles dits "Iron pan edges"	Hiero en forma de sartenes denominado ("Iron pan edges")
Iron skulls	Fer en forme de crânes ("iron skulls")	Hierro en forma de cráneos conocido como ("iron skulls")
IRON SMELTING BY-PRODUCTS	PRODUITS DE LA FUSION DU FER	PRODUCTOS DERIVADOS DE LA FUNDICIÓN DEL HIERRO
METAL SULPHIDE CONCENTRATES, CORROSIVE UN 1759	CONCENTRÉS DE SULFURES MÉTALLIQUES, CORROSIFS, ONU 1759	CONCENTRADOS DE SULFUROS METÁLICOS, CORROSIVOS (ONU 1759)
MONOAMMONIUM PHOSPHATE (M.A.P.), MINERAL ENRICHED COATING	MONOPHOSPHATE D'AMMONIUM, REVÊTEMENT ENRICHI EN MINÉRAUX	FOSFATO MONOAMÓNICO CON RECUBRIMIENTO DE MINERAL ENRIQUECIDO
MONOCALCIUMPHOSPHATE (MCP)	PHOSPHATE MONOCALCIQUE EN VRAC	FOSFATO MONOCÁLCICO (MCP)
OLIVINE SAND	SABLE D'OLIVINE	ARENA DE OLIVINO
OLIVINE GRANULAR AND GRAVEL AGGREGATE PRODUCTS	OLIVINE GRANULEUX ET PRODUITS D'AGREGATS DE GRAVIER	PRODUCTOS AGREGADOS GRANULARES Y DE GRAVA DE OLIVINO
Pig iron by-product	Sous-produits de la fonte brute	Productos derivados del hierro en lingotes
Plate iron	Plaques de fer	Placas de hierro
Pool iron	Résidus de hauts fourneaux	Residuos de altos hornos

ENGLISH	FRENCH	SPANISH
SAND, MINERAL CONCENTRATE, RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) UN 2912	MATIÈRES RADIOACTIVES DE FAIBLE ACTIVITÉ SPÉCIFIQUE (LSA-I), ONU 2912, SABLES, CONCENTRÉS DE MINÉRAUX	ARENAS DE CONCENTRADOS DE MINERALES (MATERIAL RADIACTIVO DE BAJA ACTIVIDAD ESPECÍFICA (BAE-I), ONU 2912)
Separation of iron	Résidus du processus de séparation	Residuos del proceso de separación
Steel bears	Pièces d'acier en forme d'ours dites "steel bears"	Cuescos de acero
SILICOMANGANESE (carbo-thermic)	SILICOMANGANÈSE (carbothermique)	SILICOMANGANESO (CARBOTÉRMICO)
SUGARCANE BIOMASS PELLETS	Biomasse de la canne à sucre en pellets	Pellets de biomasa de caña de azúcar
SYNTHETIC CALCIUM FLUORIDE	FLUORURE DE CALCIUM DE SYNTHÈSE	FLUORURO DE CALCIO SINTÉTICO
SYNTHETIC SILICON DIOXIDE	DIOXYDE DE SILICIUM DE SYNTHÈSE	DIÓXIDO DE SILICIO SINTÉTICO
TITANOMAGNETITE SAND	SABLE TITANOMAGNÉTITE	ARENA DE TITANOMAGNETITA

"

***

ANNEX 9

RESOLUTION MSC.427(98)
(adopted on 15 June 2017)

AMENDMENTS TO THE REVISED RECOMMENDATION ON TESTING OF LIFE-SAVING APPLIANCES (RESOLUTION MSC.81(70), AS AMENDED)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.689(17) entitled *Testing of life-saving appliances*, by which the Assembly, at its seventeenth session, adopted the *Recommendation on testing of life-saving appliances*,

RECALLING FURTHER that the Assembly, when adopting resolution A.689(17), authorized the Committee to keep the *Recommendation on testing of life-saving appliances* under review and to adopt, when appropriate, amendments thereto,

NOTING resolution MSC.81(70), by which, at its seventieth session, it adopted the *Revised recommendation on testing of life-saving appliances*, introducing more precise provisions for the testing of life-saving appliances based on the requirements of the International Life-Saving Appliances (LSA) Code,

RECOGNIZING the need to appropriately align the relevant provisions of the *Revised recommendation on testing of life-saving appliances* with the associated amendments to the LSA Code adopted by resolution MSC.425(98),

HAVING CONSIDERED, at its ninety-eighth session, proposed amendments to the *Revised recommendation on testing of life-saving appliances*, prepared by the Sub-Committee on Ship Systems and Equipment at its third session,

1 ADOPTS amendments to the *Revised recommendation on testing of life-saving appliances* (resolution MSC.81(70)), the text of which is set out in the annex to the present resolution;

2 RECOMMENDS Member States to apply the annexed amendments when testing life-saving appliances.

ANNEX

AMENDMENTS TO THE REVISED RECOMMENDATION ON TESTING OF LIFE-SAVING APPLIANCES (RESOLUTION MSC.81(70), AS AMENDED)

Part 1 – Prototype tests for life-saving appliances

8 LAUNCHING AND EMBARKATION APPLIANCES

8.1 Testing of davits and launching appliances

1 The first sentence of paragraph 8.1.1 is amended to read as follows:

"For lifeboats other than free-fall lifeboats, davits and launching appliances, except winches, should be subjected to a static proof load of 2.2 times their maximum working load."

***

ANNEX 10

RESOLUTION MSC.428(98)
(adopted on 16 June 2017)

MARITIME CYBER RISK MANAGEMENT IN SAFETY MANAGEMENT SYSTEMS

THE MARITIME SAFETY COMMITTEE,

RECOGNIZING the urgent need to raise awareness on cyber risk threats and vulnerabilities to support safe and secure shipping, which is operationally resilient to cyber risks,

RECOGNIZING ALSO that Administrations, classification societies, shipowners and ship operators, ship agents, equipment manufacturers, service providers, ports and port facilities, and all other maritime industry stakeholders should expedite work towards safeguarding shipping from current and emerging cyber threats and vulnerabilities,

BEARING IN MIND MSC-FAL.1/Circ.3 on *Guidelines on maritime cyber risk management* approved by the Facilitation Committee, at its forty-first session (4 to 7 April 2017), and by the Maritime Safety Committee, at its ninety-eighth session (7 to 16 June 2017), which provides high-level recommendations for maritime cyber risk management that can be incorporated into existing risk management processes and are complementary to the safety and security management practices established by this Organization,

RECALLING resolution A.741(18) by which the Assembly adopted the International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code) and recognized, inter alia, the need for appropriate organization of management to enable it to respond to the need of those on board ships to achieve and maintain high standards of safety and environmental protection,

NOTING the objectives of the ISM Code which include, inter alia, the provision of safe practices in ship operation and a safe working environment, the assessment of all identified risks to ships, personnel and the environment, the establishment of appropriate safeguards, and the continuous improvement of safety management skills of personnel ashore and aboard ships,

1 AFFIRMS that an approved safety management system should take into account cyber risk management in accordance with the objectives and functional requirements of the ISM Code;

2 ENCOURAGES Administrations to ensure that cyber risks are appropriately addressed in safety management systems no later than the first annual verification of the company's Document of Compliance after 1 January 2021;

3 ACKNOWLEDGES the necessary precautions that could be needed to preserve the confidentiality of certain aspects of cyber risk management;

4 REQUESTS Member States to bring this resolution to the attention of all stakeholders.

***

ANNEX 12

RESOLUTION MSC.429(98)
(adopted on 9 June 2017)

REVISED EXPLANATORY NOTES TO THE SOLAS CHAPTER II-1 SUBDIVISION AND DAMAGE STABILITY REGULATIONS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the function of the Committee,

RECALLING ALSO that, by resolution MSC.216(82), it adopted the regulations on subdivision and damage stability as contained in SOLAS chapter II-1 which are based on the probabilistic concept, using the probability of survival after collision as a measure of ships' safety in a damaged condition,

NOTING that, at the eighty-second session, it approved Interim Explanatory Notes to the SOLAS chapter II-1 subdivision and damage stability regulations (MSC.1/Circ.1226), to assist Administrations in the uniform interpretation and application of the aforementioned subdivision and damage stability regulations,

NOTING ALSO that, at the eighty-fifth session, it adopted the *Explanatory Notes to the SOLAS chapter II-1 subdivision and damage stability regulations* (resolution MSC.281(85)),

NOTING FURTHER that, by resolution MSC.421(98), it adopted amendments to regulations on subdivision and damage stability, as contained in SOLAS chapter II-1,

RECOGNIZING that the Revised Explanatory Notes should be adopted in conjunction with the adoption of the aforementioned amendments to subdivision and damage stability regulations (resolution MSC.421(98)),

RECOGNIZING ALSO that the appropriate application of the Revised Explanatory Notes is essential for ensuring the uniform application of the SOLAS chapter II-1 subdivision and damage stability regulations,

HAVING CONSIDERED, at its ninety-eighth session, the recommendations made by the Sub-Committee on Ship Design and Construction, at its fourth session,

1 ADOPTS the Revised Explanatory Notes to the SOLAS chapter II-1 subdivision and damage stability regulations set out in the annex to the present resolution;

2 URGES Contracting Governments and all parties concerned to utilize the Revised Explanatory Notes when applying the SOLAS chapter II-1 subdivision and damage stability regulations adopted by resolution MSC.216(82), as amended;

3 INVITES Contracting Governments to note that these Revised Explanatory Notes should take effect on ships as defined in SOLAS regulation II-1/1.1.1, as adopted by resolution MSC.421(98).

ANNEX

REVISED EXPLANATORY NOTES TO THE SOLAS CHAPTER II-1 SUBDIVISION AND DAMAGE STABILITY REGULATIONS

Contents

PART A

INTRODUCTION

1 The harmonized SOLAS regulations on subdivision and damage stability, as contained in SOLAS chapter II-1, are based on a probabilistic concept which uses the probability of survival after collision as a measure of ships' safety in a damaged condition. This probability is referred to as the "attained subdivision index *A*" in the regulations. It can be considered an objective measure of ships' safety and, ideally, there would be no need to supplement this index by any deterministic requirements.

2 The philosophy behind the probabilistic concept is that two different ships with the same attained index are of equal safety and, therefore, there is no need for special treatment of specific parts of the ship, even if they are able to survive different damages. The only areas which are given special attention in the regulations are the forward and bottom regions, which are dealt with by special subdivision rules provided for cases of ramming and grounding.

3 Only a few deterministic elements, which were necessary to make the concept practicable, have been included. It was also necessary to include a deterministic "minor damage" on top of the probabilistic regulations for passenger ships to avoid ships being designed with what might be perceived as unacceptably vulnerable spots in some part of their length.

4 It is easily recognized that there are many factors that will affect the final consequences of hull damage to a ship. These factors are random and their influence is different for ships with different characteristics. For example, it would seem obvious that in ships of similar size carrying different amounts of cargo, damages of similar extents may lead to different results because of differences in the range of permeability and draught during service. The mass and velocity of the ramming ship is obviously another random variable.

5 Owing to this, the effect of a three-dimensional damage to a ship with given watertight subdivision depends on the following circumstances:

.1 which particular space or group of adjacent spaces is flooded;

.2 the draught, trim and intact metacentric height at the time of damage;

.3 the permeability of affected spaces at the time of damage;

.4 the sea state at the time of damage; and

.5 other factors such as possible heeling moments owing to unsymmetrical weights.

6 Some of these circumstances are interdependent and the relationship between them and their effects may vary in different cases. Additionally, the effect of hull strength on penetration will obviously have some effect on the results for a given ship. Since the location and size of the damage is random, it is not possible to state which part of the ship becomes flooded. However, the probability of flooding a given space can be determined if the probability of occurrence of certain damages is known from experience, that is, damage statistics. The probability of flooding a space is then equal to the probability of occurrence of all such damages which just open the considered space to the sea.

7 For these reasons and because of mathematical complexity as well as insufficient data, it would not be practicable to make an exact or direct assessment of their effect on the probability that a particular ship will survive a random damage if it occurs. However, accepting some approximations or qualitative judgments, a logical treatment may be achieved by using the probability approach as the basis for a comparative method for the assessment and regulation of ship safety.

8 It may be demonstrated by means of probability theory that the probability of ship survival should be calculated as the sum of probabilities of its survival after flooding each single compartment, each group of two, three, etc., adjacent compartments multiplied, respectively, by the probabilities of occurrence of such damages leading to the flooding of the corresponding compartment or group of compartments.

9 If the probability of occurrence for each of the damage scenarios the ship could be subjected to is calculated and then combined with the probability of surviving each of these damages with the ship loaded in the most probable loading conditions, we can determine the attained index *A* as a measure for the ship's ability to sustain a collision damage.

10 It follows that the probability that a ship will remain afloat without sinking or capsizing as a result of an arbitrary collision in a given longitudinal position can be broken down to:

.1 the probability that the longitudinal centre of damage occurs in just the region of the ship under consideration;

.2 the probability that this damage has a longitudinal extent that only includes spaces between the transverse watertight bulkheads found in this region;

.3 the probability that the damage has a vertical extent that will flood only the spaces below a given horizontal boundary, such as a watertight deck;

.4 the probability that the damage has a transverse penetration not greater than the distance to a given longitudinal boundary; and

.5 the probability that the watertight integrity and the stability throughout the flooding sequence is sufficient to avoid capsizing or sinking.

11 The first three of these factors are solely dependent on the watertight arrangement of the ship, while the last two depend on the ship's shape. The last factor also depends on the actual loading condition. By grouping these probabilities, calculations of the probability of survival, or attained index *A*, have been formulated to include the following probabilities:

.1 the probability of flooding each single compartment and each possible group of two or more adjacent compartments; and

.2 the probability that the stability after flooding a compartment or a group of two or more adjacent compartments will be sufficient to prevent capsizing or dangerous heeling due to loss of stability or to heeling moments in intermediate or final stages of flooding.

12 This concept allows a rule requirement to be applied by requiring a minimum value of *A* for a particular ship. This minimum value is referred to as the "required subdivision index *R*" in the present regulations and can be made dependent on ship size, number of passengers or other factors legislators might consider important.

13 Evidence of compliance with the rules then simply becomes:

$$A \geq R$$

13.1 As explained above, the attained subdivision index *A* is determined by a formula for the entire probability as the sum of the products for each compartment or group of compartments of the probability that a space is flooded, multiplied by the probability that the ship will not capsize or sink due to flooding of the considered space. In other words, the general formula for the attained index can be given in the form:

$$A = \Sigma p_i s_i$$

13.2 Subscript "*i*" represents the damage zone (group of compartments) under consideration within the watertight subdivision of the ship. The subdivision is viewed in the longitudinal direction, starting with the aftmost zone/compartment.

13.3 The value of "p_i" represents the probability that only the zone "*i*" under consideration will be flooded, disregarding any horizontal subdivision, but taking transverse subdivision into account. Longitudinal subdivision within the zone will result in additional flooding scenarios, each with its own probability of occurrence.

13.4 The value of "s_i" represents the probability of survival after flooding the zone "*i*" under consideration.

14 Although the ideas outlined above are very simple, their practical application in an exact manner would give rise to several difficulties if a mathematically perfect method was to be developed. As pointed out above, an extensive but still incomplete description of the damage will include its longitudinal and vertical location as well as its longitudinal, vertical and transverse extent. Apart from the difficulties in handling such a five-dimensional random variable, it is impossible to determine its probability distribution very accurately with the presently available damage statistics. Similar limitations are true for the variables and physical relationships involved in the calculation of the probability that a ship will not capsize or sink during intermediate stages or in the final stage of flooding.

15 A close approximation of the available statistics would result in extremely numerous and complicated computations. In order to make the concept practicable, extensive simplifications are necessary. Although it is not possible to calculate the exact probability of survival on such a simplified basis, it has still been possible to develop a useful comparative measure of the merits of the longitudinal, transverse and horizontal subdivision of a ship.

PART B

GUIDANCE ON INDIVIDUAL SOLAS CHAPTER II-1 SUBDIVISION AND DAMAGE STABILITY REGULATIONS

REGULATION 1 – APPLICATION

Regulation 1.3

1 If a passenger ship built before 1 January 2009 undergoes alterations or modifications of major character, it may still remain under the damage stability regulations applicable to ships built before 1 January 2009.

2 If a passenger ship constructed on or after 1 January 2009 but before the applicable dates in regulation 1.1.1.1[*] undergoes alterations or modifications of major character that don't impact the watertight subdivision of the ship, or only have a minor impact, it may still remain under the damage stability regulations that were applicable when it was constructed. However, if alterations or modifications of major character significantly impact the watertight subdivision of the ship, it should comply with the damage stability regulations in part B-1 applicable when the alterations or modifications of major character are carried out unless the Administration determines that this is not reasonable and practicable, in which case the attained subdivision index *A* should be raised above the original construction required subdivision index *R* as much as practical.

3 Application of MSC.1/Circ.1246 is limited to cargo ships constructed before 1 January 2009.

4 A cargo ship constructed on or after 1 January 2009 of less than 80 m in length that is later lengthened beyond that limit should fully comply with the damage stability regulations according to its type and length.

5 If a passenger ship that has been in domestic service only and never issued a SOLAS Passenger Ship Safety Certificate is converted to international service, for purposes of the stability requirements in parts B, B-1, B-2, B-3 and B-4 it should be treated as a passenger ship constructed on the date on which such a conversion commences.

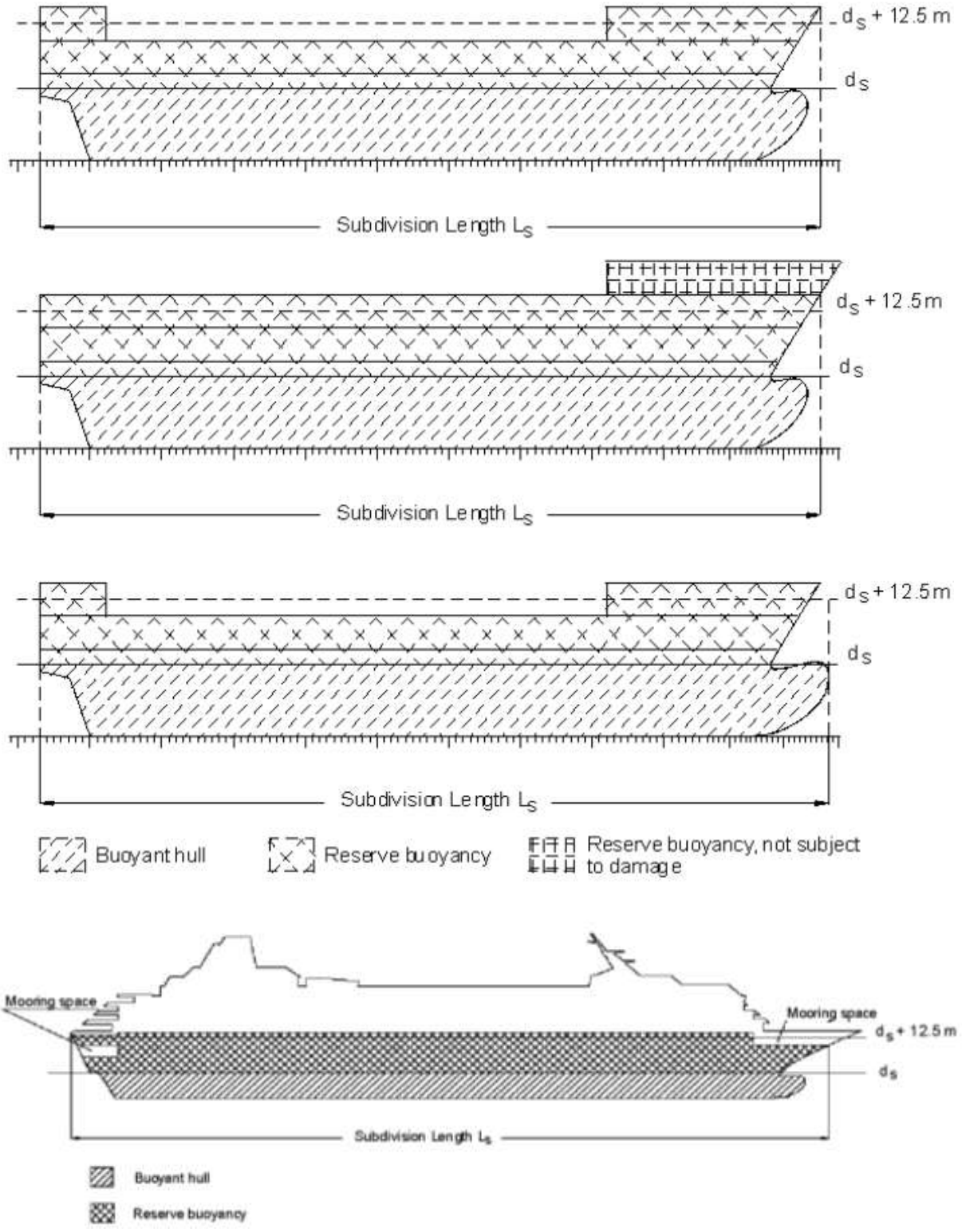
REGULATION 2 – DEFINITIONS

Regulation 2.1

Subdivision length (L_s) – Different examples of L_s showing the buoyant hull and the reserve buoyancy are provided in the figures below. The limiting deck for the reserve buoyancy may be partially watertight.

The maximum possible vertical extent of damage above the baseline is d_s + 12.5 metres.

[*] References to regulations in this Guidance are to regulations of SOLAS chapter II-1, unless expressly provided otherwise.



Regulation 2.6

Freeboard deck – See explanatory notes for regulation 13-1 for the treatment of a stepped freeboard deck with regard to watertightness and construction requirements.

Regulation 2.11

Light service draught (d_l) – The light service draught (d_l) corresponds, in general, to the ballast arrival condition with 10% consumables for cargo ships. For passenger ships it corresponds, in general, to the arrival condition with 10% consumables, a full complement of passengers and crew and their effects, and ballast as necessary for stability and trim. Any temporary ballast water exchange conditions for compliance with the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 or any non-service conditions, such as dry-docking, should not be taken as d_l.

Regulation 2.19

Bulkhead deck – See explanatory notes for regulation 13 for the treatment of a stepped bulkhead deck with regard to watertightness and construction requirements.

REGULATION 4 – GENERAL

Regulation 4.5

See explanatory notes for regulation 7-2.2, for information and guidance related to these provisions.

REGULATION 5 – INTACT STABILITY

Regulation 5.2

1 For the purpose of this regulation, a sister ship means a cargo ship built by the same shipyard from the same plans.

2 For any new sister ship with known differences from the lead sister ship that do not exceed the lightship displacement and longitudinal centre of gravity deviation limits specified in regulation 5.2, a detailed weights and centres of gravity calculation to adjust the lead sister ship's lightship properties should be carried out. These adjusted lead sister ship lightship properties are then used for comparison to the new sister ship's lightweight survey results. However, in cases when the known differences from the lead sister ship exceed lightship displacement or longitudinal centre of gravity deviation limits specified in regulation 5.2, the ship should be inclined.

3 When the lightweight survey results do not exceed the specified deviation limits, the lightship displacement and the longitudinal and transverse centres of gravity obtained from the lightweight survey should be used in conjunction with the higher of either the lead sister ship's vertical centre of gravity or the calculated, adjusted value.

4 Regulation 5.2 may be applied to the SPS Code ships certified to carry less than 240 persons.

Regulation 5.4

1 When alterations are made to a ship in service that result in calculable differences in the lightship properties, a detailed weights and centres of gravity calculation to adjust the lightship properties should be carried out. If the adjusted lightship displacement or longitudinal centre of gravity, when compared to the approved values, exceeds one of the deviation limits specified in regulation 5.5, the ship should be re-inclined. In addition, if the adjusted lightship vertical centre of gravity, when compared to the approved value, exceeds 1%, the ship should be re-inclined. The lightship transverse centre of gravity is not subject to a deviation limit.

2 When a ship does not exceed the deviation limits specified in explanatory note 1 above, amended stability information should be provided to the master using the new calculated lightship properties if any of the following deviations from the approved values are exceeded:

.1 1% of the lightship displacement; or

.2 0.5% of L for the longitudinal centre of gravity; or

.3 0.5% of the vertical centre of gravity.

However, in cases when these deviation limits are not exceeded, it is not necessary to amend the stability information supplied to the master.

3 When multiple alterations are made to a ship in service over a period of time and each alternation is within the deviation limits specified above, the cumulative total changes to the lightship properties from the most recent inclining also should not exceed the deviation limits specified above or the ship should be re-inclined.

Regulation 5.5

When the lightweight survey results do not exceed the specified deviation limits, the lightship displacement and the longitudinal and transverse centres of gravity obtained from the lightweight survey should be used in conjunction with the vertical centre of gravity derived from the most recent inclining in all subsequent stability information supplied to the master.

REGULATION 5-1 – STABILITY INFORMATION TO BE SUPPLIED TO THE MASTER

Regulation 5-1.3

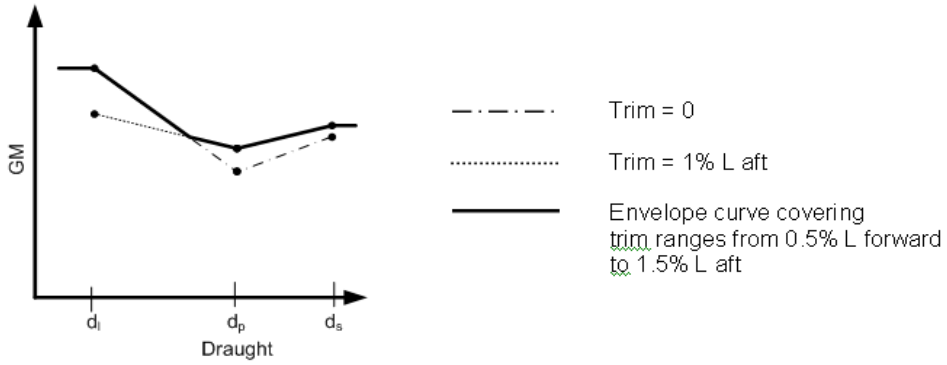
The requirement that applied trim values shall coincide in all stability information intended for use on board, is intended to address initial stability calculations as well as those that may be necessary during the service life of the ship.

Regulation 5-1.4 (see also regulation 7.2)

1 Linear interpolation of the limiting values between the draughts d_s, d_p and d_l is only applicable to minimum *GM* values. If it is intended to develop curves of maximum permissible *KG*, a sufficient number of KM_T values for intermediate draughts should be calculated to ensure that the resulting maximum *KG* curves correspond with a linear variation of *GM*. When light service draught is not with the same trim as other draughts, KM_T for draughts between partial and light service draught should be calculated for trims interpolated between trim at partial draught and trim at light service draught.

2 In cases where the operational trim range is intended to exceed ±0.5% of *L*, the original *GM* limit line should be designed in the usual manner with the deepest subdivision draught and partial subdivision draught calculated at level trim and estimated service trim used for the light service draught. Then additional sets of *GM* limit lines should be constructed on the basis of the operational range of trims which is covered by loading conditions for each of the three draughts d_s, d_p and d_l ensuring that intervals of 1% *L* are not exceeded. The sets of *GM* limit lines are combined to give a single envelope limiting *GM* curve. The effective trim range of the curve should be clearly stated.

3 If multiple *GM* limiting curves are obtained from damage stability calculations of differing trims in accordance with regulation 7, an envelope curve covering all calculated trim values should be developed. Calculations covering different trim values should be carried out in steps not exceeding 1% of *L*. The whole range including intermediate trims should be covered by the damage stability calculations. Refer to the example showing an envelope curve obtained from calculations of 0 trim and 1% of *L*.

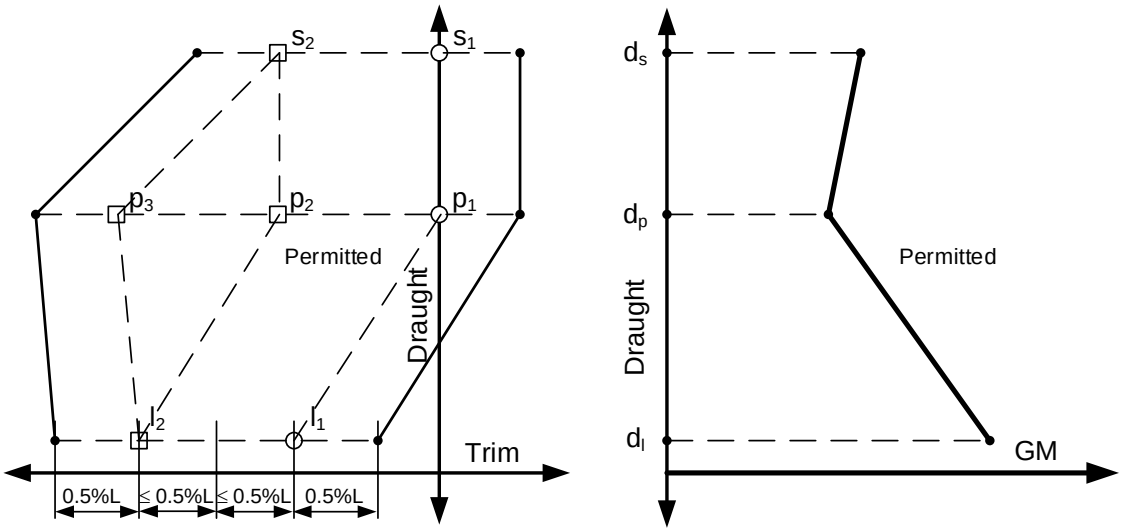


4 Temporary loading conditions may occur with a draught less than the light service draught d_l due to ballast water exchange requirements, etc. In these cases, for draughts below d_l, the *GM* limit value at d_l is to be used.

5 Ships may be permitted to sail at draughts above the deepest subdivision draught d_s according to the International Convention on Load Lines, e.g. using the tropical freeboard. In these cases, for draughts above d_s the *GM* limit value at d_s is to be used.

Regulation 5-1.5

There could be cases where it is desirable to expand the trim range, for instance around d_p. This approach is based on the principle that it is not necessary that the same number of trims be used when the *GM* is the same throughout a draught and when the steps between trims do not exceed 1% of *L*. In these cases there will be three *A* values based on draughts s_1, p_1, l_1 and s_2, p_2, l_2 and s_2, p_3, l_2. The lowest value of each partial index A_s, A_p and A_l across these trims should be used in the summation of the attained subdivision index *A*.



Trim limit diagram **GM limit curve**

Regulation 5-1.6

This provision is intended to address cases where an Administration approves an alternative means of verification.

REGULATION 6 – REQUIRED SUBDIVISION INDEX *R*

Regulation 6.1

To demonstrate compliance with these provisions, see the Guidelines for the preparation of subdivision and damage stability calculations, set out in the appendix, regarding the presentation of damage stability calculation results.

REGULATION 7 – ATTAINED SUBDIVISION INDEX *A*

Regulation 7.1

1 The probability of surviving after collision damage to the ship's hull is expressed by the index *A*. Producing an index *A* requires calculation of various damage scenarios defined by the extent of damage and the initial loading conditions of the ship before damage. Three loading conditions should be considered and the result weighted as follows:

$$A = 0.4A_s + 0.4A_p + 0.2A_l$$

where the indices *s*, *p* and *l* represent the three loading conditions and the factor to be multiplied to the index indicates how the index *A* from each loading condition is weighted.

2 The method of calculating *A* for a loading condition is expressed by the formula:

$$A_c = \sum_{i=1}^{i=t} p_i \left[v_i s_i \right]$$

2.1 The index *c* represents one of the three loading conditions, the index *i* represents each investigated damage or group of damages and *t* is the number of damages to be investigated to calculate A_c for the particular loading condition.

2.2 To obtain a maximum index *A* for a given subdivision, *t* has to be equal to *T*, the total number of damages.

3 In practice, the damage combinations to be considered are limited either by significantly reduced contributions to *A* (i.e. flooding of substantially larger volumes) or by exceeding the maximum possible damage length.

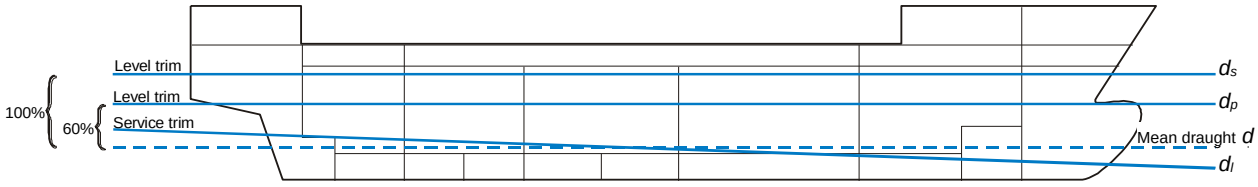
4 The index *A* is divided into partial factors as follows:

p_i The *p* factor is solely dependent on the geometry of the watertight arrangement of the ship.

v_i The *v* factor is dependent on the geometry of the watertight arrangement (decks) of the ship and the draught of the initial loading condition. It represents the probability that the spaces above the horizontal subdivision will not be flooded.

s_i The *s* factor is dependent on the calculated survivability of the ship after the considered damage for a specific initial condition.

5 Three initial loading conditions should be used for calculating each index *A.* The loading conditions are defined by their mean draught *d,* trim and *GM (*or *KG).* The mean draught and trim are illustrated in the figure below.



6 The *GM* (or *KG*) values for the three loading conditions could, as a first attempt, be taken from the intact stability *GM* (or *KG*) limit curve. If the required index *R* is not obtained, the *GM* (or *KG*) values may be increased (or reduced), implying that the intact loading conditions from the intact stability book must now meet the *GM* (or *KG*) limit curve from the damage stability calculations derived by linear interpolation between the three *GM*s.

7 For a series of new passenger or cargo ships built from the same plans each of which have the same draughts d_s, d_p and d_l as well as the same *GM* and trim limits, the attained subdivision index *A* calculated for the lead ship may be used for the other ships. In addition, small differences in the draught d_l (and the subsequent change in the draught d_p) are acceptable if they are due to small differences in the lightship characteristics that do not exceed the deviation limits specified in regulation 5.2. For cases where these conditions are not met, a new attained subdivision index *A* should be calculated.

"Built from the same plans" means that the watertight and weathertight aspects of the hull, bulkheads, openings and other parts of a ship that impact the attained subdivision index *A* calculation remain exactly the same.

8 For a passenger or cargo ship in service which undergoes alterations that materially affect the stability information supplied to the master and require it to be re-inclined in accordance with regulation 5.4, a new attained subdivision index *A* should be calculated. However, for alteration cases where a re-inclining is not required and the alterations do not change the watertight and weathertight arrangements of the ship that impact the attained subdivision index *A*, if d_s and the *GM* and trim limits remain the same then a new attained subdivision index *A* is not required.

9 For passenger ships subject to lightweight surveys every 5 years, if the lightweight survey results are within the limits specified in regulation 5.5, and d_s and the *GM* and trim limits remain the same, a new attained subdivision index *A* is not required. However, if the lightweight survey results exceed either limit specified in regulation 5.5, a new attained subdivision index *A* should be calculated.

10 For any new passenger or cargo ship for which the deviation in lightship characteristics between the preliminary and the as built values are within the limits specified in regulation 5.2 and d_s is unchanged, then the preliminary attained subdivision index *A* calculation may be approved as the final attained subdivision index *A* calculation. However, for cases where these conditions are not met, then a new attained subdivision index *A* should be calculated.

Regulation 7.2

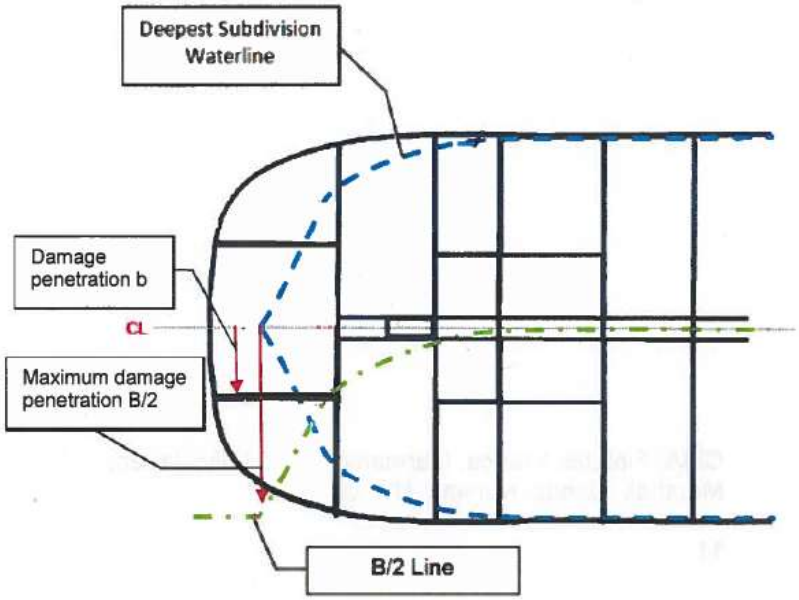
When additional calculations of *A* are performed for different trims, for a given set of calculations the difference between trim values for d_s, d_p and d_l may not exceed 1% *L*.

Regulation 7.5

1 With the same intent as wing tanks, the summation of the attained index *A* should reflect effects caused by all watertight bulkheads and flooding boundaries within the damaged zone. It is not correct to assume damage only to one half of the ship's breadth *B* and ignore changes in subdivision that would reflect lesser contributions.

2 In the forward and aft ends of the ship where the sectional breadth is less than the ship's breadth *B*, transverse damage penetration can extend beyond the centreline bulkhead. This application of the transverse extent of damage is consistent with the methodology to account for the localized statistics which are normalized on the greatest moulded breadth *B* rather than the local breadth.

3 Where, at the extreme ends of the ship, the subdivision exceeds the waterline at the deepest subdivision draught, the damage penetration *b* or *B*/2 is to be taken from centre line. The figure below illustrates the shape of the *B*/2 line.



4 Where longitudinal corrugated bulkheads are fitted in wing compartments or on the centreline, they may be treated as equivalent plane bulkheads provided the corrugation depth is of the same order as the stiffening structure. The same principle may also be applied to transverse corrugated bulkheads.

Regulation 7.6

Refer to the explanatory notes for regulation 7-2.2 for the treatment of free surfaces during all stages of flooding.

Regulation 7.7

1 Pipes and valves directly adjacent or situated as close as practicable to a bulkhead or to a deck can be considered to be part of the bulkhead or deck, provided the separation distance on either side of the bulkhead or deck is of the same order as the bulkhead or deck stiffening structure. The same applies for small recesses, drain wells, etc.

2 For ships up to L = 150 m the provision for allowing "minor progressive flooding" should be limited to pipes penetrating a watertight subdivision with a total cross-sectional area of not more than 710 mm^2 between any two watertight compartments. For ships of L = 150 m and upwards the total cross-sectional area of pipes should not exceed the cross-sectional area of one pipe with a diameter of L/5000 m.

REGULATION 7-1 – CALCULATION OF THE FACTOR p_i

General

1 The definitions below are intended to be used for the application of part B-1 only.

2 In regulation 7-1, the words "compartment" and "group of compartments" should be understood to mean "zone" and "adjacent zones".

3 Zone – a longitudinal interval of the ship within the subdivision length.

4 Room – a part of the ship, limited by bulkheads and decks, having a specific permeability.

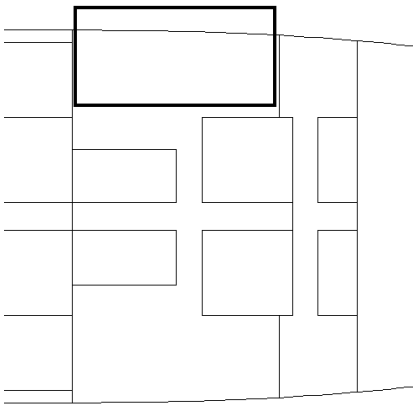
5 Space – a combination of rooms.

6 Compartment – a space within watertight boundaries.

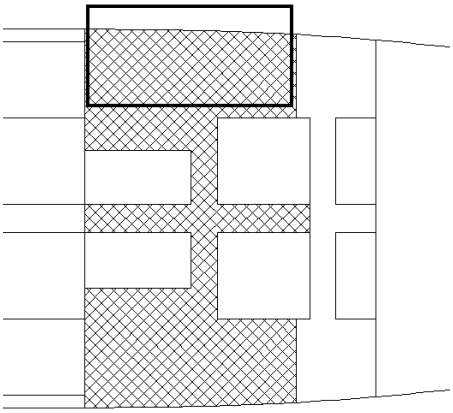
7 Damage – the three dimensional extent of the breach in the ship.

8 For the calculation of *p*, *v*, *r* and *b* only the damage should be considered, for the calculation of the *s*-value the flooded space should be considered. The figures below illustrate the difference.

Damage shown as the bold square:



Flooded space shown below:



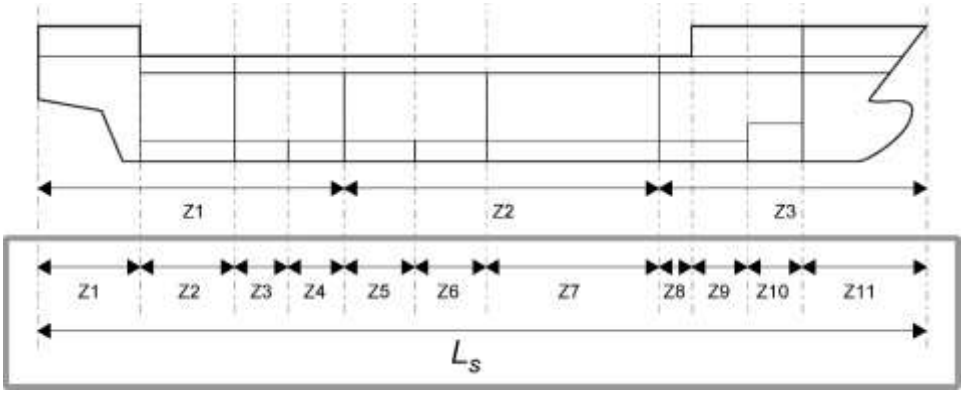
Regulation 7-1.1.1

1 The coefficients b_{11}, b_{12}, b_{21} and b_{22} are coefficients in the bi-linear probability density function on normalized damage length (*J*). The coefficient b_{12} is dependent on whether L_s is greater or less than L^* (i.e. 260 m); the other coefficients are valid irrespective of L_s.

Longitudinal subdivision

2 In order to prepare for the calculation of index *A*, the ship's subdivision length L_s is divided into a fixed discrete number of damage zones. These damage zones will determine the damage stability investigation in the way of specific damages to be calculated.

3 There are no specific rules for longitudinally subdividing the ship, except that the length L_s defines the extremities of the zones. Zone boundaries need not coincide with physical watertight boundaries. However, it is important to consider a strategy carefully to obtain a good result (that is a large attained index *A*). All zones and combination of adjacent zones may contribute to the index *A*. In general it is expected that the more zone boundaries the ship is divided into the higher will be the attained index, but this benefit should be balanced against extra computing time. The figure below shows different longitudinal zone divisions of the length L_s.



4 The first example is a very rough division into three zones of approximately the same size with limits where longitudinal subdivision is established. The probability that the ship will survive a damage in one of the three zones is expected to be low (i.e. the *s*-factor is low or zero) and, therefore, the total attained index *A* will be correspondingly low.

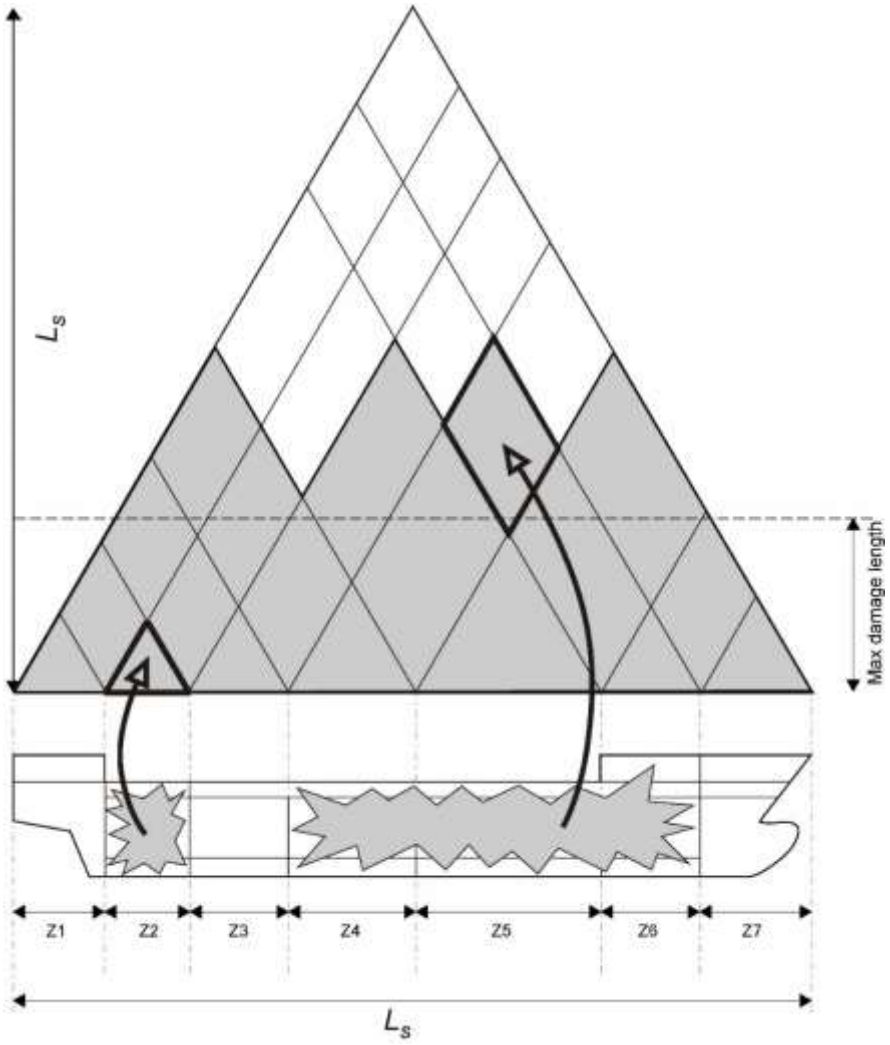
5 In the second example the zones have been placed in accordance with the watertight arrangement, including minor subdivision (as in double bottom, etc.). In this case there is a much better chance of obtaining higher *s*-factors.

6 Where transverse corrugated bulkheads are fitted, they may be treated as equivalent plane bulkheads, provided the corrugation depth is of the same order as the stiffening structure.

7 Pipes and valves directly adjacent or situated as close as practicable to a transverse bulkhead can be considered to be part of the bulkhead, provided the separation distance on either side of the bulkhead is of the same order as the bulkhead stiffening structure. The same applies for small recesses, drain wells, etc.

8 For cases where the pipes and valves cannot be considered as being part of the transverse bulkhead, when they present a risk of progressive flooding to other watertight compartments that will have influence on the overall attained index *A*, they should be handled either by introducing a new damage zone and accounting for the progressive flooding to associated compartments or by introducing a gap.

9 The triangle in the figure below illustrates the possible single and multiple zone damages in a ship with a watertight arrangement suitable for a seven-zone division. The triangles at the bottom line indicate single zone damages and the parallelograms indicate adjacent zones damages.



10 As an example, the triangle illustrates a damage opening the rooms in zone 2 to the sea and the parallelogram illustrates a damage where rooms in the zones 4, 5 and 6 are flooded simultaneously.

11 The shaded area illustrates the effect of the maximum absolute damage length. The *p*-factor for a combination of three or more adjacent zones equals zero if the length of the combined adjacent damage zones minus the length of the foremost and the aft most damage zones in the combined damage zone is greater than the maximum damage length. Having this in mind when subdividing L_s could limit the number of zones defined to maximize the attained index *A*.

12 As the *p*-factor is related to the watertight arrangement by the longitudinal limits of damage zones and the transverse distance from the ship side to any longitudinal barrier in the zone, the following indices are introduced:

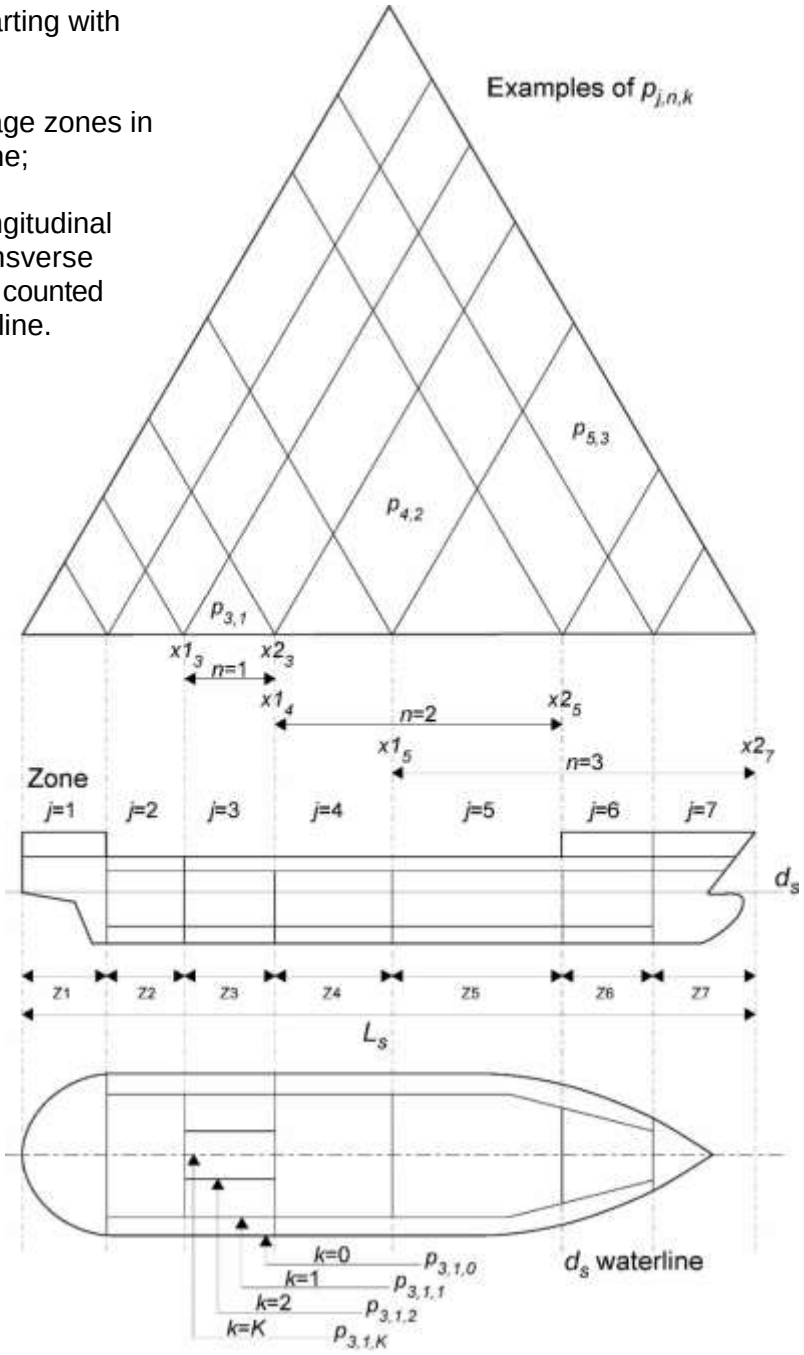
j: the damage zone number starting with No.1 at the stern;

n: the number of adjacent damage zones in question where *j* is the aft zone;

k: the number of a particular longitudinal bulkhead as a barrier for transverse penetration in a damage zone counted from shell towards the centreline. The shell has No. 0;

K: total number of transverse penetration boundaries;

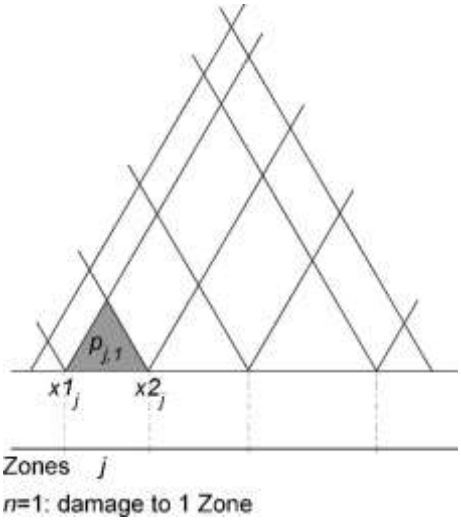
$p_{j,n,k}$: the *p*-factor for a damage in zone *j* and next (*n*-1) zones forward of *j* damaged to the longitudinal bulkhead *k*.



Pure longitudinal subdivision

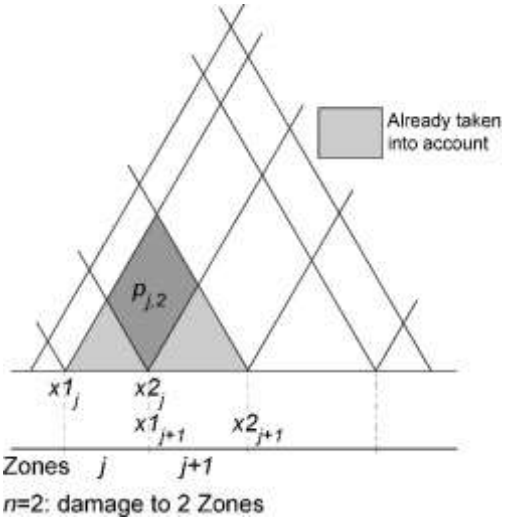
Single damage zone, pure longitudinal subdivision:

$p_{j,1} = p(x1_j, x2_j)$



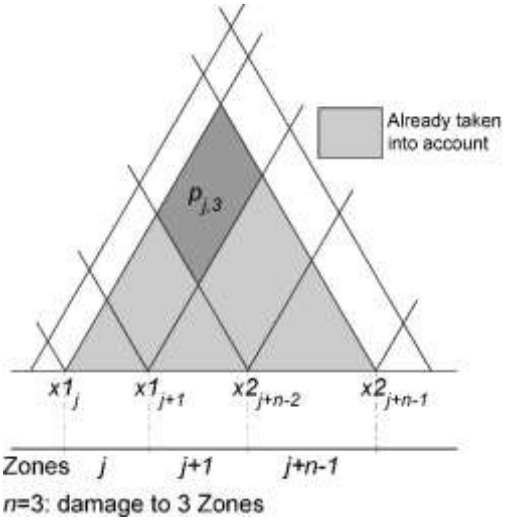
Two adjacent zones, pure longitudinal subdivision:

$p_{j,2} = p(x1_j, x2_{j+1}) - p(x1_j, x2_j) - p(x1_{j+1}, x2_{j+1})$



Three or more adjacent zones, pure longitudinal subdivision:

$p_{j,n} = p(x1_j, x2_{j+n-1}) - p(x1_j, x2_{j+n-2}) - p(x1_{j+1}, x2_{j+n-1}) + p(x1_{j+1}, x2_{j+n-2})$



Regulation 7-1.1.2

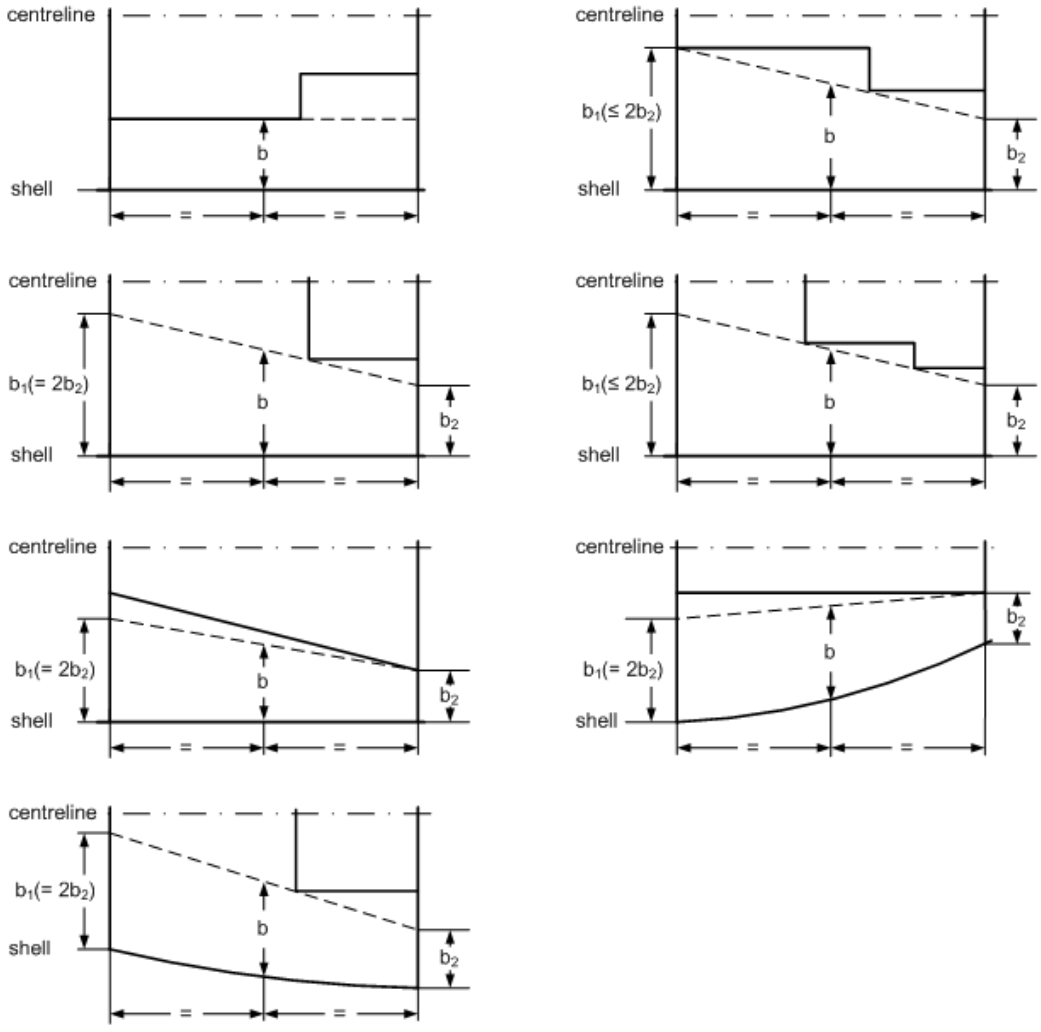
Transverse subdivision in a damage zone

1 Damage to the hull in a specific damage zone may just penetrate the ship's watertight hull or penetrate further towards the centreline. To describe the probability of penetrating only a wing compartment, a probability factor *r* is used, based mainly on the penetration depth *b*. The value of *r* is equal to 1, if the penetration depth is *B/2* where *B* is the maximum breadth of the ship at the deepest subdivision draught d_s, and *r* = 0 if *b* = 0.

2 The penetration depth *b* is measured at level deepest subdivision draught d_s as a transverse distance from the ship side right-angled to the centreline to a longitudinal barrier.

3 Where the actual watertight bulkhead is not a plane parallel to the shell, *b* should be determined by means of an assumed line, dividing the zone to the shell in a relationship b_1/b_2 with $1/2 \leq b_1/b_2 \leq 2$.

4 Examples of such assumed division lines are illustrated in the figure below. Each sketch represents a single damage zone at a water line plane level d_s and the longitudinal bulkhead represents the outermost bulkhead position below d_s + 12.5 m.



4.1 If a transverse subdivision intercepts the deepest subdivision draught waterline within the extent of the zone, *b* is equal to zero in that zone for that transverse subdivision, see figure 1. A non-zero *b* can be obtained by including an additional zone, see figure 2.

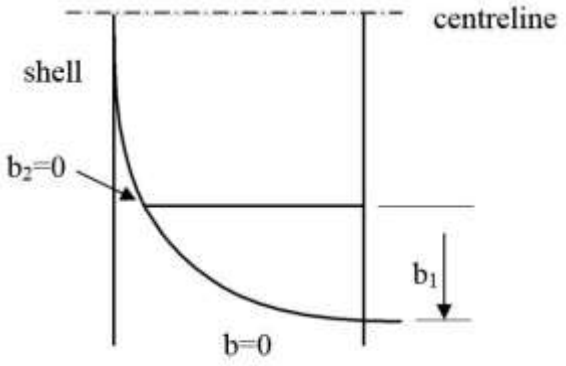


Figure 1

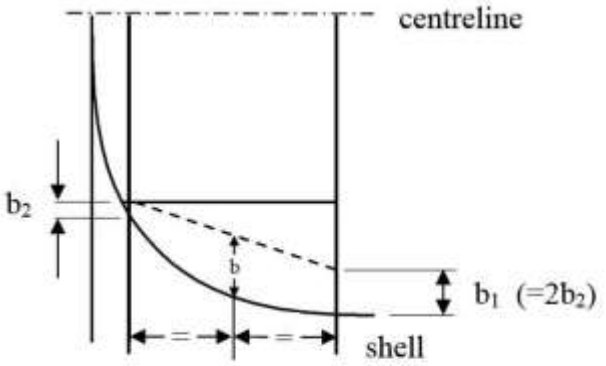


Figure 2

4.2 If the deepest subdivision draught waterline on the side of a single hull ship includes a part where multiple transverse (y) coordinates occur for a longitudinal (x) location, a straightened reference waterline can be used for the calculation of *b*. If this approach is chosen, the original waterline is replaced by an envelope curve including straight parts perpendicular to the centreline where multiple transverse coordinates occur, see figures 1 to 4. The maximum transverse damage extent *B/2* should then be calculated from waterline or the reference waterline, if applicable, at the deepest subdivision draught.

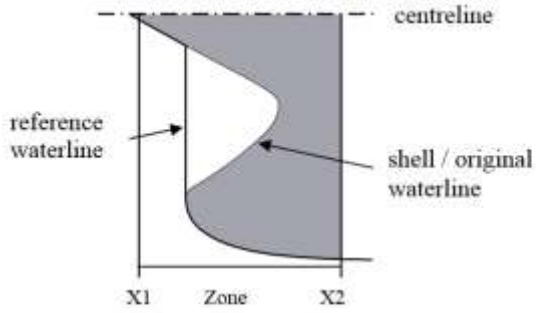


Figure 1

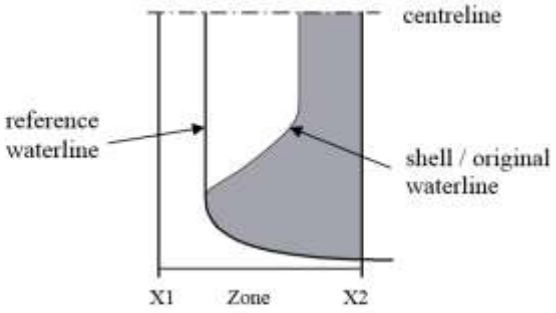


Figure 2

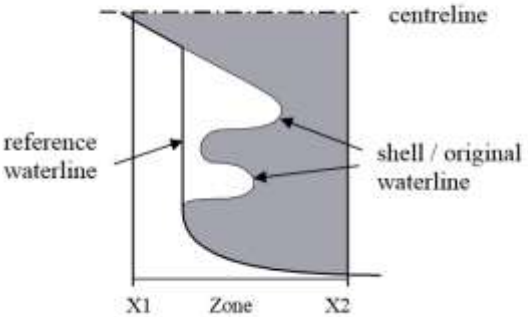


Figure 3

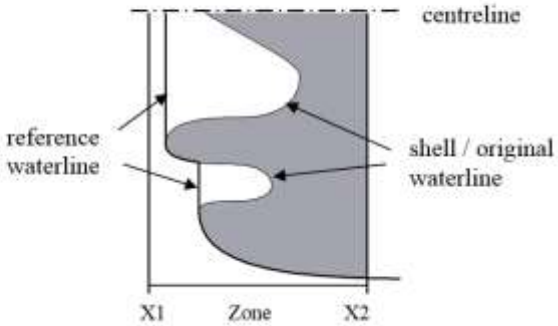


Figure 4

5 In calculating *r*-values for a group of two or more adjacent compartments, the *b*-value is common for all compartments in that group, and equal to the smallest *b*-value in that group:

$$b = \min\{b_1, b_2, \ldots, b_n\}$$

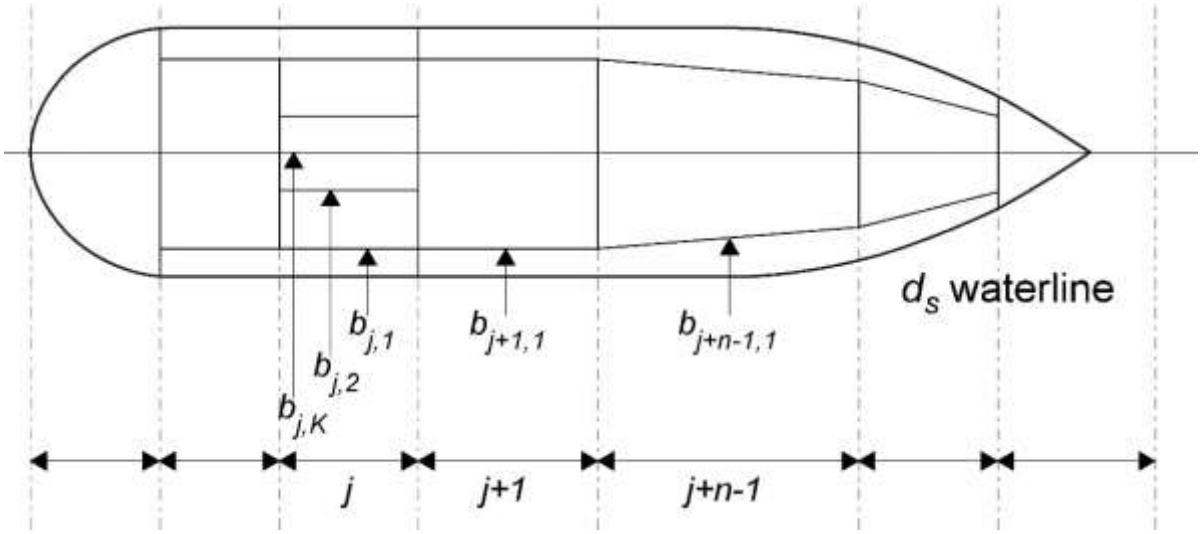
where: $n =$ number of wing compartments in that group;
$b_1, b_2, \ldots, b_n =$ mean values of *b* for individual wing compartments contained in the group.

Accumulating p

6 The accumulated value of *p* for one zone or a group of adjacent zones is determined by:

$$p_{j,n} = \sum_{k=1}^{k=K_{j,n}} p_{j,n,k}$$

where $K_{j,n} = \sum_{j}^{j+n-1} K_j$ the total number of b_k's for the adjacent zones in question.



7 The figure above illustrates *b*'s for adjacent zones. The zone *j* has two penetration limits and one to the centre, the zone *j+1* has one *b* and the zone *j+n-1* has one value for *b*. The multiple zones will have (2+1+1) four values of *b*, and sorted in increasing order they are:

$(b_{j,1}\,;\, b_{j+1,1}\,;\, b_{j+n-1,1}\,;\, b_{j,2}\,;\, b_K)$

8 Because of the expression for *r(x1, x2, b)* only one b_K should be considered. To minimize the number of calculations, *b*'s of the same value may be deleted.

As $b_{j,1} = b_{j+1,1}$ the final *b*'s will be $(b_{j,1}\,;\, b_{j+n-1,1}\,;\, b_{j,2}\,;\, b_K)$

Examples of multiple zones having a different b

9 Examples of combined damage zones and damage definitions are given in the figures below. Compartments are identified by R10, R12, etc.

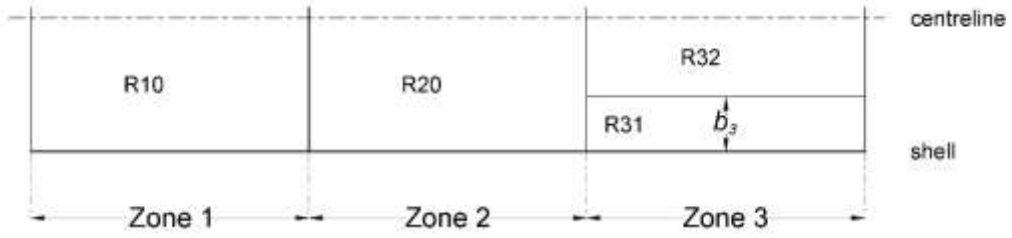


Figure: Combined damage of zones 1 + 2 + 3 includes a limited penetration to b_3, taken into account generating two damages:

1) to b_3 with R10, R20 and R31 damaged;
2) to *B/2* with R10, R20, R31 and R32 damaged.

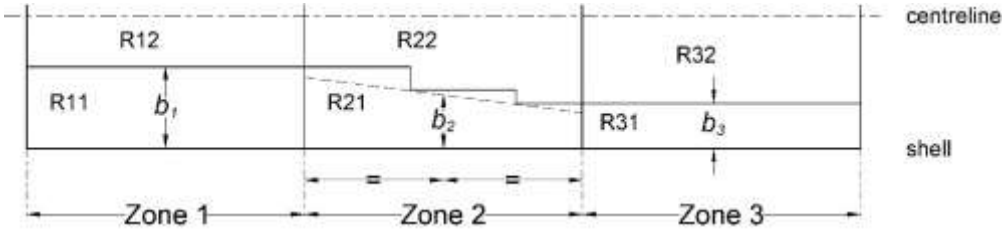


Figure: Combined damage of zones 1 + 2 + 3 includes 3 different limited damage penetrations generating four damages:

1) to b_3 with R11, R21 and R31 damaged;
2) to b_2 with R11, R21, R31 and R32 damaged;
3) to b_1 with R11, R21, R31, R32, and R22 damaged;
4) to *B/2* with R11, R21, R31, R32, R22 and R12 damaged.

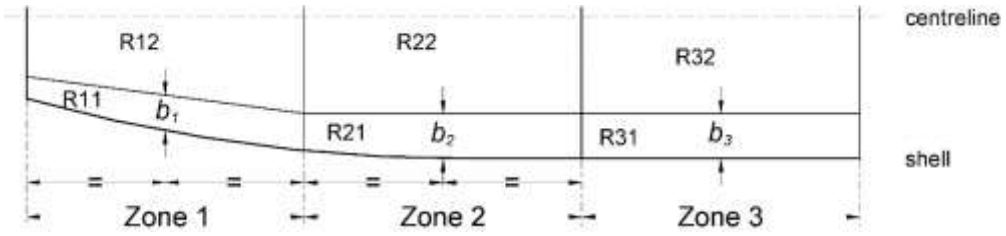
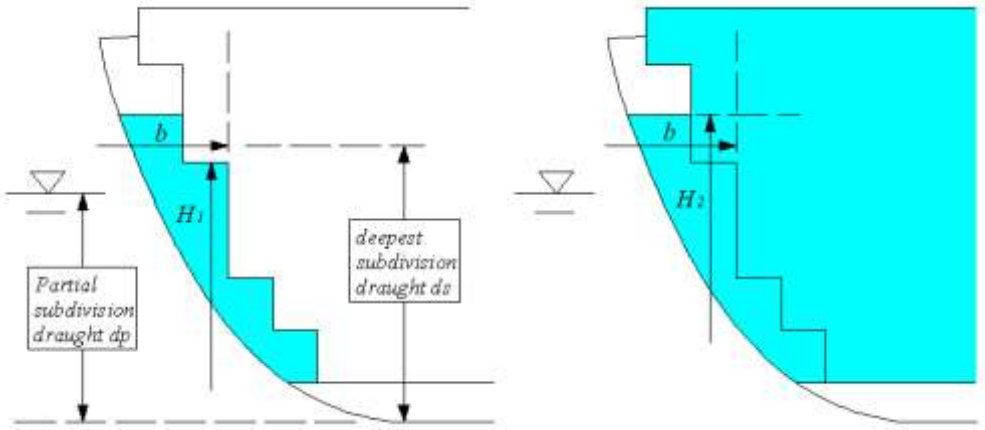


Figure: Combined damage of zone 1 + 2 + 3 including 2 different limited damage penetrations ($b_1 < b_2 = b_3$) generating three damages:

1) to b_1 with R11, R21 and R31 damaged;
2) to b_2 with R11, R21, R31 and R12 damaged;
3) to *B/2* with R11, R21, R31, R12, R22 and R32 damaged.

10 A damage having a transverse extent *b* and a vertical extent H_2 leads to the flooding of both wing compartment and hold; for *b* and H_1 only the wing compartment is flooded. The figure below illustrates a partial subdivision draught d_p damage.



11 The same is valid if *b*-values are calculated for arrangements with sloped walls.

12 Pipes and valves directly adjacent or situated as close as practicable to a longitudinal bulkhead can be considered to be part of the bulkhead, provided the separation distance on either side of the bulkhead is of the same order as the bulkhead stiffening structure. The same applies for small recesses, drain wells, etc.

REGULATION 7-2 – CALCULATION OF THE FACTOR s_i

General

1 Initial condition – an intact loading condition to be considered in the damage analysis described by the mean draught, vertical centre of gravity and the trim; or alternative parameters from where the same may be determined (e.g. displacement, *GM* and trim). There are three initial conditions corresponding to the three draughts d_s, d_p and d_l.

2 Immersion limits – immersion limits are an array of points that are not to be immersed at various stages of flooding as indicated in regulations 7-2.5.2 and 7-2.5.3.

3 Openings – all openings need to be defined: both weathertight and unprotected. Openings are the most critical factor to preventing an inaccurate index *A*. If the final waterline immerses the lower edge of any opening through which progressive flooding takes place, the factor "*s*" may be recalculated taking such flooding into account. However, in this case the *s* value should also be calculated without taking into account progressive flooding and corresponding opening. The smallest *s* value should be retained for the contribution to the attained index.

Regulation 7-2.1

1 In cases where the *GZ* curve may include more than one "range" of positive righting levers for a specific stage of flooding, only one continuous positive "range" of the *GZ* curve may be used within the allowable range/heel limits for calculation purposes. Different stages of flooding may not be combined in a single *GZ* curve.

Figure 1

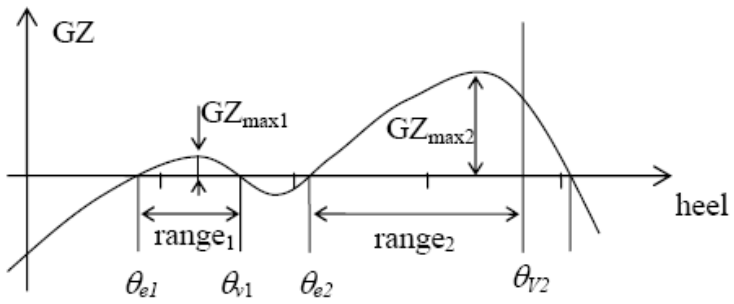
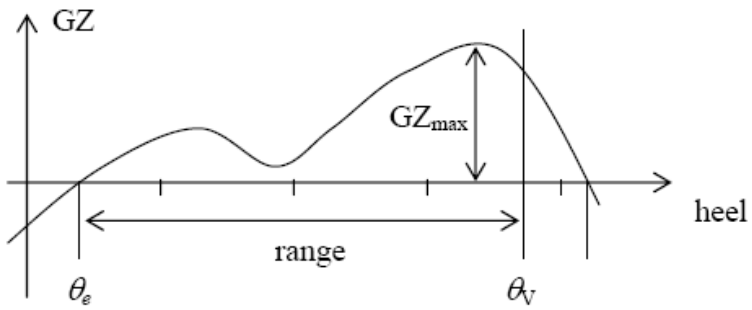


Figure 2



2 In figure 1, the *s*-factor may be calculated from the heel angle, range and corresponding GZ_{max} of the first or second "range" of positive righting levers. In figure 2, only one *s*-factor can be calculated.

Regulation 7-2.2

Intermediate stages of flooding

1 The case of instantaneous flooding in unrestricted spaces in way of the damage zone does not require intermediate stage flooding calculations. Where intermediate stages of flooding calculations are necessary in connection with progressive flooding, flooding through non-watertight boundaries or cross-flooding, they should reflect the sequence of filling as well as filling level phases. Calculations for intermediate stages of flooding should be performed whenever equalization is not instantaneous, i.e. equalization is of a duration greater than 60 s. Such calculations consider the progress through one or more floodable (non-watertight) spaces, or cross-flooded spaces. Bulkheads surrounding refrigerated spaces, incinerator rooms and longitudinal bulkheads fitted with non-watertight doors are typical examples of structures that may significantly slow down the equalization of main compartments.

Flooding boundaries

2 If a compartment contains decks, inner bulkheads, structural elements and doors of sufficient tightness and strength to seriously restrict the flow of water, for intermediate stage flooding calculation purposes it should be divided into corresponding non-watertight spaces. It is assumed that the non-watertight divisions considered in the calculations are limited to "A" class fire-rated bulkheads and decks, and do not apply to "B" class fire-rated bulkheads normally used in accommodation areas (e.g. cabins and corridors). This guidance also relates to regulation 4.5. For spaces in the double bottom, in general, only main longitudinal structures with a limited number of openings have to be considered as flooding boundaries.

Sequential flooding computation

3 For each damage scenario, the damage extent and location determine the initial stage of flooding. Calculations should be performed in stages, each stage comprising of at least two intermediate filling phases in addition to the full phase per flooded space. Unrestricted spaces in way of damage should be considered as flooded immediately. Every subsequent stage involves all connected spaces being flooded simultaneously until an impermeable boundary or final equilibrium is reached. Unless the flooding process is simulated using time-domain methods, when a flooding stage leads to both a self-acting cross-flooding device and a non-watertight boundary, the self-acting cross-flooding device is assumed to act immediately and occur before the non-watertight boundary is breached. If due to the configuration of the subdivision in the ship it is expected that other intermediate stages of flooding are more onerous, then those should be investigated.

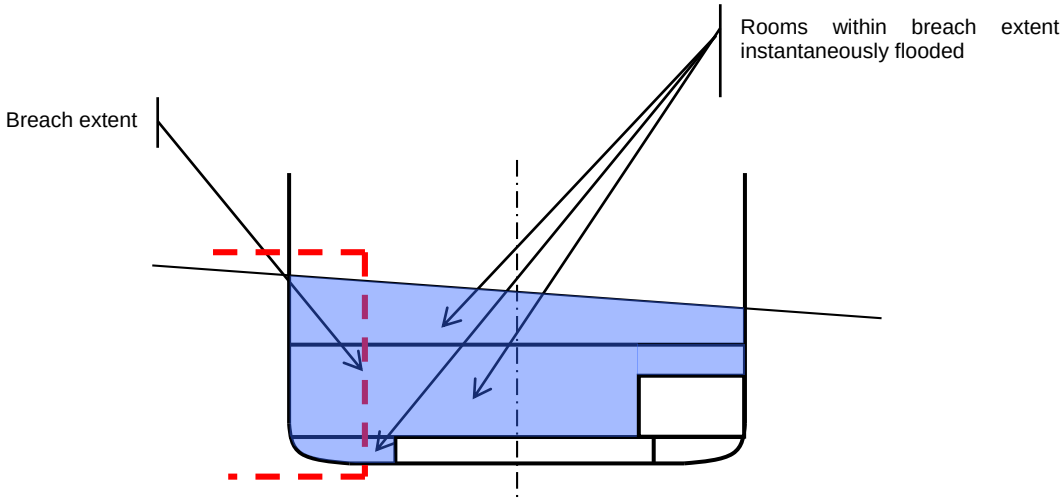
3.1 For each phase of a flooding stage (except the final full phase), the instantaneous transverse moment of this floodwater is calculated by assuming a constant volume of water at each heeling angle. The *GZ* curve is calculated with a constant intact displacement at all stages of flooding. Only one free surface needs to be assumed for water in spaces flooded during the current stage.

In the final full phase of each stage, the water level in rooms flooded during this stage reaches the outside sea level, so the lost buoyancy method can be used. The same method applies for every successive stage (added volume of water with a constant intact displacement for all phases before the final full phase of the stage in consideration), while each of the previous stages at the final full phase can be calculated with the lost buoyancy method.

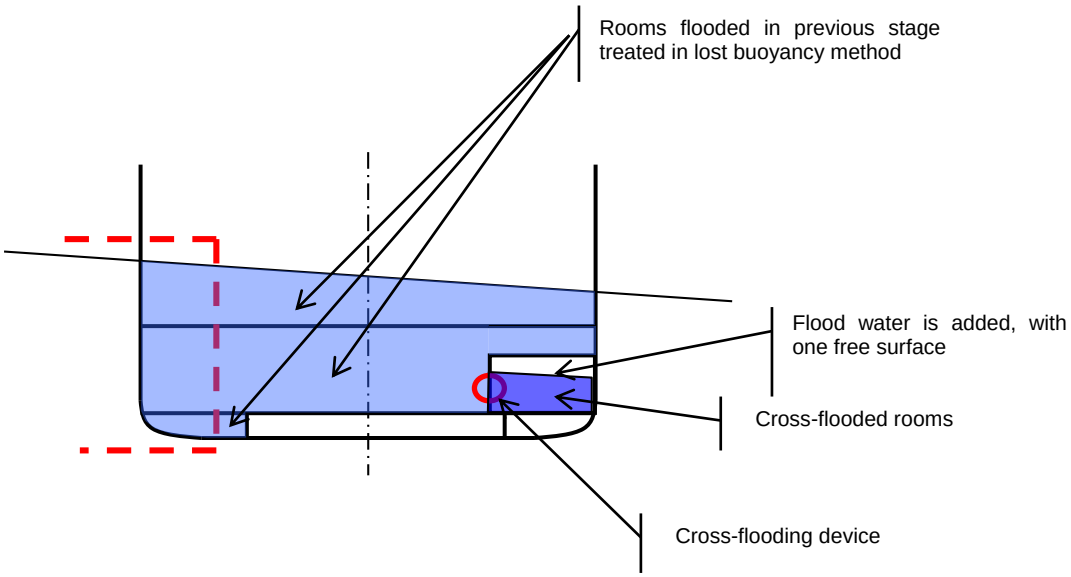
The examples below present a simplified, sequential approach to intermediate stage down-flooding and cross-flooding. Because simultaneous down-flooding and cross-flooding is not accounted for, any time-to-flood calculated with this sequential approach should be conservative. Alternative approaches, such as time-domain* flooding simulation, are also acceptable.

Example 1: Major damage with cross-flooding device

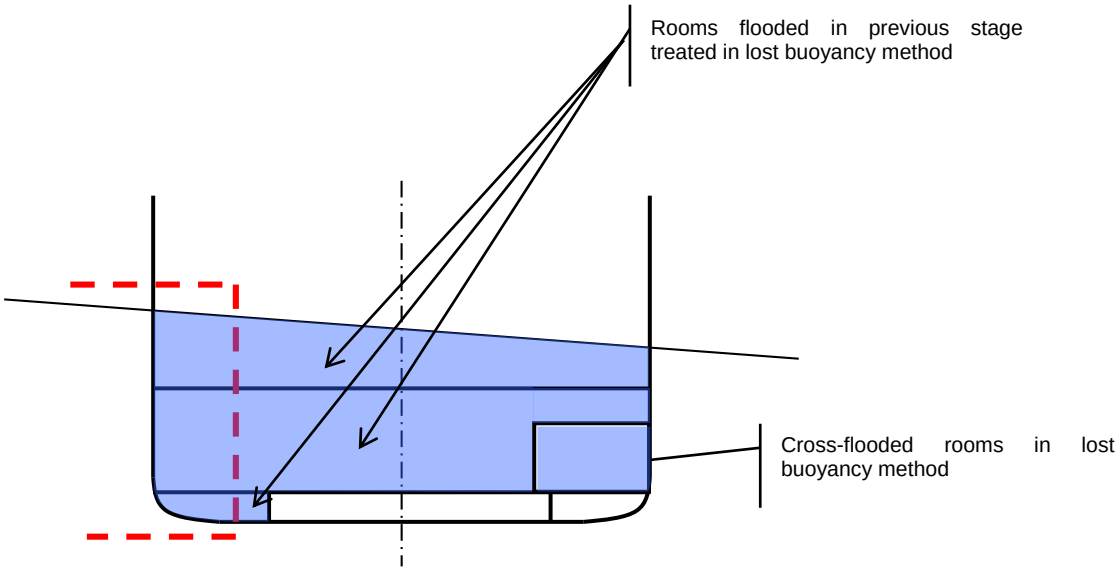
Stage 0: Unrestricted spaces in way of damage should be considered as flooded immediately (intermediate phases are not considered). The lost buoyancy method is applied as this is a full (final) phase. Provided the ship does not capsize and remains at a floating position from which cross-flooding can proceed, stage 0 need not be taken into account for the s_{factor} calculation as the first intermediate stage to be calculated is after 60 seconds. See cross-flooding/equalization explanatory note 5 below.



Stage 1: Cross-flooding of opposite room



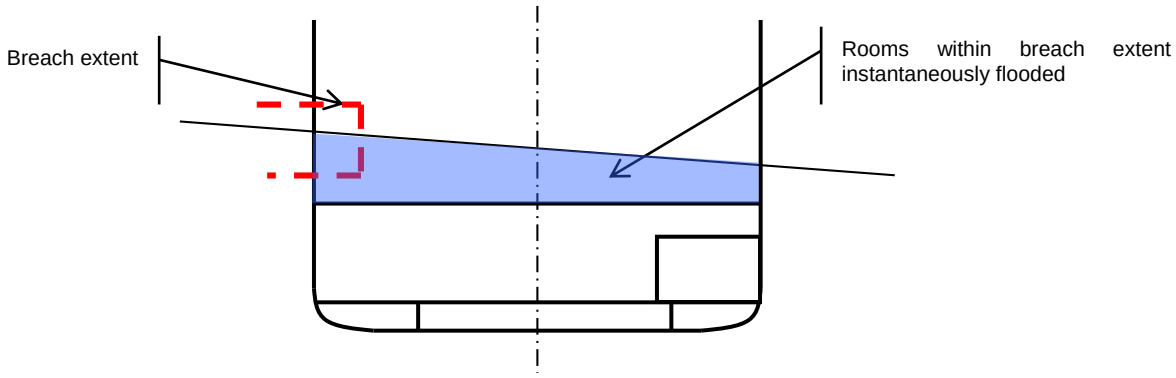
An intermediate phase



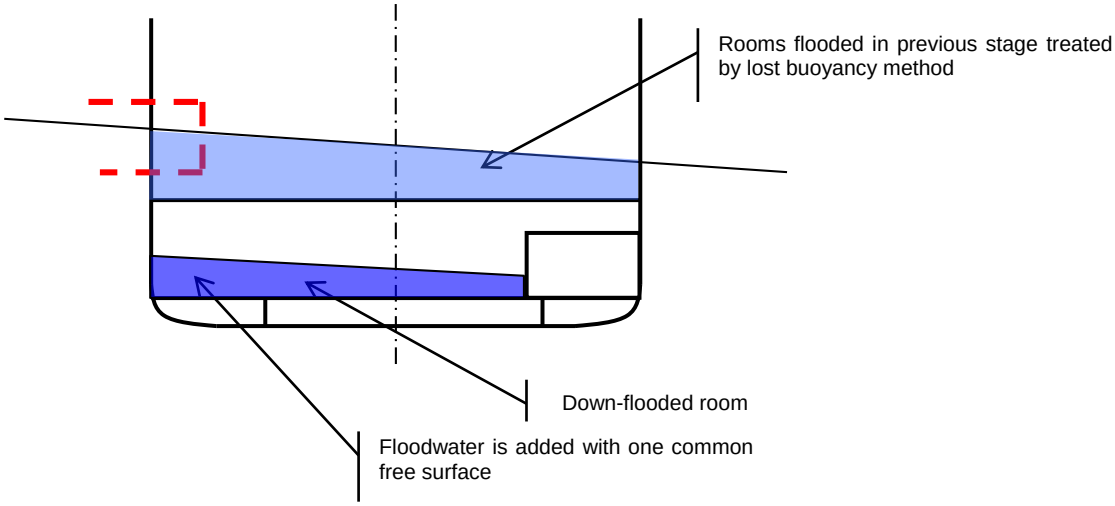
Full (final) phase of flooding stage 1

Example 2: Minor damage with down-flooding and cross-flooding

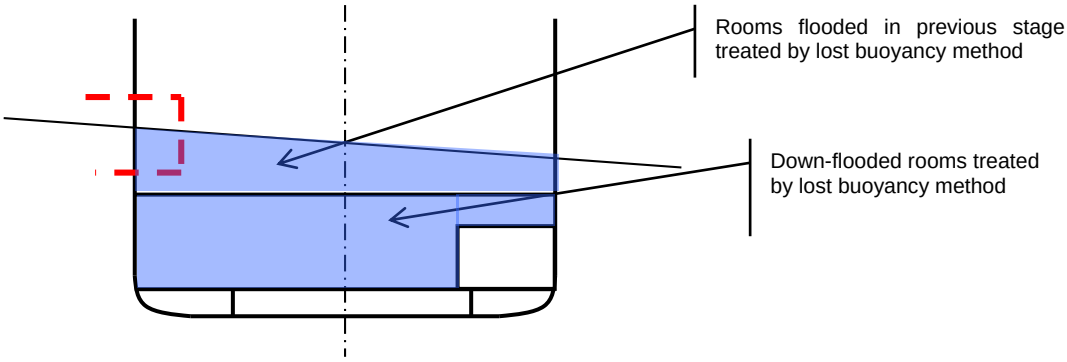
Stage 0: Unrestricted spaces in way of damage should be considered as flooded immediately (intermediate phases are not considered). The lost buoyancy method is applied as this is a full (final) phase. Provided the ship does not capsize and remains at a floating position from which cross-flooding can proceed, stage 0 need not be taken into account for the s_{factor} calculation as the first intermediate stage to be calculated is after 60 seconds. See cross-flooding/equalization explanatory note 5 below.



Stage 1: Down-flooding through non-watertight deck

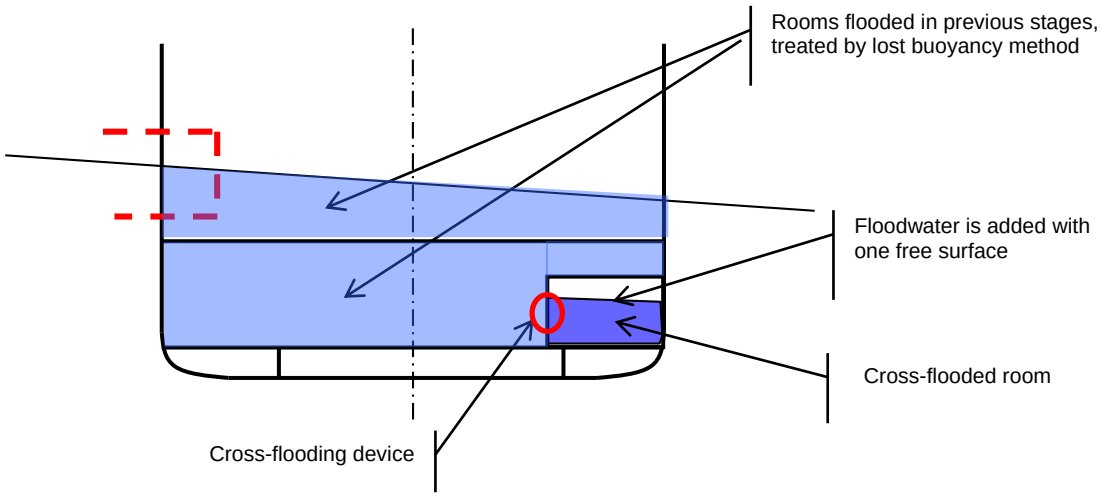


An intermediate phase

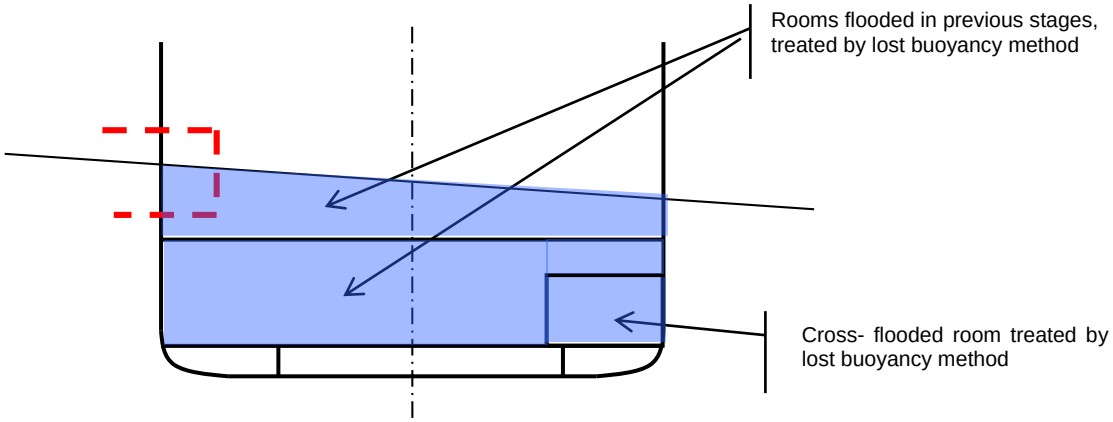


Final (full) phase of stage 1

Stage 2: Cross-flooding



An intermediate phase



Full (final) phase of stage 2

Cross-flooding/equalization

4 In general, cross-flooding is flooding of an undamaged space of the ship to reduce the heel in the final equilibrium condition.

5 The cross-flooding time should be calculated in accordance with the *Revised recommendation on a standard method for evaluating cross-flooding arrangements* (resolution MSC.362(92)). If complete fluid equalization occurs in 60 s or less, it should be treated as instantaneous and no further calculations need to be carried out. Additionally, in cases where $s_{final} = 1$ is achieved in 60 s or less, but equalization is not complete, instantaneous flooding may also be assumed if s_{final} will not become reduced. In any cases where complete fluid equalization exceeds 60 s, the value of $s_{intermediate}$ after 60 s is the first intermediate stage to be considered. Only self-acting open cross-flooding arrangements without valves should be considered effective for instantaneous flooding cases.

6 Provided that the ship has a *GZ* greater than 0 and remains in a position from which cross-flooding can proceed, stage 0 need not be taken into account for the s_{factor} calculation as the first intermediate stage to be calculated is after 60 seconds.

7 Only cross-flooding devices which are sufficiently submerged below the external waterline at stage 0 are to be used in the calculation for cross-flooding according to resolution MSC.362(92).

8 If complete fluid equalization can be finalized in 10 min or less, the assessment of survivability is carried out using the formula in regulation 7-2.1.1 (i.e. as the smallest value of $s_{intermediate}$ or $s_{final} \cdot s_{mom}$)

9 In case the equalization time is longer than 10 min, s_{final} is calculated for the floating position achieved after 10 min of equalization. This floating position is computed by calculating the amount of flood water according to resolution MSC.362(92) using interpolation, where the equalization time is set to 10 min, i.e. the interpolation of the flood water volume is made between the case before equalization (T=0) and the total calculated equalization time. For damage cases involving different cross-flooding devices serving different spaces, when the interpolation between the case before equalization ($T=0$) and the total calculated equalization time is needed for flood water volume calculation after 60 s or 10 min, the total equalization time is to be calculated separately for each cross-flooding device.

10 In any cases where complete fluid equalization exceeds 10 min, the value of s_{final} used in the formula in regulation 7-2.1.1 should be the minimum of s_{final} at 10 min or at final equalization.

11 The factor $s_{intermediate,i}$ may be used for cross-flooding stages if they are intermediate stages which are followed by other subsequent flooding stages (e.g. the flooding stages of non-watertight compartments).

Alternatives

12 As an alternative to the procedure described above in the explanatory notes for regulation 7-2.2, direct calculation using computational fluid dynamics (CFD), time-domain flooding simulations or model testing may be used to analyse intermediate stages of flooding and determine the time for equalization.

Regulation 7-2.3

1 The formulation of $s_{final,i}$ is based on target values for *GZ* and *Range* to achieve s = 1. These values are defined as TGZ_{max} and *TRange*.

2 If ro-ro spaces are damaged there might be the possibility of water accumulation on these deck spaces. To account for this, in any damage case where the ro-ro space is damaged the higher values for TGZ_{max} and *TRange* are to be applied for the calculation of s_i.

Regulation 7-2.4.1.2

The parameter *A* (projected lateral area) used in this paragraph does not refer to the attained subdivision index.

Regulation 7-2.5.2.1

Unprotected openings

1 The flooding angle will be limited by immersion of such an opening. It is not necessary to define a criterion for non-immersion of unprotected openings at equilibrium, because if it is immersed, the range of positive *GZ* limited to flooding angle will be zero so "s" will be equal to zero.

2 An unprotected opening connects two rooms or one room and the outside. An unprotected opening will not be taken into account if the two connected rooms are flooded or none of these rooms are flooded. If the opening is connected to the outside, it will not be taken into account if the connected compartment is flooded. An unprotected opening does not need to be taken into account if it connects a flooded room or the outside to an undamaged room, if this room will be considered as flooded in a subsequent stage.

Openings fitted with a weathertight mean of closing ("weathertight openings")

3 The survival "s" factor will be "0" if any such point is submerged at a stage which is considered as "final". Such points may be submerged during a stage or phase which is considered as "intermediate", or within the range beyond equilibrium.

4 If an opening fitted with a weathertight means of closure is submerged at equilibrium during a stage considered as intermediate, it should be demonstrated that this weathertight means of closure can sustain the corresponding head of water and that the leakage rate is negligible.

5 These points are also defined as connecting two rooms or one room and the outside, and the same principle as for unprotected openings is applied to take them into account or not. If several stages have to be considered as "final", a "weathertight opening" does not need to be taken into account if it connects a flooded room or the outside to an undamaged room if this room will be considered as flooded in a successive "final" stage.

Regulation 7-2.5.2.2

1 Partial immersion of the bulkhead deck may be accepted at final equilibrium. This provision is intended to ensure that evacuation along the bulkhead deck to the vertical escapes will not be impeded by water on that deck. A "horizontal evacuation route" in the context of this regulation means a route on the bulkhead deck connecting spaces located on and under this deck with the vertical escapes from the bulkhead deck required for compliance with SOLAS chapter II-2.

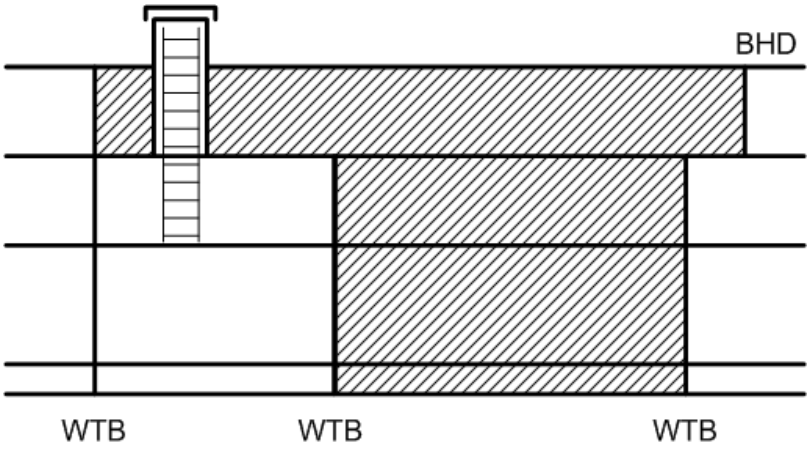
2 Horizontal evacuation routes on the bulkhead deck include only escape routes (designated as category 2 stairway spaces according to SOLAS regulation II-2/9.2.2.3 or as category 4 stairway spaces according to SOLAS regulation II-2/9.2.2.4 for passenger ships carrying not more than 36 passengers) used for the evacuation of undamaged spaces. Horizontal evacuation routes do not include corridors (designated as category 3 corridor spaces according to SOLAS regulation II-2/9.2.2.3 or as category 2 corridor spaces according to SOLAS regulation II-2/9.2.2.4 for passenger ships carrying not more than 36 passengers) or escape routes within a damaged zone. No part of a horizontal evacuation route serving undamaged spaces should be immersed.

3 $s_i = 0$ where it is not possible to access a stair leading up to the embarkation deck from an undamaged space as a result of flooding to the "stairway" or "horizontal stairway" on the bulkhead deck.

Regulation 7-2.5.3.1

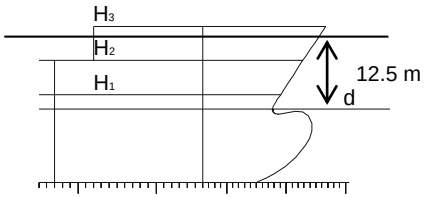
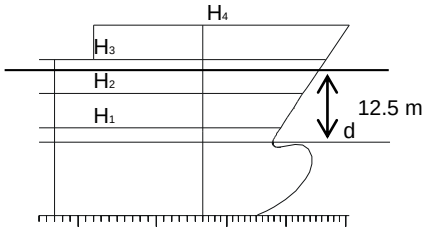
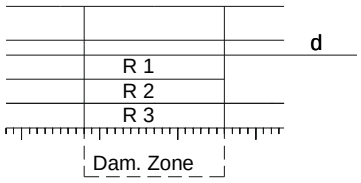
1 The purpose of this paragraph is to provide an incentive to ensure that evacuation through a vertical escape will not be obstructed by water from above. The paragraph is intended for smaller emergency escapes, typically hatches, where fitting of a watertight or weathertight means of closure would otherwise exclude them from being considered as flooding points.

2 Since the probabilistic regulations do not require that the watertight bulkheads be carried continuously up to the bulkhead deck, care should be taken to ensure that evacuation from intact spaces through flooded spaces below the bulkhead deck will remain possible, for instance by means of a watertight trunk.



Regulation 7-2.6

The sketches in the figure illustrate the connection between position of watertight decks in the reserve buoyancy area and the use of factor *v* for damages below these decks.

Above the waterline  	In this example, there are 3 horizontal subdivisions to be taken into account as the vertical extent of damage. The example shows the maximum possible vertical extent of damage *d* + 12.5 m is positioned between H_2 and H_3. H_1 with factor v_1, H_2 with factor $v_2 > v_1$ but $v_2 < 1$ and H_3 with factor $v_3 = 1$.
 	The factors v_1 and v_2 are the same as above. The reserve buoyancy above H_3 should be taken undamaged in all damage cases.
Below the waterline  	The combination of damages into the rooms R1, R2 and R3 positioned below the initial water line should be chosen so that the damage with the lowest *s*-factor is taken into account. That often results in the definition of alternative damages to be calculated and compared. If the deck taken as lower limit of damage is not watertight, down flooding should be considered.

Regulation 7-2.6.1

The parameters x_1 and x_2 are the same as parameters *x1* and *x2* used in regulation 7-1.

REGULATION 7-3 – PERMEABILITY

Regulation 7-3.2

1 The following additional cargo permeabilities may be used:

Spaces	Permeability at draught d_s	Permeability at draught d_p	Permeability at draught d_l
Timber cargo in holds	0.35	0.7	0.95
Wood chip cargo	0.6	0.7	0.95

2 Reference is made to MSC/Circ.998 (IACS Unified Interpretation regarding timber deck cargo in the context of damage stability requirements) regarding timber deck cargo.

Regulation 7-3.3

1 Concerning the use of other figures for permeability "if substantiated by calculations", such permeabilities should reflect the general conditions of the ship throughout its service life rather than specific loading conditions.

2 This paragraph allows for the recalculation of permeabilities. This should only be considered in cases where it is evident that there is a major discrepancy between the values shown in the regulation and the real values. It is not designed for improving the attained value of a deficient ship of regular type by the modification of chosen spaces in the ship that are known to provide significantly onerous results. All proposals should be considered on a case-by-case basis by the Administration and should be justified with adequate calculations and arguments.

REGULATION 8 – SPECIAL REQUIREMENTS CONCERNING PASSENGER SHIP STABILITY

Regulation 8.1

This regulation is intended to ensure a sufficient safety level if a large compartment is located aft of the collision bulkhead.

REGULATION 8-1 – SYSTEM CAPABILITIES AND OPERATIONAL INFORMATION AFTER A FLOODING CASUALTY ON PASSENGER SHIPS

Regulation 8-1.2

1 In the context of this regulation, "compartment" has the same meaning as defined under regulation 7-1 of these Explanatory Notes (i.e. an on-board space within watertight boundaries).

2 The purpose of the paragraph is to prevent any flooding of limited extent from immobilizing the ship. This principle should be applied regardless of how the flooding might occur. Only flooding below the bulkhead deck need be considered.

REGULATION 9 – DOUBLE BOTTOMS IN PASSENGER SHIPS AND CARGO SHIPS OTHER THAN TANKERS

Regulation 9.1

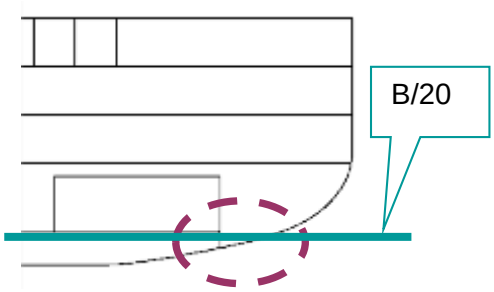
1 This regulation is intended to minimize the impact of flooding from a minor grounding. Special attention should be paid to the vulnerable area at the turn of the bilge. When justifying a deviation from fitting an inner bottom an assessment of the consequences of allowing a more extensive flooding than reflected in the regulation should be provided.

2 The determination regarding the requirement to fit a double bottom "as far as this is practicable and compatible with the design and proper working of the ship" is made, or should be accepted by, the Administration or a recognized organization acting on its behalf.

Compliance with the damage stability requirement in regulation 9.8 should not be considered as an equivalent optional requirement to the fitting of a dimensionally compliant double bottom. This is because a flooded watertight compartment, such as an engine room, that complies with the damage stability requirement in regulation 9.8 is not equivalent to a flooded double bottom below that compartment. Compliance with the damage stability requirement in regulation 9.8 is intended to provide a minimum level of safety in cases when the fitting of a double bottom is not practicable or compatible with the design and proper working of the ship.

Regulation 9.2

1 Except as provided in regulations 9.3 and 9.4, parts of the double bottom not extended for the full width of the ship as required by regulation 9.2 should be considered an unusual arrangement for the purpose of this regulation and should be handled in accordance with regulation 9.7. An example is provided below.



2 If an inner bottom is located higher than the partial subdivision draught d_p, this should be considered an unusual arrangement and is to be handled in accordance with regulation 9.7.

Regulations 9.3.2.2, 9.6 and 9.7

For cargo ships of less than 80 m in length (*L*), the alternative arrangements to provide a level of safety satisfactory to the Administration should be limited to compartments not having a double bottom, having an unusual bottom arrangement, or having an "other well" extending below the required double bottom height that is greater than the *h*/2 or 500 mm limit indicated in regulation 9.3.2.1. In these cases compliance with the bottom damage standard in regulation 9.8 should be demonstrated assuming that the damage will only occur between the transverse watertight bulkheads in compartments not having a double bottom, having an unusual bottom arrangement, or having an "other well" extending below the required double bottom height that is greater than the *h*/2 or 500 mm limit indicated in regulation 9.3.2.1.

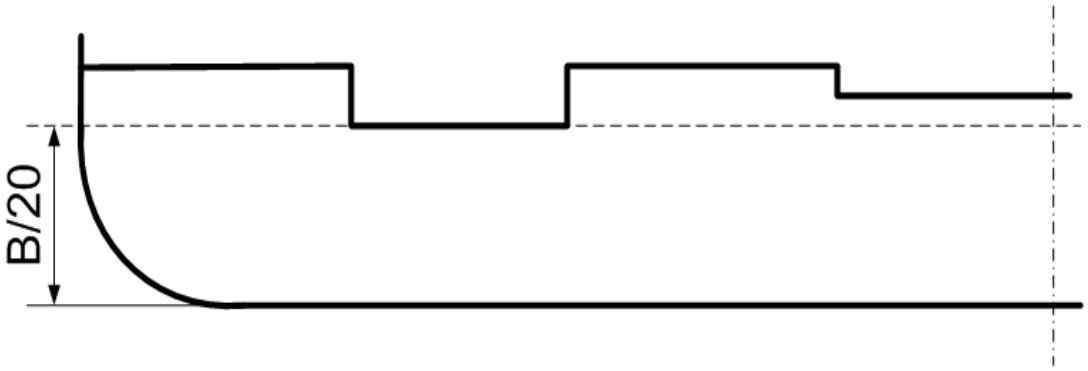
Regulation 9.6

1 Any part of a passenger ship or a cargo ship of 80 m in length (*L*) and upwards where a double bottom is omitted in accordance with regulation 9.1, 9.4 or 9.5 shall be capable of withstanding bottom damages, as specified in regulation 9.8. The intent of this provision is to specify the circumstances under which the Administration should require calculations, which damage extents to assume and what survival criteria to apply when double bottoms are not fitted.

2 The definition of "watertight" in regulation 2.17 implies that the strength of inner bottoms and other boundaries assumed to be watertight should be verified if they are to be considered effective in this context.

Regulation 9.7

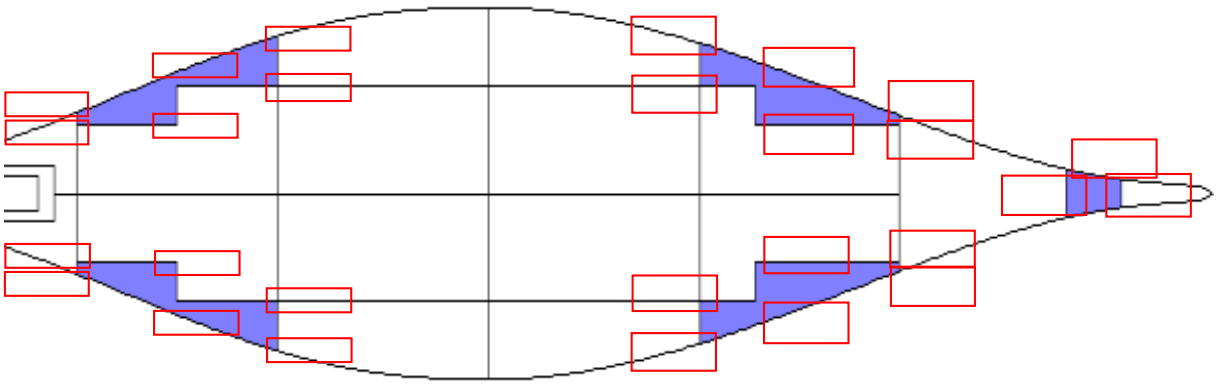
The reference to a "plane" in regulation 9.2 does not imply that the surface of the inner bottom may not be stepped in the vertical direction. Minor steps and recesses need not be considered unusual arrangements for the purpose of this paragraph as long as no part of the inner bottom is located below the reference plane. Discontinuities in way of wing tanks are covered by regulation 9.4.



Regulation 9.8

1 For ships to which the probabilistic damage stability requirements of part B-1 apply, the term "all service conditions" used in this paragraph means the three loading conditions with all trims used to calculate the attained subdivision index *A*. For ships not subject to the probabilistic damage stability requirements in part B-1, such as cargo ships that comply with the subdivision and damage stability requirements of other instruments as allowed by regulation II-1/4.2.1.2 and cargo ships of less than 80 m in length (*L*), "all service conditions" means that the limit curves or tables required by regulation 5-1.2.1 should include values calculated for the same draught and trim range(s) as for the other applicable stability requirements.

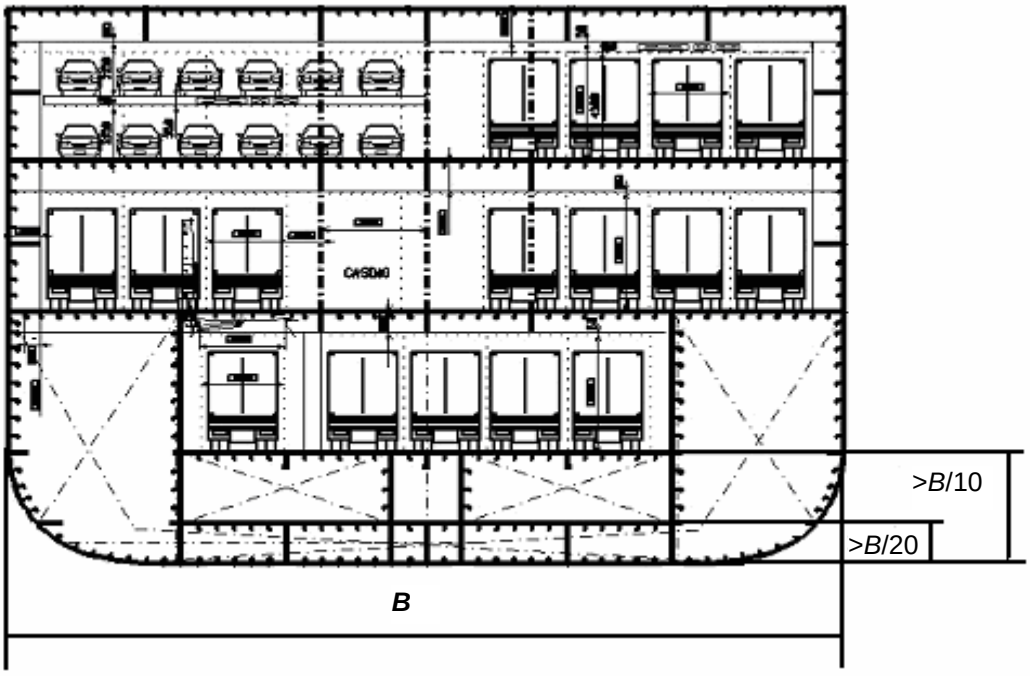
2 The damage extents specified in this paragraph should be applied to all parts of the ship where no double bottom is fitted, as permitted by regulations 9.1, 9.4 or 9.5, and include any adjacent spaces located within the extent of damage. Small wells in accordance with regulation 9.3.1 do not need to be considered damaged even if within the extent of the damage. Possible positions of the damages are shown in an example below (parts of the ship not fitted with a double bottom are shaded; the damages to be assumed are indicated by boxes).



Regulation 9.9

1 For the purpose of identifying "large lower holds", horizontal surfaces having a continuous deck area greater than approximately 30% in comparison with the waterplane area at subdivision draught should be taken to be located anywhere in the affected area of the ship. For the alternative bottom damage calculation, a vertical extent of *B*/10 or 3 m, whichever is less, should be assumed.

2 The increased minimum double bottom height of not more than *B*/10 or 3 m, whichever is less, for passenger ships with large lower holds, is applicable to holds in direct contact with the double bottom. Typical arrangements of ro-ro passenger ships may include a large lower hold with additional tanks between the double bottom and the lower hold, as shown in the figure below. In such cases, the vertical position of the double bottom required to be *B*/10 or 3 m, whichever is less, should be applied to the lower hold deck, maintaining the required double bottom height of *B*/20 or 2 m, whichever is less (but not less than 760 mm). The figure below shows a typical arrangement of a modern ro-ro passenger ferry.



REGULATION 10 – CONSTRUCTION OF WATERTIGHT BULKHEADS

Regulation 10.1

For the treatment of steps in the bulkhead deck of passenger ships see explanatory notes for regulation 13. For the treatment of steps in the freeboard deck of cargo ships see explanatory notes for regulation 13-1.

REGULATION 12 – PEAK AND MACHINERY SPACE BULKHEADS, SHAFT TUNNELS, ETC.

Regulation 12.6.1

For cargo ships, the following figures show examples of suitable butterfly valve arrangements:

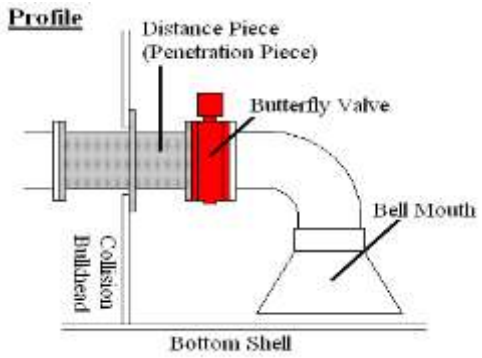


Figure 1

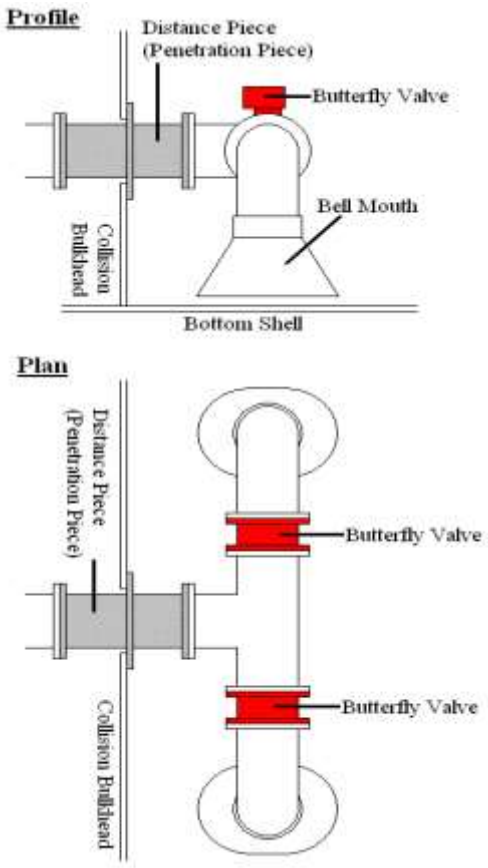


Figure 2

As butterfly valves must be capable of being remotely operated the following shall apply:

.1 the actuator shall be of a double acting type;

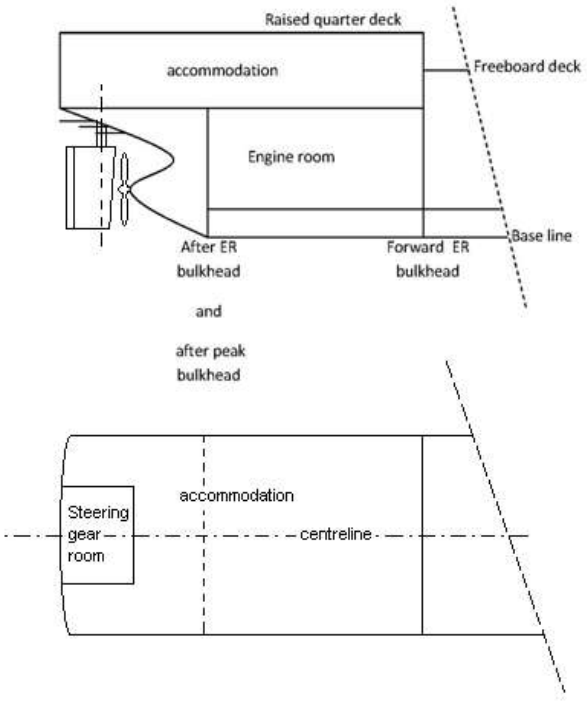
.2 when subject to loss of power, the actuator shall remain in its current position; and

.3 when subject to loss of power, the valve shall be able to be manually operated.

Regulation 12.10

1 In cargo ships the after engine room bulkhead can be regarded as the afterpeak bulkhead provided that the after peak adjoins the engine room.

2 In cargo ships with a raised quarter deck, it may be impracticable to extend the afterpeak bulkhead to the freeboard deck as the freeboard deck does not extend to the aft perpendicular. Provided that the afterpeak bulkhead extends above the deepest load line, and that all rudderstock bearings are housed in a watertight compartment without open connection to spaces located in front of the afterpeak bulkhead, termination of the afterpeak bulkhead on a watertight deck lower than the freeboard deck can be accepted by the Administration.



Regulation 12.11

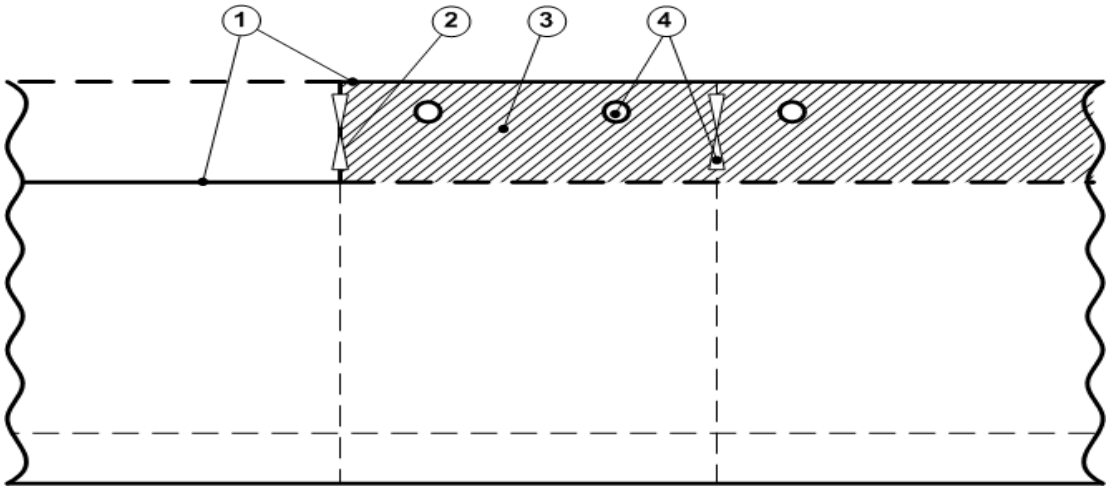
In cargo ships a stern tube enclosed in a watertight space of moderate volume, such as an afterpeak tank, where the inboard end of the stern tube extends through the afterpeak/engine room watertight bulkhead into the engine room is considered to be an acceptable solution satisfying the requirement of this regulation, provided the inboard end of the stern tube is effectively sealed at the afterpeak/engine room bulkhead by means of an approved watertight/oiltight gland system.

REGULATION 13 – OPENINGS IN WATERTIGHT BULKHEADS BELOW THE BULKHEAD DECK IN PASSENGER SHIPS

General – Steps in the bulkhead deck

1 If the transverse watertight bulkheads in a region of the ship are carried to a higher deck which forms a vertical step in the bulkhead deck, openings located in the bulkhead at the step may be considered as being located above the bulkhead deck. Such openings should then comply with regulation 17 and should be taken into account when applying regulation 7-2.

2 All openings in the shell plating below the upper deck throughout that region of the ship should be treated as being below the bulkhead deck and the provisions of regulation 15 should be applied. See figure below.



1 Bulkhead deck
2 Considered as located above the bulkhead deck
3 Ship's side
4 Considered as located below the bulkhead deck

Regulation 13.2.3

1 For closed piping systems compliance with this regulation is achieved if approved pipe penetrations are fitted at the crossing of watertight bulkheads to ensure that heat-sensitive pipes outside the space affected by the fire remain intact, so that any flooding of the fire affected space does not cause progressive flooding through the piping or pipe penetration.

For open piping systems compliance with this regulation is achieved if approved pipe penetrations are fitted at the crossing of watertight bulkheads as are required for closed piping systems, and additionally each pipe connection to a watertight compartment is fitted with an isolation or non-return valve, as appropriate, to prevent progressive flooding through the piping system after a fire. As an alternative to fitting an isolation or non-return valve, pipes may be routed above the damaged waterline in such a way that progressive flooding is prevented, taking into account the dynamic movements of the ship in a damaged condition.

However, progressive flooding may be taken into account in accordance with regulation 7-2.5.4 instead.

2 For the purpose of this explanatory note the following definitions apply:

A *closed piping system* is a piping system without openings in multiple watertight compartments.

An *open piping system* is a piping system with openings in multiple watertight compartments.

3 Materials used in systems which penetrate watertight bulkheads should be of sufficient strength after exposure to heat or be considered as part of an open piping system.

Closing devices using intumescent material (swelling when exposed to heat) for open piping systems should not be considered equivalent to the fitting of a valve, since the fire might be located too far from the device to create a watertight seal.

4 Approval of pipe penetrations fitted to ensure the watertight integrity of a bulkhead or deck where heat-sensitive materials are used should include a prototype test of watertightness after having undergone the standard fire test appropriate for the location in which the penetrations are to be installed[1].

The fire tested pipe penetration should then be tested to a test pressure of not less than 1.5 times the design pressure as defined in regulation 2.18. The pressure should be applied to the same side of the division as the fire test.

The fire tested pipe penetration should be tested for a period of at least 30 minutes under hydraulic pressure equal to the test pressure, but minimum 1.0 bar. There should be no leakage during this test.

The fire tested pipe penetration should continue to be tested for a further 30 minutes with the test pressure. The quantity of water leakage is not to exceed a total of 1 litre.

The prototype test should be considered valid only for the pipe typology (e.g. thermoplastic and multilayer), pressure classes, the maximum/minimum dimensions tested, and the type and fire rating of the division tested.

5 The pressure test need not be carried out on the hot penetration arrangement. Ample time may be given to prepare for the pressure test, i.e. dismantling the fire testing equipment and rigging the pressure test equipment.

The pressure test should be carried out with the pipe section used in the fire test still in place.

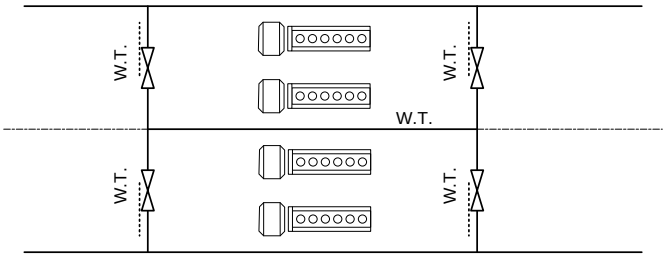
Any pipe insulation fitted for the purpose of the fire test may be removed before the pressure test.

Prototype testing need not be carried out if the pipe penetration is made of steel or equivalent material having a thickness of 3 mm or greater and a length of not less than 900 mm (preferably 450 mm on each side of the division), and there are no openings. Such penetrations shall be suitably insulated by extension of the insulation at the same level of the division. See also regulation II-2/9.3.1 with respect to piping. However, the penetration must still comply with the watertight integrity requirement in regulation 2.17.

[1] Refer to the requirements for A-class division set out in part 3 of annex 1 to the 2010 FTP Code.

Regulation 13.4

In cases where main and auxiliary propulsion machinery spaces, including boilers serving the needs for propulsion, are divided by watertight longitudinal bulkheads in order to comply with redundancy requirements (e.g. according to regulation 8-1.2), one watertight door in each watertight bulkhead may be permitted, as shown in the figure below.



REGULATION 13-1 – OPENINGS IN WATERTIGHT BULKHEADS AND INTERNAL DECKS IN CARGO SHIPS

Regulation 13-1.1

1 If the transverse watertight bulkheads in a region of the ship are carried to a higher deck than in the remainder of the ship, openings located in the bulkhead at the step may be considered as being located above the freeboard deck.

2 All openings in the shell plating below the upper deck throughout that region of the ship should be treated as being below the freeboard deck, similar to the bulkhead deck for passenger ships (see relevant figure under regulation 13 above), and the provisions of regulation 15 should be applied.

REGULATION 15 – OPENINGS IN THE SHELL PLATING BELOW THE BULKHEAD DECK OF PASSENGER SHIPS AND THE FREEBOARD DECK OF CARGO SHIPS

General – Steps in the bulkhead deck and freeboard deck

For the treatment of steps in the bulkhead deck of passenger ships see explanatory notes for regulation 13. For the treatment of steps in the freeboard deck of cargo ships see explanatory notes for regulation 13-1.

REGULATION 15-1 – EXTERNAL OPENINGS IN CARGO SHIPS

Regulations 15-1.1 to 15-1.3 apply to cargo ships which are subject to the damage stability analysis required in part B-1 or other IMO instruments.

Regulation 15-1.1

With regard to air-pipe closing devices, they should be considered weathertight closing devices (not watertight). This is consistent with their treatment in regulation 7-2.5.2.1. However, in the context of regulation 15-1, "external openings" are not intended to include air-pipe openings.

REGULATION 16 – CONSTRUCTION AND INITIAL TESTS OF WATERTIGHT CLOSURES

General

These requirements are only to establish a general design standard for watertight closures. They are not intended to require any non-watertight hatches to be watertight, nor do they override the requirements of the International Convention on Load Lines.

Regulation 16.2

Large doors, hatches or ramps on passenger and cargo ships, of a design and size that would make pressure testing impracticable, may be exempted from regulation 16.2, provided it is demonstrated by calculations that the doors, hatches or ramps maintain watertightness at design pressure with a proper margin of resistance. Where such doors utilize gasket seals, a prototype pressure test to confirm that the compression of the gasket material is capable of accommodating any deflection, revealed by the structural analysis, should be carried out. After installation every such door, hatch or ramp should be tested by means of a hose test or equivalent.

Note: See explanatory notes for regulation 13 for additional information regarding the treatment of steps in the bulkhead deck of passenger ships. See explanatory notes for regulation 13-1 for additional information regarding the treatment of steps in the freeboard deck of cargo ships.

REGULATION 17 – INTERNAL WATERTIGHT INTEGRITY OF PASSENGER SHIPS ABOVE THE BULKHEAD DECK

General – Steps in the bulkhead deck

For the treatment of steps in the bulkhead deck of passenger ships see explanatory notes for regulation 13.

Regulation 17.1

1 Sliding watertight doors with a reduced pressure head that are located above the bulkhead deck and which are immersed in the final or during any intermediate stage of flooding should comply fully with the requirements of regulation 13. These types of sliding watertight doors tested with reduced pressure head must not be immersed at any stage of flooding by a head of water higher than the tested pressure head. See figure 1 below. These sliding watertight doors shall be kept closed during navigation in compliance with the requirements of regulation 22 and this should be clearly indicated in the damage control information required by regulation 19.

2 If watertight doors are located above the worst final and above the worst intermediate waterline in damage cases contributing to the attained subdivision index *A*, but within the area where the door becomes intermittently immersed (fully or partly) at angles of heel in the required range of positive stability beyond the equilibrium position, such doors are to be power operated and remotely controlled sliding semi-watertight doors complying with the requirements of regulation 13, except that the scantlings and sealing requirements could be reduced to the maximum head of water caused by the waterline being intermittently immersed (see figure 1 below). These doors should be closed in case of damage and this should be clearly indicated in the damage control information required by regulation 19.

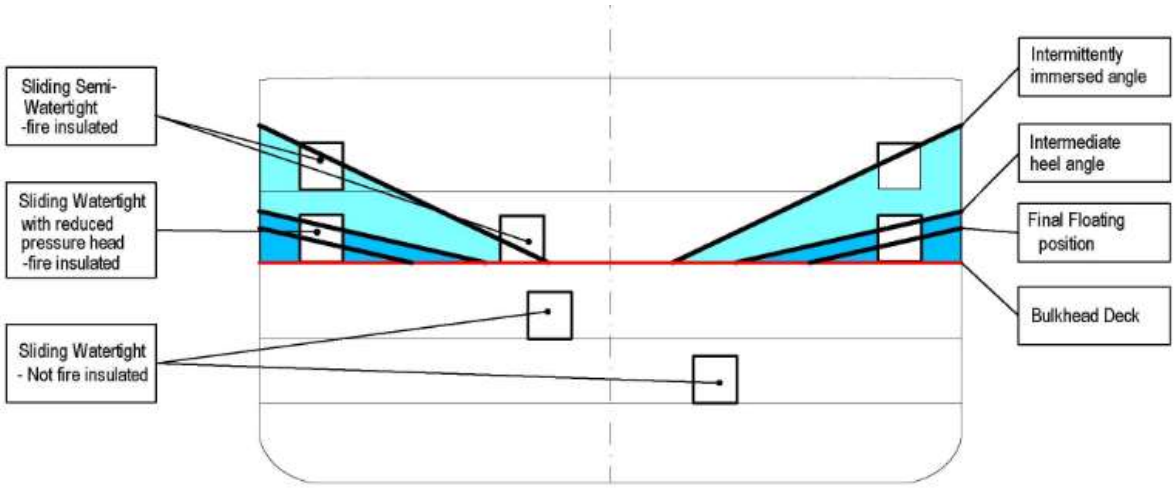


Figure 1

3 The use of watertight sliding doors above the bulkhead deck affects the escape provisions of regulation II-2/13. When such doors are used above the bulkhead deck, there should be at least two means of escape from each main vertical zone or similarly restricted space or group of spaces, at least one of which should be independent of watertight doors and at least one of which should give access to a stairway forming a vertical escape. Sliding watertight doors that will be used frequently by passengers must not create a tripping hazard.

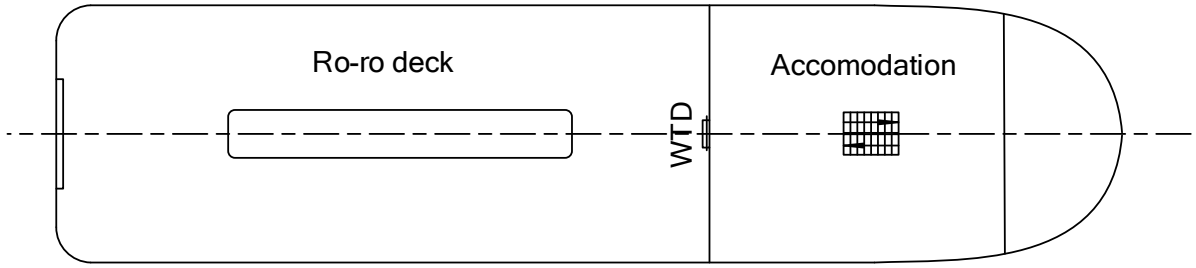
4 Doors fitted above the bulkhead deck, which are required to meet both fire protection and watertight requirements should comply with the fire requirements in regulation II-2/9.4.1.1 and the watertight requirements in paragraphs 1 and 2 above. Notwithstanding the ultimate sentence of regulation II-2/9.4.1.1.2, watertight doors fitted above the bulkhead deck should be insulated to the standard required by table 9.1 and regulation II-2/9.2.2.1.1.1. The door must be capable of operation using both the remote fire door control circuit and the remote watertight door control circuit. If two doors are fitted, they must be capable of independent operation. The operation of either door separately must not preclude closing of the other door. Both doors must be capable of being operated from either side of the bulkhead.

Regulation 17.3

This paragraph is intended to ensure that progressive flooding through air pipes of volumes located above a horizontal division in the superstructure, which is considered as a watertight boundary when applying regulation 7-2.6.1.1, will be taken into consideration if a side or bottom damage would cause flooding via tanks or spaces located below the waterline.

REGULATION 17-1 – INTEGRITY OF THE HULL AND SUPERSTRUCTURE, DAMAGE PREVENTION AND CONTROL ON RO-RO PASSENGER SHIPS

Regulations 17-1.1.1 and 17-1.1.3 apply only to direct accesses from a ro-ro space to spaces located below the bulkhead deck. The operation of doors in bulkheads separating a ro-ro space and other spaces should be limited to compliance with regulation 23.3.



REGULATION 22 – PREVENTION AND CONTROL OF WATER INGRESS, ETC.

The word "port" used in this regulation includes all berths and sheltered locations where loading and/or discharging may take place.

APPENDIX

GUIDELINES FOR THE PREPARATION OF SUBDIVISION AND DAMAGE STABILITY CALCULATIONS

1 GENERAL

1.1 Purpose of the Guidelines

1.1.1 These Guidelines serve the purpose of simplifying the process of the damage stability analysis, as experience has shown that a systematic and complete presentation of the particulars results in considerable saving of time during the approval process.

1.1.2 A damage stability analysis serves the purpose to provide proof of the damage stability standard required for the respective ship type. At present, two different calculation methods, the deterministic concept and the probabilistic concept are applied.

1.2 Scope of analysis and documentation on board

1.2.1 The scope of subdivision and damage stability analysis is determined by the required damage stability standard and aims at providing the ship's master with clear intact stability requirements. In general, this is achieved by determining *KG*-respective *GM*-limit curves, containing the admissible stability values for the draught range to be covered.

1.2.2 Within the scope of the analysis thus defined, all potential or necessary damage conditions will be determined, taking into account the damage stability criteria, in order to obtain the required damage stability standard. Depending on the type and size of ship, this may involve a considerable amount of analyses.

1.2.3 Referring to SOLAS chapter II-1, regulation 19, the necessity to provide the crew with the relevant information regarding the subdivision of the ship is expressed, therefore plans should be provided and permanently exhibited for the guidance of the officer in charge. These plans should clearly show for each deck and hold the boundaries of the watertight compartments, the openings therein with means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding. In addition, Damage Control Booklets containing the aforementioned information should be available.

2 DOCUMENTS FOR SUBMISSION

2.1 Presentation of documents

The documentation should begin with the following details: principal dimensions, ship type, designation of intact conditions, designation of damage conditions and pertinent damaged compartments, *KG*-respective *GM*-limit curve.

2.2 General documents

For the checking of the input data, the following should be submitted:

.1 main dimensions;

.2 lines plan, plotted or numerically;

.3 hydrostatic data and cross curves of stability (including drawing of the buoyant hull);

.4 definition of sub-compartments with moulded volumes, centres of gravity and permeability;

.5 layout plan (watertight integrity plan) for the sub-compartments with all internal and external opening points including their connected sub-compartments, and particulars used in measuring the spaces, such as general arrangement plan and tank plan. The subdivision limits, longitudinal, transverse and vertical, should be included;

.6 light service condition;

.7 load line draught;

.8 coordinates of opening points with their level of tightness (e.g. weathertight, unprotected);

.9 watertight door location with pressure calculation;

.10 side contour and wind profile;

.11 cross and down flooding devices and the calculations thereof according to resolution MSC.362(92) with information about diameter, valves, pipe lengths and coordinates of inlet/outlet;

.12 pipes in damaged area when the destruction of these pipes results in progressive flooding; and

.13 damage extensions and definition of damage cases.

2.3 Special documents

The following documentation of results should be submitted.

2.3.1 Documentation

2.3.1.1 Initial data:

.1 subdivision length L_s;

.2 initial draughts and the corresponding *GM*-values;

.3 required subdivision index *R*; and

.4 attained subdivision index *A* with a summary table for all contributions for all damaged zones.

2.3.1.2 Results for each damage case which contributes to the index *A*:

.1 draught, trim, heel, *GM* in damaged condition;

.2 dimension of the damage with probabilistic values *p*, *v* and *r*;

.3 righting lever curve (including GZ_{max} and range) with factor of survivability s;

.4 critical weathertight and unprotected openings with their angle of immersion; and

.5 details of sub-compartments with amount of in-flooded water/lost buoyancy with their centres of gravity.

2.3.1.3 In addition to the requirements in paragraph 2.3.1.2, particulars of non-contributing damages ($s_i = 0$ and $p_i > 0.00$) should also be submitted for passenger ships and ro-ro ships fitted with long lower holds including full details of the calculated factors.

2.3.2 Special consideration

For intermediate conditions, as stages before cross-flooding or before progressive flooding, an appropriate scope of the documentation covering the aforementioned items is needed in addition.

***

ANNEX 13

DRAFT AMENDMENTS TO SOLAS REGULATIONS II-1/1 AND II-1/8-1*

Regulation 1 – Application

1 The following new paragraphs 1.1.1 and 1.1.2 are inserted after the existing paragraph 1.1:

"1.1.1 Unless expressly provided otherwise, parts B, B-1, B-2 and B-4 of this chapter shall only apply to ships:

.1 for which the building contract is placed on or after 1 January 2020; or

.2 in the absence of a building contract, the keel of which is laid or which are at a similar stage of construction on or after 1 July 2020; or

.3 the delivery of which is on or after 1 January 2024.

1.1.2 Unless expressly provided otherwise, for ships not subject to the provisions of subparagraph 1.1.1 but constructed on or after 1 January 2009, the Administration shall:

.1 ensure that the requirements for parts B, B-1, B-2 and B-4 which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.216(82), MSC.269(85) and MSC.325(90) are complied with; and

.2 ensure that the requirements of regulations 8-1.3 and 19-1 are complied with."

2 The existing paragraph 1.3.4 is deleted.

3 The existing paragraph 2 is replaced with the following:

"2 Unless expressly provided otherwise, for ships constructed before 1 January 2009, the Administration shall:

.1 ensure that the requirements which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57), MSC.19(58), MSC.26(60), MSC.27(61), Resolution 1 of the 1995 SOLAS Conference, MSC.47(66), MSC.57(67), MSC.65(68), MSC.69(69), MSC.99(73), MSC.134(76), MSC.151(78) and MSC.170(79) are complied with; and

.2 ensure that the requirements of regulations 8-1.3 and 19-1 are complied with."

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

Regulation 8-1 – System capabilities and operational information after a flooding casualty on passenger ships

4 The existing text of regulation 8-1 is amended to read as follows:

"**1 Application**

Passenger ships having length, as defined in regulation II-1/2.5, of 120 m or more or having three or more main vertical zones shall comply with the provisions of this regulation.

2 Availability of essential systems in case of flooding damage[*]

A passenger ship ~~constructed on or after 1 July 2010~~ shall be designed so that the systems specified in regulation II-2/21.4 remain operational when the ship is subject to flooding of any single watertight compartment.

3 Operational information after a flooding casualty

3.1 For the purpose of providing operational information to the Master for safe return to port after a flooding casualty, passenger ships ~~constructed on or after 1 January 2014~~, as specified in paragraph 1, shall have:

.1 onboard stability computer; or

.2 shore-based support,

based on the guidelines developed by the Organization.[**]

3.2 Passenger ships constructed before 1 January 2014 shall comply with the provisions in paragraph 3.1 not later than the first renewal survey after [*X years after the date of entry into force*].

---

[*] Refer to the *Interim Explanatory Notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty* (MSC.1/Circ.1369).

[**] Refer to the *Guidelines on operational information for Masters of passenger ships for safe return to port by own power or under tow* (MSC.1/Circ.1400) for ships constructed on or after 1 January 2014 but before 13 May 2016, or the *Revised Guidelines on operational information for masters of passenger ships for safe return to port* (MSC.1/Circ.1532) for ships constructed on or after 13 May 2016, or the guidelines to be developed by the Organization for passenger ships constructed before 1 January 2014."

***

ANNEX 14

RESOLUTION MSC.430(98)
(adopted on 16 June 2017)

AMENDMENTS TO THE REVISED PERFORMANCE STANDARDS FOR NARROW-BAND DIRECT-PRINTING TELEGRAPH EQUIPMENT FOR THE RECEPTION OF NAVIGATIONAL AND METEOROLOGICAL WARNINGS AND URGENT INFORMATION TO SHIPS (NAVTEX) (RESOLUTION MSC.148(77))

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.886(21) on *Procedure for the adoption of, and amendments to, performance standards and technical specifications*, by which the Assembly resolved that the function of adopting performance standards and technical specifications, as well as amendments thereto shall be performed by the Maritime Safety Committee,

HAVING CONSIDERED, at its ninety-eighth session, the recommendation made by the Sub-Committee on Navigation, Communications and Search and Rescue at its fourth session,

1 ADOPTS the amendments to resolution MSC.148(77) on *Revised Performance standards for narrow-band direct-printing telegraph equipment for the reception of navigational and meteorological warnings and urgent information to ships (NAVTEX),* set out in the annex to the present resolution;

2 RECOMMENDS Governments to ensure that NAVTEX receiver equipment installed on or after 1 July 2019 conforms to performance standards not inferior to those set out in the annex to resolution A.148(77), as amended by the annex to the present resolution.

ANNEX

AMENDMENTS TO THE REVISED PERFORMANCE STANDARDS FOR NARROW-BAND DIRECT-PRINTING TELEGRAPH EQUIPMENT FOR THE RECEPTION OF NAVIGATIONAL AND METEOROLOGICAL WARNINGS AND URGENT INFORMATION TO SHIPS (NAVTEX) (RESOLUTION MSC.148(77))

In the existing section 9 the following new paragraph is added:

> "9.4 The equipment should include an interface for alert management in accordance with resolution MSC.302(87) on *Performance standards for bridge alert management*."

***

ANNEX 15

RESOLUTION MSC.431(98)
(adopted on 16 June 2017)

AMENDMENTS TO THE REVISED PERFORMANCE STANDARDS FOR ENHANCED GROUP CALL (EGC) EQUIPMENT (RESOLUTION MSC.306(87))

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.886(21) on *Procedure for the adoption of, and amendments to, performance standards and technical specifications*, by which the Assembly resolved that the function of adopting performance standards and technical specifications, as well as amendments thereto shall be performed by the Maritime Safety Committee,

HAVING CONSIDERED, at its ninety-eighth session, the recommendation made by the Sub-Committee on Navigation, Communications and Search and Rescue at its fourth session,

1 ADOPTS the amendments to resolution MSC.306(87) on *Revised Performance standards for enhanced group call (EGC) equipment*, set out in the annex to the present resolution;

2 RECOMMENDS Governments to ensure that EGC equipment installed on or after 1 July 2019 conforms to performance standards not inferior to those set out in the annex to resolution MSC.306(87), as amended by the annex to the present resolution.

ANNEX

AMENDMENTS TO THE REVISED PERFORMANCE STANDARDS FOR ENHANCED GROUP CALL (EGC) EQUIPMENT (RESOLUTION MSC.306(87))

1 INTRODUCTION

1 The following new paragraph 1.3 is inserted after the existing paragraph 1.2:

> "1.3 Alternatively to the requirement in paragraph 1.2, the equipment need not provide means to produce a printed copy of received information if it is installed in combination with an interface connecting it to navigation equipment that is compliant with resolution MSC 252(83), as amended, on *Revised Performance standards for integrated navigation systems*. Provisions for interconnection to a shipborne integrated radiocommunication system (IRCS) when used in the GMDSS (resolution A.811(19)) should also be included."

and the remaining paragraph is renumbered accordingly.

5 ANTENNA SITING

2 After the existing section 5, insert a new section 6 as follows:

"6 INTERFACES

6.1 The equipment should include at least one interface for the transfer of received data to other navigation display or integrated communications equipment.

6.2 The equipment should include an interface for alert management in accordance with resolution MSC.302(87) on *Performance standards for bridge alert management.*

6.3 All interfaces provided for communication with other navigation or communication equipment should comply with the relevant international standards[1].

[1] Refer to IEC standards 61162"

***

ANNEX 16

RESOLUTION MSC.432(98)
(adopted on 16 June 2017)

AMENDMENTS TO PERFORMANCE STANDARDS FOR MULTI-SYSTEM SHIPBORNE RADIONAVIGATION RECEIVERS (RESOLUTION MSC.401(95))

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.886(21), by which the Assembly resolved that the functions of adopting performance standards for radio and navigational equipment, as well as amendments thereto, should be performed by the Maritime Safety Committee on behalf of the Organization,

HAVING CONSIDERED, at its ninety-eighth session, the recommendation made by the Sub-Committee on Navigation, Communications and Search and Rescue at its fourth session,

1 ADOPTS the amendments to resolution MSC.401(95) on Performance standards for multi-system shipborne radionavigation receivers, set out in the annex to the present resolution;

2 RECOMMENDS Governments to ensure that multi-system shipborne radionavigation receivers installed on or after 31 December 2017, conform to performance standards not inferior to those specified in the annex to resolution MSC.401(95), as amended by annex to the present resolution.

ANNEX

AMENDMENTS TO PERFORMANCE STANDARDS FOR MULTI-SYSTEM SHIPBORNE RADIONAVIGATION RECEIVERS (RESOLUTION A.401(95))

After exiting paragraph 1.7, a new paragraph 1.8 is inserted as follows, and the remaining paragraphs are renumbered accordingly:

> "1.8 Type-specific performance standards for stand-alone shipborne radionavigation receivers should be taken into account when conducting type approval for multi-system receivers in accordance with this resolution."

***

ANNEX 17

RESOLUTION MSC.433(98)
(adopted on 16 June 2017)

GUIDELINES AND CRITERIA FOR SHIP REPORTING SYSTEMS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

HAVING ADOPTED at its sixty-third session by resolution MSC.31(63) regulation V/8-1, of the International Convention for the Safety of Life at Sea (SOLAS), 1974, on ship reporting systems which, inter alia, requires a ship reporting system, when adopted and implemented in accordance with the guidelines and criteria developed by the Organization, to be used by all ships,

HAVING CONSIDERED, at its ninety-eighth session, the recommendation of the Sub-Committee on Navigation, Communications and Search and Rescue at its fourth session,

1 ADOPTS the revised *Guidelines and criteria for ship reporting systems* set out in the annex to the present resolution;

2 INVITES Governments developing ship reporting systems for adoption by the Organization in accordance with SOLAS regulation V/11 to take account of the revised Guidelines and criteria, set out in the annex to the present resolution;

3 ENCOURAGES Governments that operate approved ship reporting systems to consider automated electronic reporting means recognized by the Organization when reviewing their ship reporting systems;

4 REQUESTS the Secretary-General to bring this resolution to the attention of all Contracting Governments to the SOLAS Convention and to Members of the Organization which are not Contracting Governments to the Convention;

5 REVOKES resolutions MSC.43(64), MSC.111(73) and MSC.189(79).

ANNEX

GUIDELINES AND CRITERIA FOR SHIP REPORTING SYSTEMS

CONTENTS

GUIDELINES AND CRITERIA FOR SHIP REPORTING SYSTEMS

PREAMBLE

These guidelines and criteria are associated with SOLAS regulation V/11 and should, in accordance with regulation V/11, be complied with by Contracting Governments when planning and proposing ship reporting systems to the Organization for adoption and implementing such systems after adoption. Ship reporting systems so adopted will be mandatory for use by all ships, certain categories of ships, or ships carrying certain cargoes.

In addition to the adoption of mandatory ship reporting systems, the Organization may also review and recognize those ship reporting systems of a recommendatory nature and Contracting Governments are encouraged to submit such systems to the Organization in accordance with SOLAS regulation V/11. Such systems will be recommended by the Organization for voluntary use in international waters if they comply as near as practicable with SOLAS regulation V/11 and these guidelines and criteria.

1 DEFINITIONS

The following terms are used in connection with matters relating to ship reporting systems:

.1 **Adopted ship reporting system** means a ship reporting system, (hereinafter referred to as a "system") that has been established by a Government or Governments after it has been accepted by the Organization as complying with all requirements of SOLAS regulation V/11.

.2 **Shore-based authority** means the authority or authorities designated by a Contracting Government or Governments with the responsibility for the management and coordination of a system, the interaction with participating ships, and the safe and effective operation of a system. Such an authority may or may not be an authority in charge of a vessel traffic service.

.3 **Interaction between a shore-based authority and a participating ship** means interchange of data between ships participating in a system and a shore-based authority, aimed at enhancing maritime safety or the protection of the marine environment.

.4 **Hazardous cargoes** means:

.4.1 goods classified in the International Maritime Dangerous Goods (IMDG) Code;

.4.2 substances classified in chapter 17 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) and chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code);

.4.3 oils as defined in MARPOL Annex I;

.4.4 noxious liquid substances as defined in MARPOL Annex II;

.4.5 harmful substances as defined in MARPOL Annex III;

.4.6 radioactive materials specified in the International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships (INF Code).

2 GENERAL CONSIDERATIONS FOR ADOPTED SHIP REPORTING SYSTEMS

2.1 Objectives

Ship reporting systems should be considered for adoption by the Organization only if supported by a demonstrated need to address one or more of the following: the improvement of the safety of life at sea, the safety and efficiency of navigation and/or to increase the protection of the marine environment. They may or may not be operated as part of a vessel traffic service.

2.2 Communication

2.2.1 Reports

2.2.1.1 Communication between a shore-based authority and a participating ship should be limited to information essential to achieve the objectives of the system and, unless there is an emergency involving the safety of life at sea or a threat to the marine environment, the information should not be used for any other purpose.

2.2.1.2 The communication system should enable the shore-based authority and the participating ship to exchange information. The communication should be clear and simple and avoid imposing an undue burden on masters, officers of the watch and pilots. If verbal communications are used, the language should enable the shore-based authority and the participating ship to understand each other clearly. Where language difficulties exist and in particular where requested by the master or the shore-based authority, a mutually agreed upon language or English, using the Standard Marine Communication Phrases*, should be used.

2.2.1.3 The initial report required from a ship entering the system should generally be limited to the ship's name, call sign, IMO identification number if applicable, and position.

2.2.1.4 Other supplementary information may also be requested in the initial report if justified in the proposal for adoption as necessary to ensure the effective operation of the system. Such supplementary information required may include, for example, the intended movement of the ship through the area covered by the system, any operational defects or difficulties affecting the ship, and, as set forth in 1.4 above, the general categories of any hazardous cargoes on board.

2.2.1.5 In the case of an emergency or threat to the marine environment, the shore-based authority may request that the participating ship provides as soon as practicable the precise details of any hazardous cargoes, including their location on board the ship.

2.2.1.6 The system should be planned to transmit information quickly and securely in the most effective way.

2.2.2 Technical considerations

2.2.2.1 The reliability of communications and the availability of communication frequencies should be assured. Shore-based authorities, if practicable, should consider automated electronic means of ship reporting, recognised by the Organization, to reduce ships' reporting burden.

* See resolution A.918(22) on IMO Standard Marine Communication Phrases

2.2.2.2 Careful attention should be given to the format and structure of the message and the mode of transmission. Communication should be conducted in conformity with resolution *A.851(20)* on ship reporting, taking into account any other relevant guidelines, criteria, regulations or instruments developed by the Organization. If practicable, ship reporting systems should be automated using available electronic means, recognised by the Organization.

2.3 Shore-based authority

2.3.1 The varying objectives, area of coverage and complexity of a system will dictate the level of staffing of the shore-based authority and the necessary qualifications and standard of training of the operators. These standards should, as appropriate, take account of the recommendations of the Organization*.

2.3.2 For interaction with ships participating in the system, the shore-based authority should be equipped with radio installations compatible with the requirements of SOLAS chapter IV - Radiocommunications and any other electronic means, recognized by the Organization necessary to accomplish the objectives of the system.

2.3.3 The shore-based authority should have the ability to relay information relating to distress, maritime safety or threats to the marine environment without delay to the appropriate national or international maritime authorities, with a view to the initiation of response action.

2.3.4 If necessary for the operation of the system, a shore-based authority should have a database with the capacity to retain, update, supplement and retrieve information once reported. Information retained in the system should be made available only on a selective and secure basis to authorities required to respond to distress, maritime safety or threats to the marine environment.

2.4 Participating ships

2.4.1 Participating ships required by a system to report to a shore-based authority should do so without delay upon entering and, if necessary, when leaving the area of the system in accordance with the provisions of each system so adopted. A ship may be required to provide additional reports or information to update or modify an earlier report.

2.4.2 Failure of a ship's radiocommunication equipment, or other electronic means for communications recognized by the Organization should not, of itself, be considered as a failure to comply with the rules of a reporting system; however, the shipmaster should endeavour to ensure communication is restored as soon as practicable. If a technical failure prevents the ship from reporting, the master should enter the fact and reasons for not reporting in the ship's log.

3 CRITERIA FOR PLANNING, PROPOSING AND IMPLEMENTING ADOPTED SHIP REPORTING SYSTEMS BY CONTRACTING GOVERNMENTS

3.1 Responsibility of the Contracting Government or Governments

It is the responsibility of the Contracting Government or Governments to plan, propose to the Organization and implement systems or amendments to such systems.

3.2 Planning or revising ship reporting system for adoption

3.2.1 A Contracting Government or Governments should establish the objectives and clearly define the area of a system. All information for effective utilization of such a system by mariners

* Refer to resolution A.857(20) on Guidelines for Vessel Traffic Services

should be conveyed to the appropriate maritime administrations and hydrographic authorities at least six months prior to the date of implementation.

3.2.2 In planning or revising a system, Contracting Governments should take account of such factors as:

.1 hydrographical and meteorological elements, such as prevailing winds and currents, shifting shoals, local hazards, aids to navigation, and visibility;

.2 the character of ship traffic, including the density of such traffic, conflicting navigation patterns, narrow fairways, areas where ships converge or cross, the record of maritime casualties, the categories of ships navigating in the area, interference by ship traffic with other marine-based activities, and ships carrying hazardous cargoes or types and quantities of bunker fuel;

.3 environmental considerations;

.4 equipment requirements, and methods of ship-to-shore communication and data processing so as to ensure reliability and clear communication between the shore-based authority and participating ships;

.5 the shore-based facilities (including hardware and software) and the personnel qualifications and training required to support the operation of the proposed system; and

.6 the procedural and communication interfaces of the system with other maritime safety or pollution response systems, including any adjacent ship reporting system.

3.2.3 In planning a system, a Contracting Government should consider whether the authority exists, or should be established, under domestic law to assess violations of any proposed requirements of a system.

3.3 Proposing a ship reporting system to the Organization for adoption

Systems and amendments thereto should be proposed to the Organization for adoption. The proposal should include:

.1 the objectives and demonstrated need for the proposed system;

.2 categories of ships required to participate in the system;

.3 relevant information pertaining to the hydrographical and meteorological elements, the characteristics of ship traffic and any environmental aspects of the area;

.4 the delineation of the reporting system as shown on a nautical chart (type of nautical chart as appropriate) and a description of the system including the geographical coordinates. The coordinates should be given in the WGS 84 datum; in addition, geographical coordinates should also be given in the same datum as the nautical chart if this chart is based on a datum other than WGS 84;

.5 the format and content of the reports required, the times and geographical positions for submitting reports, the shore-based authority to whom these reports should be sent and, if any are to be provided, the available services;

.6 the information to be provided to the participating ship and the procedures to be followed;

.7 the proposed communication requirements for the system, including frequencies on which reports should be transmitted and information to be reported;

.8 the relevant rules and regulations in force in the area of the proposed system;

.9 the shore-based facilities (including hardware and software) and personnel qualifications and training required to support the operation of the proposed system;

.10 a summary of the measures used to date, if any, and the reasons why these measures are considered to be inadequate;

.11 information concerning the applicable procedures if the communication facilities of the shore-based authority fail;

.12 a description, if appropriate, of any plans that have been prepared for responding to an emergency involving the safety of life at sea or threats to the marine environment;

.13 details of the measures to be taken in accordance with 3.4.1.5, if a ship fails to comply with the requirements of the system;

.14 reference to the relevant data exchange standard, if applicable;

.15 necessary provision to consider cyber-risk management guidelines adopted by the Organization*, if applicable;

.16 consideration of automated ship reporting by electronic means, recognised by the Organization, to reduce ships' reporting burden; and

.17 the proposed effective date of the reporting system should be as soon as practicable but not earlier than six months after adoption by the Organization.

3.4 Implementation of an adopted ship reporting system

3.4.1 In implementing a system, Contracting Governments should:

.1 ensure that the shore-based authority is provided with the equipment and facilities necessary to effectively accomplish the objectives of the system;

.2 staff the shore-based authority with appropriately qualified and suitably trained personnel capable of performing the tasks required;

.3 establish operating procedures for routine and emergency situations;

.4 in a timely manner, provide mariners full details of the requirements to be met and the procedures to be followed in the area of the system. This information should include the categories of ships required to participate; areas of applicability; the times and geographical positions for submitting reports; the

* MSC-FAL.1/Circ.3 on Guidelines on maritime cyber risk management

format and content of the required reports; the shore-based authority responsible for the operation of the system; any information to be provided to participating ships; and, if any are to be provided, the types of services available; and

.5 consider whether the failure to comply with a system should be made an offence subject to appropriate measures under domestic law and in accordance with the provisions of SOLAS regulation V/11; however, a technical failure of the communication equipment of a shore-based authority or a ship should be considered to constitute a defence to such measures.

3.4.2 Administrations should require that their ships comply with the requirements of adopted systems. Administrations which have received information of an alleged violation of a system by a ship flying their flag should provide the Government which has reported the offence, with details of any appropriate action taken.

4 CRITERIA FOR ASSESSMENT OF PROPOSALS FOR ADOPTION AND REVIEW OF ADOPTED SHIP REPORTING SYSTEMS BY THE ORGANIZATION

4.1 The Organization will consider each proposal for a system submitted to it by a Contracting Government or Governments.

4.2 In assessing each proposal, the Organization should take into account the information provided in accordance with 3.3.

4.3 If the Organization determines that a proposal for a system does not satisfy the requirements set forth in SOLAS regulation V/11 or these guidelines and criteria, the proposal will be referred back to the appropriate Contracting Government or Governments.

4.4 The Organization should provide a forum for the review and re-evaluation of systems, as necessary, taking into account pertinent comments, reports, and observations of the system. Elements under review might include the reliability of the communication system and the information requested. Contracting Governments which have ships participating in such systems are encouraged to bring any concerns regarding the operation of a system to the attention of the Organization so that any necessary adjustments may be recommended.

4.5 The Organization will determine the effective date for the commencement of operation of the system which should be as soon as practicable, but not earlier than six months after the date of adoption.

4.6 The Organization should, in assessing proposals for the adoption of a system, take into account the technical and financial resources available to developing Contracting Governments and those with economies in transition.

***

ANNEX 18

RESOLUTION MSC.434(98)
(adopted on 16 June 2017)

PERFORMANCE STANDARDS FOR A SHIP EARTH STATION FOR USE IN THE GMDSS

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.886(21), by which the Assembly resolved that the functions of adopting performance standards for radio and navigational equipment, as well as amendments thereto, should be performed by the Maritime Safety Committee on behalf of the Organization,

RECALLING FURTHER regulations IV/10.1 and 14.1 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, concerning radiocommunications for the Global Maritime Distress and Safety System (GMDSS), which require, respectively, that ships remaining in sea area A3 be provided with a ship earth station and that such ship earth stations shall conform to appropriate performance standards not inferior to those adopted by the Organization,

FURTHER RECALLING resolution A.1001(25) by which the Assembly adopted the criteria and requirements for mobile-satellite communication services being designed for use in the GMDSS,

NOTING that the International Mobile Satellite Organization (IMSO) oversees certain public interests in satellites' operations, including the continued provision of satellite services for the GMDSS,

RECOGNIZING the need to prepare performance standards for satellite communication equipment designed in accordance with resolution A.1001(25) in order to ensure the operational reliability of such equipment and to avoid, as far as practicable, adverse interaction between satellite communication equipment and other communication and navigation equipment aboard the ship,

HAVING CONSIDERED, at its ninety-eighth session, the recommendation made by the Sub-Committee on Navigation, Communications and Search and Rescue at its fourth session,

1 ADOPTS the *Performance standards for a ship earth station for use in the GMDSS*, set out in the annex to the present resolution;

2 RECOMMENDS Governments to ensure that every ship earth station which forms part of the GMDSS:

.1 if designed to operate in a mobile satellite service recognized on or after 1 January 2021, complies with the relevant requirements of resolution A.1001(25) and conforms to performance standards not inferior to those specified in the annex to the present resolution; and

.2 if designed to operate on a mobile satellite service recognized before 1 January 2021:

.1 conforms to the relevant requirements of resolution A.1001(25) and to the performance standards not inferior to those specified in the annex to the present resolution; or

.2 conforms to performance standards not inferior to those specified in the annex to:

.1 resolution MSC.130(75) on *Performance standards for Inmarsat ship earth stations capable of two-way communications*, if installed after 1 February 1999;

.2 resolution A.808(19) on *Performance Standards for Ship Earth Stations Capable of Two-Way Communications*, if installed on or after 23 November 1996 and before 1 February 1999;

.3 resolution A.698(17) on *Performance Standards for Ship Earth Stations Capable of Two-Way Communications*, if installed before 23 November 1996;

3 INVITES IMSO to coordinate with the recognized GMDSS service providers with a view to ensuring consistency between their ship earth station design and installation guidelines and the performance standards specified in the annex to the present resolution.

ANNEX

PERFORMANCE STANDARDS FOR A SHIP EARTH STATION FOR USE IN THE GMDSS

1 INTRODUCTION

The ship earth station installation capable of two-way radiocommunications should comply with the general requirements set out in resolutions A.694(17), A.813(19), MSC.191(79), and with the following minimum requirements.

2 TECHNICAL REQUIREMENTS

2.1 General

.1 The ship earth station should operate using a recognized mobile-satellite service and meet the functional requirements of resolution A.1001(25). The ship earth station should comply with the technical standard provided by the recognized mobile-satellite service provider and be certified by this provider for operation in the GMDSS, in order to ensure operational reliability.

.2 The ship earth station should comply with ITU Radio Regulations.

2.2 Functional requirements

.1 The ship earth station should be capable of automatically recognizing the priority of ship-to-ship, ship-to-shore and shore-to-ship communications and should process them in accordance with the message priority defined by the ITU Radio Regulations. The order of processing these communications should be:

.1 distress;

.2 urgency;

.3 safety; and

.4 other communications.

.2 The ship earth station should provide a specific visual indication when unable to detect or otherwise make contact with the satellites of the mobile-satellite system for a period of one minute or more, as referred to in the appendix.

2.3 Integrated systems and equipment interfaces

.1 The equipment should meet the requirements for Bridge Alert Management (BAM) system[1]. Equipment interfaces should comply with recognized international standards. Where the ship earth station is part of an Integrated Communication System (ICS), Integrated Navigation System (INS), Integrated Bridge System (IBS) or connected to a navigation system, this should not impair any of the GMDSS functions of these systems or the ship earth station itself.

[1] Resolutions A.811(19), MSC.252(83) and MSC.302(87); guideline SN.1/Circ.288; international standards IEC 62940, IEC 61924-2 and IEC 62923.

.2 The ship earth station should provide an interface from which data from Enhanced Group Call (EGC) communications, including Maritime Safety Information (MSI), can be provided to navigation display systems, in accordance with recognized international standards.

.3 The ship earth station should provide either an integral electronic position fixing equipment or have an interface for position updating conforming to the recognized international standards.

.4 The ship earth station should provide an interface in accordance with recognized international standards to report a ship's identifier and location data from a received distress alert relay to navigation display systems in order to enable graphical display and possible linking to available target information.

3 OPERATION

3.1 Primary human-machine interface (HMI)

.1 The primary HMI should provide all functions necessary to carry out all communication procedures including those required by the GMDSS.

3.2 Ship earth station identity

.1 No control external to the equipment should be available for alteration of the ship station identity.

3.3 Transmission of distress alerts/calls

.1 It should be possible to initiate transmission of distress alerts/calls at any time. It should be possible to initiate transmission of distress alerts/calls whilst the ship earth station is transmitting lower priority communications, and whilst it is receiving communications of any priority, if necessary by pre-emption of those communications.

.2 It should be possible to initiate and make distress alerts/calls from the position at which the ship is normally navigated. The equipment should include an option making it possible to initiate transmission of distress alerts/calls at a position remote from the primary HMI of the equipment.

.3 The HMI should include a dedicated distress button that has no other function than activating distress transmissions.

.4 A distress alert/call should be activated only by means of a dedicated distress button (a physical button, not a touchscreen button). The dedicated distress button[2] should not be any key of a digital input panel or a keyboard provided on the equipment. The distress button should be clearly identified and protected against inadvertent activation, requiring at least two independent actions. Lifting of the protective lid or cover is considered as the first action. Pressing the distress button as specified above is considered as the second independent action.

[2] MSC/Circ.862.

.5 The distress button should be red in colour and marked "DISTRESS". Where a non-transparent protective lid or cover is used, it should be also be red in colour and marked "DISTRESS".

.6 The required protection of the distress button should consist of a spring-loaded lid or cover permanently attached to the equipment by, e.g. hinges. It should not be necessary for the user to remove additional seals or to break the lid or cover in order to operate the distress button.

.7 The equipment should indicate the status of the distress alert/call. The operation of the distress button should generate a visible and audible indication. The distress button should be kept pressed for at least 3 seconds. A flashing light and an intermittent audible signal should start immediately. After the transmission of the distress alert/call is initiated, the visual indication should become steady and the audible signal should cease.

.8 The equipment should automatically initiate repetitive initial distress alerts/calls, which are repeated until cancelled on the ship or until appropriately acknowledged. It should be possible to interrupt repetitive initial distress alerts/calls. Such operation should not interrupt the transmission of a distress alert/call in progress but should prevent repetitive transmissions of a distress alert/call.

.9 The distress alert should contain identification of the station in distress, its position and the time of the position fix.

.10 The equipment should be capable of transmitting and receiving subsequent distress communication.

.11 After initiating a false distress alert/call, it should be possible to send a cancellation of the alert/call. This cancellation should not be initiated by cutting the power supply to the ship earth station nor by the operator switching the ship earth station off.

3.4 Test facilities

.1 It should be possible to test the distress capability of the ship earth station without initiating a distress alert/call.

3.5 Reception of distress, urgency and safety alerts/calls

.1 It should be possible for the ship earth station to receive distress, urgency and safety priority alerts/calls whilst it is being used for communications of a lower priority than that being received.

.2 Provision should be made for an audible signal and visual indication at the position from which the ship is normally navigated, to indicate receipt of a distress or urgency enhanced group call message. It should not be possible to disable this indication and it should only be possible to reset it manually and only from the position where the message is displayed or printed. The audible signals for distress, urgency and their acknowledgements should be continuously repeated until manually terminated.

.3 For the presentation of received distress and urgency alerts/calls intended as text to be read, the equipment should include or interface to either:

.1 an integrated printing device; or

.2 a dedicated display device[3], printer output port and a non-volatile message memory; or

.3 a connection to a navigation system and a non-volatile message memory.

3.6 Audible signals and visual indications:

.1 The audible signals should be activated in relation to:

.1 distress alert/calls or distress relay alert/calls; and

.2 urgency calls and messages.

.2 For visual indication the ship earth station should conform to MSC 191(79).

.3 BAM classification of priorities and categories is attached as appendix.

3.7 Enhanced Group Call (EGC) messages, including Maritime Safety Information (MSI)

.1 Facilities should be provided for the ship earth station to receive maritime safety information (MSI) for the NAVAREA/METAREA and the coastal warning areas and different classes of messages:

.1 where the ship is sailing and 300 NM beyond the limits of the NAVAREA/METAREA;

.2 for the planned voyage; and

.3 for a fixed position.

Additional means should be provided to filter received MSI based on NAVAREA/METAREA and the coastal warning area codes and different classes of messages.

.2 The station should be able to receive and filter distress relay and urgency messages in accordance with area defined within the EGC message and the ship's position.

.3 For the presentation of received EGC communications intended as text to be read, the equipment should include or interface to either:

.1 an integrated printing device; or

[3] Where there is no printer, the display device should be located in the position from which the ship is normally navigated.

.2 a dedicated display device[4], printer output port and a non-volatile message memory; or

.3 a connection to a navigation system and a non-volatile message memory.

.4 If a dedicated display device or a connection to a navigation system is used, it should meet the general requirements of the Organization for such devices[5] and the following additional requirements:

.1 the capability of showing at least 16 lines by 40 characters, with a non-volatile memory of at least 255 messages of 1,023 characters;

.2 an indication of newly received unsuppressed messages should be immediately displayed until acknowledged, as referred to in the appendix; and

.3 the design and size of the display device should be such that displayed information is easily read under all conditions, by observers at normal working distances and viewing angles.

.5 If a printing device is used, it should meet the general requirements of the Organization for such devices and the following additional requirements:

.1 the printing device should be capable of printing at least the standard International Reference Alphabet (IRA) character set. Other character sets can be optionally used according to ISO 2022[6] standards and ITU-T Recommendations T.50;

.2 the printing device should be able to print at least 40 characters per line;

.3 means should be provided to prevent the re-printing of a message once it has been received without error;

.4 any messages should be displayed or printed regardless of the character error rate of its reception. The equipment should use an asterisk (the "*" character) or a low line (the "_" character) if a corrupted character is received; and

.5 a "paper low" condition should generate a caution, as referred to in the appendix.

.6 For the presentation of received group call messages intended as text to be read, or intended as imagery to be viewed, on another connected device or an integrated system, paragraph 2.3.1 also applies.

---

4 Where there is no printer, the dedicated display device should be located in the position from which the ship is normally navigated.

5 Resolution MSC.191(79).

6 ISO/IEC 2022:1994, Information technology – Character code structure and extension techniques.

3.8 Position updating

.1 Facilities should be provided to automatically update the ship's position and the time at which the position was determined from a suitable electronic position fixing equipment which may be an integral part of the equipment.

.2 To enable updating of the position:

.1 the status of the position update should be visible to the operator (e.g. offline, manual or automatic);

.2 if position data is being updated automatically, a caution should be raised if no update has been performed for a period of 10 minutes, as referred to in the appendix. The caution should be removed by receiving new position data;

.3 the equipment should have facilities for manually entering the ship's position and the time of the position fix;

.4 if the ship's manually-set position is older than 4 hours, a caution should be raised, as referred to in the appendix. The caution should be removed by inputting or receiving new position data; and

.5 if the ship’s position is older than 24 hours, the position is clearly identified with date and time of the fix in UTC for distress alerting purposes.

4 POWER SUPPLY AND SOURCES OF ENERGY

4.1 The ship earth station should normally be powered from the ship's main source of electrical energy. In addition, it should be possible to operate the ship earth station and all equipment necessary for its normal functioning, from an alternative source of electrical energy.

4.2 Changing from one source of supply to another or any interruption of up to 60 seconds duration of the supply of electrical energy should not require the equipment to be manually re-initialized, should not result in loss of received communications stored in the memory and should not render the equipment inoperative when power is restored.

5 ANTENNA SITING

5.1 Where an omni-directional antenna is used, it is desirable that the antenna be sited in such a position that no obstacle is likely to degrade significantly the performance of the equipment. The manufacturer should provide information, in the installation manual, on the required free line of sight and the angles in the fore and aft directions and in the port and starboard directions that are required for reliable operation, taking into account ship movements in heavy seas.

5.2 Where a stabilized directional antenna is used, it is desirable that the antenna be sited in such a position that no obstacle is likely to degrade significantly the performance of the equipment. The manufacturer should provide information in the installation manual, on the required free line of sight and the angles of elevation required for reliable operation, taking into account ship movement in heavy seas.

5.3 For omni-directional antennas, the manufacturer should specify sizes and critical distances of objects related to the antenna which cause a shadow sector, likely to degrade significantly the performance of the equipment, taking into account ship movement in heavy seas. This information should be documented in the installation manual.

5.4 For directional antennas, the manufacturer should specify sizes and critical distances of objects to the antenna, which cause shadow sectors, likely to degrade significantly the performance of the equipment, taking into account ship movement in heavy seas. This information should be documented in the installation manual.

5.5 To ensure reliable and continuous operation of the satellite communication system the manufacturer should specify the necessary distances required between the satellite antenna and marine radar in the installation manual.

5.6 In case of multiple ship earth stations operating on adjacent frequency bands, the antenna should be installed such as to ensure electromagnetic compatibility.

6 RADIO FREQUENCY RADIATION HAZARDS

A warning of potential radiation hazards should be displayed in appropriate locations. A label should be attached external to a radome or antenna indicating the distances at which radiation levels of 100 W/m², 25 W/m² and 10 W/m² exist. These distances should be noted in the user manual.

APPENDIX

CLASSIFICATION OF SHIP EARTH STATION INDICATIONS

BAM classification[7] of ship earth station warnings or cautions, as specified in these performance standards.

Cause	Alarm	Warning	Caution	Category A	Category B
No contact with satellites (referred to in paragraph 2.2.2)			X		X
Received distress communications (referred to in paragraph 3.6)		X		X	
Received urgency message (referred to in paragraph 3.6)		X		X	
Received safety message (referred to in paragraph 3.7.4.2)			X		X
Paper low (referred to in paragraph 3.7.5.5)			X		X
Loss of position (referred to in paragraph 3.8.2.2)			X		X
Manual position older than 4h (referred to in paragraph 3.8.2.4)			X		X

***

[7] As referred to in resolution MSC.302(87)

ANNEX 19

DRAFT AMENDMENTS* TO THE 1994 HSC CODE

Chapter 14 - Radiocommunications

Section 14.2 – Terms and definitions

1 In paragraph 14.2.1, a new subparagraph .16 is added after existing subparagraph .15 as follows:

".16 *Recognized mobile satellite service* means any service which operates through a satellite system and is recognized by the Organization, for use in the GMDSS."

Section 14.6 – Radio equipment: General

2 In paragraph 14.6.1, the existing subparagraph .5 is amended to read as follows:

".5 a radio facility for reception of maritime safety information by the ~~Inmarsat~~ recognized mobile satellite service enhanced group calling system* if the craft is engaged on voyages in ~~any area of Inmarsat coverage~~ sea area A1, or A2 or A3 but in which an international NAVTEX service is not provided. However, craft engaged exclusively on voyages in areas where an HF direct-printing telegraphy maritime safety information service is provided and fitted with equipment capable of receiving such service, may be exempt from this requirement.**

* Refer to resolution A.701(17) concerning *Carriage of Inmarsat enhanced group call SafetyNET receivers under the GMDSS*, adopted by the Organization.

** Refer to the *Recommendation on promulgation of maritime safety information* adopted by the Organization by resolution A.705(17), as amended."

3 In paragraph 14.6.1, the existing subparagraph .6.1 is amended to read as follows:

".6.1 capable of transmitting a distress alert ~~either~~ through the polar orbiting satellite service operating in the 406 MHz band ~~or, if the craft is engaged only on voyages within Inmarsat coverage, through the Inmarsat geostationary satellite service operating in the 1.6 GHz band~~;"

Section 14.7 – Radio equipment: Sea area A1

4 In paragraph 14.7.1, the existing subparagraph .5 is amended to read as follows:

".5 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service; this requirement may be fulfilled by:

.5.1 ~~an Inmarsat~~ a ship earth station* providing a recognized mobile satellite service; or

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

.5.2 the satellite EPIRB, required by 14.6.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

---

* This requirement can be met by Inmarsat ship earth stations capable of two-way communications, such as Fleet 77 (resolution A.808(19) and MSC.130(75)) or Inmarsat-C (resolution A.807(19), as amended) ship earth stations. Unless otherwise specified, this footnote applies to all requirements for an Inmarsat ship earth station prescribed by this chapter."

Section 14.8 – Radio equipment: Sea areas A1 and A2

5 In paragraph 14.8.1, the chapeau of existing subparagraph .3.3 is amended to read as follows:

".3.3 through ~~the Inmarsat geostationary satellite service~~ a ship earth station providing a recognized mobile satellite service; this requirement may be fulfilled by:"

6 In paragraph 14.8.3, the existing subparagraph .2 is amended to read as follows:

".2 ~~an Inmarsat~~ a ship earth station providing a recognized mobile satellite service."

Section 14.9 – Radio equipment: Sea areas A1, A2 and A3

7 In paragraph 14.9.1, the chapeau of existing subparagraph .1 is amended to read as follows:

".1 ~~an Inmarsat a~~ ship earth station providing a recognized mobile satellite service and capable of:"

8 In paragraph 14.9.1, the existing subparagraph .4.3 is amended to read as follows:

".4.3 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service ~~by~~ on an additional ship earth station ~~or by the satellite EPIRB required by 14.6.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated~~."

9 In paragraph 14.9.2, the existing subparagraph .3.2 is amended to read as follows:

".3.2 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service on~~; this Requirement may be fulfilled by:~~

~~.3.2.1~~ a~~n INMARSAT~~ ship earth station;~~ or~~

~~.3.2.2 the satellite EPIRB, required by regulation 14.6.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the ship is normally navigated;~~ and"

Section 14.11 – Watches

10 In paragraph 14.11.1, the existing subparagraph .4 is amended to read as follows:

".4 for satellite shore-to-ship distress alerts, if the craft, in accordance with the requirements of 14.9.1.1, is fitted with ~~an Inmarsat~~ a ship earth station providing a recognized maritime mobile service."

Section 14.12 – Sources of energy

11 In paragraph 14.12.2, the word "Inmarsat" is deleted from the second sentence.

Annex 1

Form of Safety Certificate for High-Speed Craft

High-Speed Craft Safety Certificate

Record of Equipment for Compliance with the International Code of Safety for High-Speed Craft

3 Details of radio facilities

12 In section 1, the existing item 1.4 is amended to read as follows:

"1.4 ~~INMARSAT s~~Ship earth station providing a recognized mobile satellite service"

***

ANNEX 20

DRAFT AMENDMENTS* TO THE 2000 HSC CODE

Chapter 14 - Radiocommunications

Section 14.2 – Terms and definitions

1 In paragraph 14.2.1, the existing subparagraph .6 is amended to read as follows:

".6 *Global maritime distress and safety system (GMDSS) identities* means maritime mobile services identity, the craft's call sign, ~~Inmarsat~~ recognized mobile satellite service identities and serial number identity which may be transmitted by the craft's equipment and used to identify the craft."

2 In paragraph 14.2.1, a new subparagraph .17 is added after existing subparagraph .16 as follows:

".17 *Recognized mobile satellite service* means any service which operates through a satellite system and is recognized by the Organization, for use in the GMDSS."

Section 14.7 – Radio equipment: General

3 In paragraph 14.7.1, the existing subparagraph .5 is amended to read as follows:

".5 a radio facility for reception of maritime safety information by the ~~Inmarsat~~ recognized mobile satellite service enhanced group calling system* if the craft is engaged on voyages in ~~any area of Inmarsat coverage~~ sea area A1, or A2 or A3 but in which an international NAVTEX service is not provided. However, craft engaged exclusively on voyages in areas where an HF direct-printing telegraphy maritime safety information service is provided and fitted with equipment capable of receiving such service, may be exempt from this requirement.**

* Refer to *Carriage of Inmarsat enhanced group call SafetyNET receivers under the GMDSS*, adopted by the Organization by resolution A.701(17).

** Refer to the *Recommendation on promulgation of maritime safety information,* adopted by the Organization by resolution A.705(17), as amended."

4 In paragraph 14.7.1, the existing subparagraph .6.1 is amended to read as follows:

".6.1 capable of transmitting a distress alert ~~either~~ through the polar orbiting satellite service operating in the 406 MHz band ~~or, if the craft is engaged only on voyages within Inmarsat coverage, through the Inmarsat geostationary satellite service operating in the 1.6 GHz band~~;"

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

Section 14.8 – Radio equipment: Sea area A1

5 In paragraph 14.8.1, the existing subparagraph .5 is amended to read as follows:

".5 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service; this requirement may be fulfilled by:

.5.1 ~~an Inmarsat~~ a ship earth station* providing a recognized mobile satellite service; or

.5.2 the satellite EPIRB, required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated.

* This requirement can be met by Inmarsat ship earth stations capable of two-way communications, such as ~~Inmarsat A and B~~ Fleet-77 (resolution A.808(19) and MSC.130(75)) or Inmarsat-C (resolution A.807(19), as amended ~~and MSC.68(68), annex 4~~) ship earth stations. Unless otherwise specified, this footnote applies to all requirements for an Inmarsat ship earth station prescribed by this chapter."

Section 14.9 – Radio equipment: Sea areas A1 and A2

6 In paragraph 14.9.1, the chapeau of existing subparagraph .3.3 is amended to read as follows:

".3.3 through ~~the Inmarsat geostationary satellite service by~~ a ship earth station providing a recognized mobile satellite service; this requirement may be fulfilled by:"

7 In paragraph 14.9.3, the existing subparagraph .2 is amended to read as follows:

".2 ~~an Inmarsat~~ a ship earth station providing a recognized mobile satellite service."

Section 14.10 – Radio equipment: Sea areas A1, A2 and A3

8 In paragraph 14.10.1, the chapeau of existing subparagraph .1 is amended to read as follows:

".1 ~~an Inmarsat~~ a ship earth station providing a recognized mobile satellite service and capable of:"

9 In paragraph 14.10.1, the existing subparagraph .4.3 is amended to read as follows:

".4.3 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service ~~by~~ on an additional ship earth station ~~or by the satellite EPIRB required by 14.7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the craft is normally navigated~~."

10 In paragraph 14.10.2, the existing subparagraph 3.2 is amended to read as follows:

".3.2 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service on~~; this Requirement may be fulfilled by:~~

~~.3.2.1 an INMARSAT~~ ship earth station;~~ or~~

~~.3.2.2 the satellite EPIRB, required by regulation 7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the ship is normally navigated;~~ and"

Section 14.12 – Watches

11 In paragraph 14.12.1, the existing subparagraph .4 is amended to read as follows:

".4 for satellite shore-to-ship distress alerts, if the craft, in accordance with the requirements of 14.10.1.1, is fitted with ~~an Inmarsat~~ a ship earth station providing a recognized maritime mobile service."

Section 14.13 – Sources of energy

12 In paragraph 14.13.2, the word "Inmarsat" is deleted from the second sentence.

Annex 1

Form of High-Speed Craft Safety Certificate and Record of Equipment

Record of Equipment for High-Speed Craft Safety Certificate

Record of Equipment for Compliance with the International Code of Safety for High-Speed Craft, 2000

4 Details of radio facilities

13 In section 1, the existing item 1.4 is amended to read as follows:

"1.4 ~~INMARSAT s~~Ship earth station providing a recognized mobile satellite service"

***

ANNEX 21

DRAFT AMENDMENTS* TO THE 2008 SPS CODE

Annex

Form of Safety Certificate for Special Purpose Ships

Appendix

Record of Equipment for the Special Purpose Ship Safety Certificate (Form SPS)

Record of Equipment for Compliance with the Code of Safety for Special Purpose Ships

3 Details of radio facilities

In section 1, the existing item 1.4 is amended to read as follows:

"1.4 ~~INMARSAT s~~Ship earth station providing a recognized mobile satellite service"

***

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX 22

DRAFT AMENDMENTS* TO SOLAS CHAPTER IV AND APPENDIX (CERTIFICATES)

Chapter IV
Radiocommunications

PART A
GENERAL

Regulation 2 - Terms and definitions

1 In paragraph 1, the existing subparagraph .16 is amended and new subparagraph .17 is added as follows:

".16 *Global maritime distress and safety system (GMDSS) identities* means maritime mobile services identity, the ship's call sign, ~~Inmarsat~~ recognized mobile satellite service identities and serial number identity which may be transmitted by the ship's equipment and used to identify the ship.

.17 *Recognized mobile satellite service* means any service which operates through a satellite system and is recognized by the Organization, for use in the GMDSS."

PART C
SHIP REQUIREMENTS

Regulation 7 – Radio equipment: General

2 In paragraph 1, the existing subparagraph .5 is amended to read as follows:

".5 a radio facility for reception of maritime safety information by the ~~Inmarsat~~ recognized mobile satellite service enhanced group calling system if the ship is engaged on voyages in ~~any area of Inmarsat coverage~~ sea area A1, or A2 or A3 but in which an international NAVTEX service is not provided. However, ships engaged exclusively on voyages in areas where an HF direct-printing telegraphy maritime safety information service is provided and fitted with equipment capable of receiving such service, may be exempt from this requirement.*

* Refer to the *Recommendation on promulgation of maritime safety information* adopted by the Organization by resolution A.705(17), as amended."

Regulation 8 – Radio equipment: Sea area A1

3 In paragraph 1, the existing subparagraph .5 is amended to read as follows:

".5 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service; this requirement may be fulfilled by:

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

.5.1 ~~an Inmarsat~~ a ship earth station* providing a recognized mobile satellite service; or

* This requirement can be met by Inmarsat ship earth stations capable of two-way communications, such as ~~Inmarsat B and~~ Fleet-77 (resolutions A.808(19) and MSC.130(75)) or Inmarsat-C (resolution A.807(19), as amended) ship earth stations. Unless otherwise specified, this footnote applies to all requirements for an Inmarsat ship earth station prescribed by this chapter.

.5.2 the satellite EPIRB, required by regulation 7.1.6, either by installing the satellite EPIRB close to, or by remote activation from, the position from which the ship is normally navigated."

Regulation 9 – Radio equipment: Sea areas A1 and A2

4 In paragraph 1, the existing subparagraph .3.3 is amended to read as follows:

".3.3 through ~~the Inmarsat geostationary satellite service by~~ a ship earth station providing a recognized mobile satellite service."

5 In paragraph 3, the existing subparagraph .2 is amended to read as follows:

".2 ~~an Inmarsat~~ a ship earth station providing a recognized mobile satellite service."

Regulation 10 – Radio equipment: Sea areas A1, A2 and A3

6 In paragraph 1, the existing subparagraph .1 is amended to read as follows:

".1 ~~an Inmarsat~~ a ship earth station providing a recognized mobile satellite service and capable of:"

7 In paragraph 1, the existing subparagraph .4.3 is amended to read as follows:

".4.3 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service ~~by~~ on an additional ship earth station."

8 In paragraph 2, the existing subparagraph .3.2 is amended to read as follows:

".3.2 through ~~the Inmarsat geostationary~~ a recognized mobile satellite service ~~by~~ on a ship earth station; and"

Regulation 12 – Watches

9 In paragraph 1, the existing subparagraph .4 is amended to read as follows:

".4 for satellite shore-to-ship distress alerts, if the ship, in accordance with the requirements of regulation 10.1.1, is fitted with ~~an Inmarsat~~ a ship earth station providing a recognized maritime mobile service."

Regulation 13 – Sources of energy

10 In paragraph 2, the word "Inmarsat" is deleted from the second sentence.

Appendix (Certificates)

RECORD OF EQUIPMENT FOR PASSENGER SHIP SAFETY (FORM P)

11 In part 3, the existing item 1.4 is replaced by the following:

"1.4 ~~Inmarsat s~~Ship earth station providing a recognized mobile satellite service"

RECORD OF EQUIPMENT FOR CARGO SHIP SAFETY RADIO (FORM R)

12 In part 2, the existing item 1.4 is replaced by the following:

"1.4 ~~Inmarsat s~~Ship earth station providing a recognized mobile satellite service"

RECORD OF EQUIPMENT FOR CARGO SHIP SAFETY (FORM C)

13 In part 3, the existing item 1.4 is replaced by the following:

"1.4 ~~Inmarsat s~~Ship earth station providing a recognized mobile satellite service"

***

ANNEX 23

RESOLUTION MSC.435(98)
(adopted on 9 June 2017)

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 2009 (2009 MODU CODE)

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO that the Assembly, when adopting resolution A.1023(26) on the Code for the Construction and Equipment of Mobile Offshore Drilling Units, 2009 (2009 MODU Code), authorized the Committee to amend the 2009 MODU Code, as appropriate, taking into consideration developments in design and technology, in consultation with appropriate organizations,

RECOGNIZING that these requirements and provisions are very similar to the SOLAS requirements and that some of them, being applied to mobile offshore units, may lead to potentially hazardous situations, due to the fact that they have been developed on the basis of typical operations for conventional ships,

RECOGNIZING FURTHER the tragic loss of life and lessons learned from the explosion, fire, and sinking of the mobile offshore drilling unit **Deepwater Horizon** in the Gulf of Mexico, which occurred from 20 to 22 April 2010,

HAVING CONSIDERED, at its ninety-eighth session, the recommendation made by the Sub-Committee on Ship Systems and Equipment, at its fourth session,

1 ADOPTS, the amendments to the Code for the Construction and Equipment of Mobile Offshore Drilling Units, 2009 (2009 MODU Code), as set out in the annex to the present resolution, for mobile offshore drilling units, the keels of which are laid or which are at a similar stage of construction on or after 1 January 2020;

2 INVITES Member States concerned to take appropriate action to give effect to these amendments.

ANNEX

AMENDMENTS TO THE CODE FOR CONSTRUCTION AND EQUIPMENT OF MOBILE OFFSHORE DRILLING UNITS, 2009 (2009 MODU CODE)

CHAPTER 1

GENERAL

1.3 Definitions

1 The following new paragraph 1.3.26, and the associated footnote, are inserted after existing 1.3.25:

"1.3.26 'H' class divisions are those divisions which meet the same requirements as "A" class divisions, as defined in SOLAS regulation II-2/3, except that, when tested according to the Fire Test Procedures Code, the furnace control temperature curve is replaced with the furnace control temperature curve for hydrocarbon fires defined in national or international standards.[1]

[1] Refer to national standards such as: BS EN 1363-2:1999 *Fire resistance tests. Alternative and additional procedures*; or ASTM 1529-14a *Standard Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies;* or ISO/DIS 20902-1 *Fire test procedures for divisional elements that are typically used in oil, gas and petrochemical industries – Part 1: General requirements.*"

2 Existing paragraphs 1.3.26 to 1.3.59 are renumbered accordingly.

CHAPTER 6

MACHINERY AND ELECTRICAL INSTALLATIONS IN HAZARDOUS AREAS FOR ALL TYPES OF UNITS

6.5 Emergency conditions due to drilling operations

3 The text of existing paragraph 6.5.2 is amended to read as follows:

"6.5.2 In the case of units using dynamic positioning systems disconnection or shutdown of machinery and equipment necessary for maintaining the operability of the dynamic positioning system should be based on a shutdown logic system designed to preserve the capability to maintain operational control over the integrity of the well and station keeping capability. Shutdown of generators and related power supply equipment needed for the operation of the dynamic positioning system should be divided into independent groups to allow response to gas detection alarms while maintaining position keeping."

6.6 Electrical installations in hazardous areas

4 In paragraph 6.6.3, the following sentences, and the associated footnote, are added after the existing table 6-1 and its footnote:

"Repairs, maintenance and overhaul of hazardous area certified equipment should be performed by suitably qualified personnel in accordance with appropriate international standards.[27]

There should be maintained a register of electrical equipment installed in the designated hazardous areas, including a description of the equipment, applicable degree of protection and ratings.

[27] Refer to the following International Electrotechnical Commission publications or equivalent for reference to appropriate personnel qualification criteria:

IEC 60079-14:2007 Explosive atmospheres − Part 14: Electrical installations design, selection and erection.

IEC 60079-17:2007 Explosive atmospheres − Part 17: Electrical installations inspection and maintenance.

IEC 60079-19: 2006 Explosive atmospheres − Part 19: Equipment repair, overhaul and reclamation."

CHAPTER 8

PERIODICALLY UNATTENDED MACHINERY SPACES FOR ALL TYPES OF UNITS

8.3 Fire protection

5 In paragraph 8.3.8, the reference to section "9.8" is replaced with "9.9".

CHAPTER 9

FIRE SAFETY

6 In the second sentence of existing paragraph 9.2.4, the reference to "A-60" is replaced with "H-60".

7 The text of existing footnote (e) to tables 9-1 and 9-2 is amended to read:

"(e) Additional provisions for fire boundaries should be assessed in accordance with paragraph 9.3.1."

8 The text of existing paragraph 9.3.1 is amended to read:

"9.3.1 In general, accommodation spaces, service spaces, control stations and spaces containing vital machinery and equipment[30] should not be located adjacent to hazardous areas. However, where this is not practicable, an engineering evaluation should be performed in accordance with national or international standards[31] to ensure that the level of fire protection and blast resistance of the bulkheads and decks separating these spaces from the hazardous areas are adequate for the likely hazard. Where it is shown that

these spaces may be exposed to a radiant heat flux in excess of 100 kw/m^2, the bulkhead or deck should be constructed to at least an "H-60" standard.

---

30 Vital machinery and equipment are those that are essential to the safety of the MODU and all personnel on board. They include, but are not limited to, fire pumps, emergency sources of power, dynamic positioning systems, remote blowout preventer activation controls, and other operational or safety systems the sudden failure of which may result in hazardous situations. This does not include spaces (e.g. the driller's cabin) located on the drill floor.

31 Refer to standards such as: ISO 13702:2015, or API RP 2 FB."

9 The text of existing paragraph 9.4.5 is amended to read:

"9.4.5 Superstructures and deckhouses should be sited such that, in the event of fire at the drill floor, at least one escape route to the embarkation position and survival craft is protected against radiant heat flux levels in excess of 2.5 kW/m^2 emanating from the drill floor."

10 The following new section 9.8 is inserted after existing section 9.7:

"9.8 Fire-extinguishing arrangements for the drill floor

9.8.1 The drill floor should be protected by a fixed pressure water-spraying system designed to provide a minimum water application rate of 20 l/m^2/min to the drill floor and related equipment, including emergency shutdown equipment, critical structural components, and enclosure fire barriers. Alternatively, multiple fixed monitors discharging at a minimum flow rate and pressure 1,900 l/min at 1 N/mm^2 may be provided and arranged such that all areas and equipment can be reached by at least two monitors which are widely separated.

9.8.2 The system should be designed for manual release from release stations located outside the protected area. Any section valves necessary for the operation of the system should be located outside the protected area. Automatic release may be accepted by the Administration.

9.8.3 Nozzles, piping, fittings and related components should be designed to withstand exposure to temperatures up to 925°C.

9.8.4 The main fire pumps may be used to supply the fixed pressure water-spraying system if they have sufficient capacity to simultaneously supply the fire main at the required flow and pressure."

11 Existing sections 9.8 to 9.19 are renumbered accordingly.

12 In the renumbered subparagraph 9.9.2.1, the reference to subparagraph "9.8.1.1" is replaced with "9.9.1.1".

13 In the renumbered paragraph 9.9.4, the reference to paragraphs "9.8.1 to 9.8.3" is replaced with "9.9.1 to 9.9.3".

14 In the renumbered paragraph 9.10.1, the reference to paragraph "9.9.2" is replaced with "9.10.2".

15 In table 9-3, references to sections "9.16" and "9.8" are replaced with "9.17" and "9.9", respectively.

16 In the renumbered subparagraph 9.17.4.6, the reference to subparagraphs "9.16.4.3 to 9.16.4.5" is replaced with "9.17.4.3 to 9.17.4.5".

17 In the renumbered subparagraph 9.17.4.7, the reference to section "9.13" is replaced with "9.14".

18 In the renumbered paragraph 9.20.2, the reference to paragraph "9.19.1" is replaced with "9.20.1".

CHAPTER 10

LIFE-SAVING APPLIANCES AND EQUIPMENT

10.3 Survival craft

19 Add a new chapeau and new paragraphs 10.3.7 and 10.3.8 following existing paragraph 10.3.6:

"***Accounting for anthropomorphic differences in average body mass***

10.3.7 Except as provided in 10.3.8, in applying the provisions of paragraph 4.4.2.2 of the LSA Code and paragraph 6.7.1 of resolution MSC.81(70), part 1, the average body mass of the lifeboat occupant should be assumed to be 95 kg, with a corresponding seat radius of 265 mm.

10.3.8 Where it can be demonstrated that the average body mass of the lifeboat occupants differs from 95 kg, the provisions of paragraph 4.4.2.2 of the LSA Code and paragraph 6.7.1 of resolution MSC.81(70), part 1, may be increased or decreased accordingly. The seat width should be adjusted by 4 mm for each 1 kg difference in average body mass."

10.8 Rescue boats

20 The text of existing section 10.8 is amended to read:

Each unit should carry at least one rescue boat complying with the requirements of the LSA Code. A lifeboat may not be accepted as a rescue boat."

10.9 Stowage of rescue boats

21 The existing paragraph 10.9.5 is deleted and the semicolon at the end of subparagraph 10.9.4 is replaced with a period.

10.10 Rescue boat embarkation, launching and recovery arrangements

22 In paragraph 10.10.3, the second sentence is deleted.

CHAPTER 13

HELICOPTER FACILITIES

13.4 Arrangements

23 In paragraph 13.4.4, the reference to paragraph "9.16.5" is replaced with "9.17.5".

CHAPTER 14

OPERATIONS

14.10 Emergency procedures

24 The following new paragraph 14.10.3 is inserted after existing paragraph 14.10.2:

"14.10.3 For units where a master is assigned, the master should be designated as the person in charge at all times."

25 Existing paragraphs 14.10.3 to 14.10.16 are renumbered accordingly.

14.13 Practice musters and drills

26 In paragraph 14.13.1, the following new sentence is inserted after the existing first sentence:

"A man overboard drill should be conducted at least quarterly."

27 The text of the existing footnote associated to paragraph 14.13.2 and to the title of section 14.15 is replaced with the following:

"Refer to the *Recommendations for the training and certification of personnel on mobile offshore units (MOUs)* (resolution A.1079(28))."

28 The following new paragraph 14.13.5 is inserted after existing paragraph 14.13.4:

"14.13.5 Davit-launched liferafts for MODUs

.1 a liferaft should be lowered at least quarterly during abandon unit drills. Whenever practicable this may include the inflation of a liferaft. This liferaft may be a special liferaft intended for training purposes only and should not be boarded;

.2 the dedicated training liferaft should be identical in size, shape and mass to the actual liferaft cases used on board the unit, but of a different colour and prominently marked 'training aid – not for use in emergency'; and

.3 during such drills, emphasis should be placed on ensuring the crew's familiarity with handling all necessary lashings, painters, connecting the training liferaft to the davit, swinging out the davit and lowering the liferaft."

29 Existing paragraphs 14.13.5 to 14.13.7 are renumbered accordingly.

30 The text of renumbered paragraph 14.13.6 is amended to read as follows:

"14.13.6 As far as is reasonably practicable, rescue boats should be launched each month with the assigned crew aboard and manoeuvred in the water. In all cases these provisions should be complied with at least once every three months during a man overboard drill to simulate the recovery of a person from the water."

31 The text of renumbered paragraph 14.13.7 is amended to read as follows:

"14.13.7 For lifeboats, the provisions of SOLAS regulation III/19.3.4.3 should be applied.[64]

[64] Refer to the *Guidelines on alternative methods for lifeboat drills on MODUs* (MSC.1/Circ.1486)."

14.16 Records

32 In subparagraph 14.16.2.5, the reference to paragraph "9.19.4" is replaced with "9.20.4".

33 In paragraph 14.16.2, the following new subparagraphs .10 and .11 are inserted after existing subparagraph .9, the word "and" at the end of subparagraph 8 is deleted and the period at the end of subparagraph 9 is replaced with a semicolon:

".10 the electrical equipment register under paragraph 6.6.3.

.11 maintenance and repair of all electrical equipment in hazardous areas for continued certification in accordance with the international standards referred to in paragraph 6.6.1."

34 The following new section 14.17 is inserted after existing section 14.16:

"14.17 Hazardous areas

14.17.1 Portable and transportable electrical equipment or spark-producing equipment should not be introduced into, or remain in, any area classified as hazardous area zone 0, zone 1 or zone 2 in accordance with section 6.2 unless it has been determined that:

.1 the equipment is certified as suitable for use in the area in question; or

.2 the area is free of ignitable concentrations of flammable vapours and appropriate controls have been put in place to prevent the introduction of flammable vapours into the area.

14.17.2 Repairs, maintenance and overhaul of certified electrical equipment in hazardous areas should be performed by suitably qualified personnel in accordance with appropriate international standards."

35 All existing footnotes of the Code are renumbered accordingly.

***

ANNEX 24

DRAFT ASSEMBLY RESOLUTION

ESCAPE ROUTE SIGNS AND EQUIPMENT LOCATION MARKINGS

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and the prevention and control of marine pollution from ships,

BEARING IN MIND the requirements of regulations II-2/15.2.4 (Fire control plans), II-2/13.3.2.5.1 (Marking of escape routes), II-2/13.7 (Additional requirements for ro-ro passenger ships), III/9 (Operating instructions), III/11 (Survival craft muster and embarkation arrangements) and III/20.10 (Marking of stowage locations) of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended,

RECALLING resolutions A.760(18) on *Symbols related to life-saving appliances and arrangements,* as amended by resolution MSC.82(70), and A.952 (23) on *Graphical symbols for shipboard fire control plans,*

RECOGNIZING the need for uniform international symbols to indicate the location of emergency equipment as well as muster stations and that the Assembly had urged Contracting Governments to ensure that the symbols annexed to the aforementioned Assembly resolutions were used, where appropriate,

HAVING NOTED that, through the *Shipboard escape route signs and emergency equipment location markings* (MSC.1/Circ.1553), Contracting Governments had been invited to bring standard ISO 24409-2:2014, which generally conforms to the corresponding symbols set out in the annex to resolution A.760(18) on *Symbols related to life-saving appliances and arrangements*, as amended, and in the annex to resolution A.952(23) on *Graphical symbols for fire control plans*, to the attention of ship designers, shipbuilders, shipowners, ship operators, ship masters, shore-based firefighting personnel and other parties concerned, so that they might use it, on a voluntary basis, for shipboard signage, in compliance with the relevant requirements of SOLAS chapters II-2 and III, pending the adoption of the revised resolution,

1 ADOPTS the Escape route signs and equipment location markings, set out in the annex to the present resolution;

2 URGES Contracting Governments to bring the aforementioned escape route signs and equipment location markings to the attention of shipbuilders, shipowners, ship operators, shipmasters, shore-based fire-fighting personnel and other parties concerned with the safety of life at sea for their use within the framework of SOLAS chapters II-2 and III;

3 REQUESTS the Maritime Safety Committee to keep this resolution under review and to amend it as necessary;

4 INVITES Contracting Governments to note that these escape route signs and equipment location markings should take effect on ships constructed on or after [1 January 2018] [1 January 2019] or ships which undergo repairs, alterations, modifications and outfitting within the scope of SOLAS chapters II-2 and/or III, as applicable, on or after [1 January 2019] and that they should be used, as appropriate, in combination with resolution A.952(23) for the preparation of the shipboard fire control plans required by SOLAS regulation II-2/15.2.4.

ANNEX[1]

ESCAPE ROUTE SIGNS AND EQUIPMENT LOCATION MARKINGS

IMPORTANT – The colours represented in this annex can be neither viewed on screen nor printed as true representations. Although the signs and symbols in this annex have been reproduced to correspond (with an acceptable tolerance as judged by the naked eye) to the requirements of standard ISO 3864-4, it is not intended that the signs and symbols shown in this annex be used for colour matching.

For a definitive version of all safety symbols in this annex, please consult standard ISO 7010 and the ISO Online Browsing Platform (http://www.iso.org/obp/ui/**). For a definitive version of all fire control symbols in this annex, please consult standard ISO 17631. These are the source documents from which to create safety and fire control plans signs.**

1 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3864 (all parts), *Graphical symbols – Safety colours and safety signs*

ISO 7010, *Graphical symbols – Safety colours and safety signs – Registered safety signs*

ISO 17631, *Ships and marine technology – Shipboard plans for fire protection, life-saving appliances and means of escape*

ISO 17724, *Graphical symbols – Vocabulary*

ISO 24409-1, *Ships and marine technology – Design, location, and use of shipboard safety signs, safety-related signs, safety notices and safety markings – Part 1: Design principles*

2 Terms and definitions

For the purposes of this document, the terms and definitions given in standards ISO 17724, ISO 24409-1, and the following apply.

2.1 *Fire control signs*

Signs for specialists, used to identify and locate fire control equipment, not designed according the rules for safety signs.

Note 1 to entry: These signs are related to the symbols in standard ISO 17631; see 3.1 h) below.

[1] This annex is based on the standard ISO 24409-2:2014.

2.2 *Image content*

Written description of the elements of a graphical symbol or safety sign and their relative disposition.

[ISO 17724:2003, 38]

2.3 *Referent*

Idea or object that a graphical symbol is intended to represent.

[ISO 17724: 2003, 61]

2.4 *Safety sign*

Sign giving a general safety message, obtained by a combination of a colour and geometric shape and which, by the addition of a graphical symbol, gives a particular safety message.

3 Categorization of shipboard signs

3.1 *Signs in this standard are categorized according to their function as follows:*

a) **MES** – means of escape signs which provide escape route identification.

b) **EES** – emergency equipment signs which provide use and location of first aid facilities and portable safety equipment.

c) **LSS** – life-saving systems and appliances signs which provide use and location of life-saving systems and appliances.

d) **FES** – fire-fighting equipment signs which provide use and location of fire-fighting equipment.

e) **PSS** – prohibition signs which provide prohibited actions.

f) **WSS** – hazard warning signs which provide identification of hazards to avoid.

g) **MSS** – mandatory action signs which provide mandatory notices and instructions.

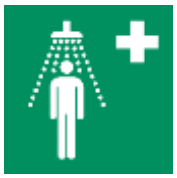
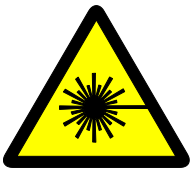
NOTE The PSS, WSS and MSS categories are based on the P, W and M categories of standard ISO 7010.

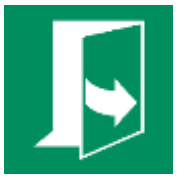
h) **SIS** – safety and operating instructions for trained personnel.

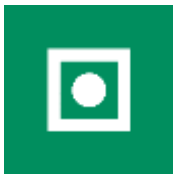
3.2 Table 1 summarizes the standardized shipboard safety signs used in workplaces and public areas in terms of functional category, referent number, referent, graphical symbol as well as geometric shape and colour.

Table 1 — Summary of safety signs for shipboard use

CATEGORY						
MES	EES	LSS	FES	PSS	WSS	MSS
Means of Escape Signs	Emergency Equipment Signs	Lifesaving Signs	Fire-fighting Equipment Signs	Prohibition Signs	Warning Signs	Mandatory Signs
 MES001 (ISO 7010-E032) Shipboard assembly station	 EES001 (ISO 7010-E003) First Aid	 LSS001 (ISO 7010-E036) Lifeboat	 FES001 (ISO 7010-F001) Fire extinguisher	 PSS001 (ISO 7010-P001) General prohibition	 WSS001 (ISO 7010-W001) General warning	 MSS001 (ISO 7010-M001) General Mandatory action
 MES002 (ISO 7010-E001) Emergency exit (left hand)	 EES002 (ISO 7010-E004) Emergency telephone	 LSS002 (ISO 7010-E037) Rescue boat	 FES002 (ISO 7010-F002) Fire hose reel	 PSS002 (ISO 7010-P002) No smoking	 WSS002 (ISO 7010-W002) Warning; Explosive material	 MSS002 (ISO 7010-M002) Refer to instruction manual or booklet
 MES003 (ISO 7010-E002) Emergency exit (right hand)	 EES003 (ISO 7010-E011) Eyewash station	 LSS003 (ISO 7010-E038) Liferaft	 FES003 (ISO 7010-F004) Collection of firefighting equipment	 PSS003 (ISO 7010-P003) No open flame; fire, open ignition source and smoking prohibited	 WSS003 (ISO 7010-W003) Warning; Radioactive material or ionizing radiation	 MSS003 (ISO 7010-M003) Wear ear protection

CATEGORY						
MES	EES	LSS	FES	PSS	WSS	MSS
 MES004 (ISO 7010-E033) Door slides right to open	 EES004 (ISO 7010-E012) Safety shower	 LSS004 (ISO 7010-E039) Davit-launched liferaft	 FES004 (ISO 7010-F005) Fire alarm call point	 PSS004 (ISO 7010-P004) No thoroughfare	 WSS004 (ISO 7010-W004) Warning; Laser beam	 MSS004 (ISO 7010-M004) Wear eye protection
 MES005 (ISO 7010-E034) Door slides left to open	 EES005 (ISO 7010-E013) Stretcher	 LSS005 (ISO 7010-E040) Lifebuoy	 FES005 (ISO 7010-F008) Fixed fire extinguishing battery	 PSS005 (ISO 7010-P005) Not drinking water	 WSS005 (ISO 7010-W005) Warning; Non-ionizing radiation	 MSS005 (ISO 7010-M005) Connect an earth terminal to the ground
 MES 006 (ISO 7010-E018) Turn anti-clockwise to open	 EES006 (ISO 7010-E027) Medical grab bag	 LSS006 (ISO 7010-E041) Lifebuoy with line	 FES006 (ISO 7010-F009) Wheeled fire extinguisher	 PSS006 (ISO 7010-P006) No access for fork lift trucks and other industrial vehicles	 WSS006 (ISO 7010-W006) Warning; Magnetic field	 MSS006 (ISO 7010-M006) Disconnect mains plug from electrical outlet

CATEGORY						
MES	EES	LSS	FES	PSS	WSS	MSS
 MES007 (ISO 7010-E019) Turn clockwise to open	 EES007 (ISO 7010-E028) Oxygen resuscitator	 LSS007 (ISO 7010-E042) Lifebuoy with light	 FES007 (ISO 7010-F010) Portable foam applicator unit	 PSS007 (ISO 7010-P007) No access for people with active implanted cardiac devices	 WSS007 (ISO 7010-W007) Warning; Floor level obstacle	 MSS007 (ISO 7010-M007) Opaque eye protection must be worn
 MES008 (ISO 7010-E057) Door opens by pulling on left-hand side	 EES008 (ISO 7010-E029) Emergency escape breathing device	 LSS008 (ISO 7010-E043) Lifebuoy with line & light	 FES008 (ISO 7010-F011) Water fog applicator	 PSS008 (ISO 7010-P008) No metallic articles or watches	 WSS008 (ISO 7010-W008) Warning; Drop (fall)	 MSS008 (ISO 7010-M008) Wear safety footwear
 MES009 (ISO 7010-E058) Door opens by pulling on the right-hand side	 EES009 (ISO 7010-E009) Doctor	 LSS008.1 Lifebuoy with light and smoke	 FES009 (ISO 7010-F012) Fixed fire extinguishing installation	 PSS009 (ISO 7010-P010) Do not touch	 WSS009 (ISO 7010-W009) Warning; Biological hazard	 MSS009 (ISO 7010-M009) Wear protective gloves

CATEGORY						
MES	EES	LSS	FES	PSS	WSS	MSS
 MES 010 (ISO 7010-E023) Push door on the right-hand side to open	 EES010 (ISO 7010-E010) Automated external heart defibrillator	 LSS009 (ISO 7010-E044) Lifejacket	 FES010 (ISO 7010-F013) Fixed fire extinguishing bottle	 PSS010 (ISO 7010-P011) Do not extinguish with water	 WSS010 (ISO 7010-W010) Warning; Low temperature	 MSS010 (ISO 7010-M010) Wear protective clothing
 Push door on the left-hand side to open	 EES011 Safety Equipment	 LSS010 (ISO 7010-E045) Child's lifejacket	 FES011 (ISO 7010-F014) Remote release station	 PSS011 (ISO 7010-P013) No activated mobile phones	 WSS011 (ISO 7010-W011) Warning; Slippery surface	 MSS011 (ISO 7010-M011) Wash your hands
	 EES012 (ISO 7010-E031) Shipboard general alarm	 LSS011 (ISO 7010-E046) Infant's lifejacket	 FES012 (ISO 7010-F015) Fire monitor	 PSS012 (ISO 7010-P014) No access for people with metallic implants	 WSS012 (ISO 7010-W012) Warning; Electricity	 MSS012 (ISO 7010-M012) Use handrail
	 EES013 (ISO 7010-E008) Break to obtain access	 LSS012 (ISO 7010-E047) Search and rescue transponder		 PSS013 (ISO 7010-P015) No reaching in	 WSS013 (ISO 7010-W013) Warning; Guard dog	 MSS013 (ISO 7010-M013) Wear a face shield

CATEGORY						
MES	EES	LSS	FES	PSS	WSS	MSS
		 LSS013 (ISO 7010-E048) Survival craft distress signal		 PSS014 (ISO 7010-P017) No pushing	 WSS014 (ISO 7010-W014) Warning; Forklift trucks and other industrial vehicles	 MSS014 (ISO 7010-M014) Wear head protection
		 LSS014 (ISO 7010-E049) Rocket parachute flare		 PSS015 (ISO 7010-P018) No sitting	 WSS015 (ISO 7010-W015) Warning; Overhead load	 MSS015 (ISO 7010-M015) Wear high visibility clothing
		 LSS015 (ISO 7010-E050) Line-throwing appliance		 PSS016 (ISO 7010-P019) No stepping on surface	 WSS016 (ISO 7010-W016) Warning; Toxic material	 MSS016 (ISO 7010-M016) Wear a mask
		 LSS016 (ISO 7010-E051) Two-way VHF radio-telephone apparatus		 PSS017 (ISO 7010-P020) Do not use lift in the event of fire	 WSS017 (ISO 7010-W017) Warning; Hot surface	 MSS017 (ISO 7010-M017) Wear respiratory protection

CATEGORY						
MES	EES	LSS	FES	PSS	WSS	MSS
		 LSS017 (ISO 7010-E052) Emergency position indicating radio beacon		 PSS018 (ISO 7010-P021) No dogs	 WSS018 (ISO 7010-W018) Warning; Automatic start-up	 MSS018 (ISO 7010-M018) Wear a safety harness
		 LSS018 (ISO 7010-E053) Embarkation ladder		 PSS019 (ISO 7010-P022) No eating or drinking	 WSS019 (ISO 7010-W019) Warning; Crushing	 MSS019 (ISO 7010-M019) Wear a welding mask
		 LSS019 (ISO 7010-E054) Marine evacuation slide		 PSS020 (ISO 7010-P023) Do not obstruct	 WSS020 (ISO 7010-W020) Warning; Overhead obstacle	
		 LSS020 (ISO 7010-E055) Marine evacuation chute		 PSS021 (ISO 7010-P024) Do not walk or stand here		

CATEGORY						
MES	EES	LSS	FES	PSS	WSS	MSS
		 LSS021 (ISO 7010-E056) Survival clothing			 WSS021 (ISO 7010-W021) Warning; Flammable material	
		 LSS022 (ISO 7010-E035) Liferaft Knife			 WSS022 (ISO 7010-W022) Warning; Sharp element	

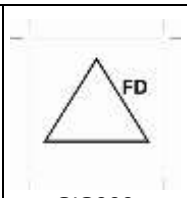
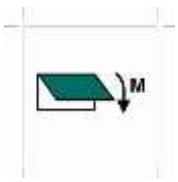
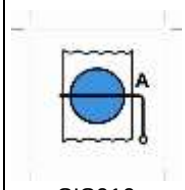
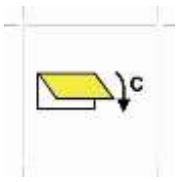
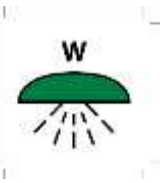
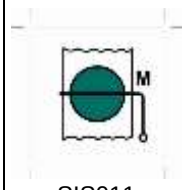
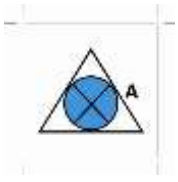
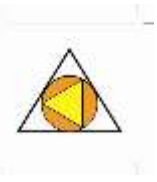
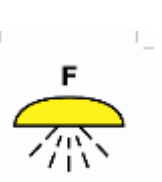
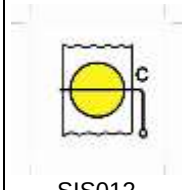
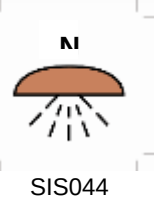
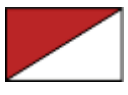
3.3 Signs in table 2 may be displayed together to form a sequence of critical mandatory actions to safely launch a lifeboat, rescue boat, or liferaft.

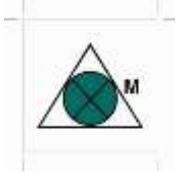
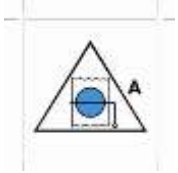
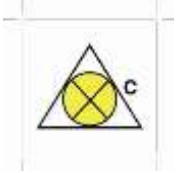
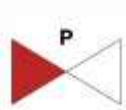
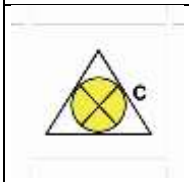
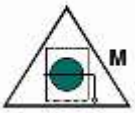
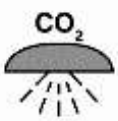
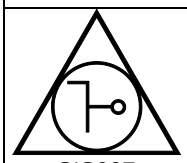
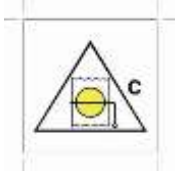
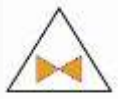
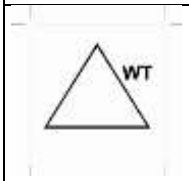
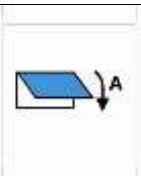
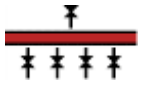
Table 2 — Summary of mandatory action signs for launching lifesaving equipment

 MSS022 (ISO 7010-M020) Fasten safety belts	 MSS023 (ISO 7010-M037) Close and secure hatches in launch sequence	 MSS024 (ISO 7010-M038) Start engine in launch sequence	 MSS025 (ISO 7010-M039) Lower lifeboat to the water in launch sequence	 MSS026 (ISO 7010-M040) Lower liferaft to the water in launch sequence
 MSS027 (ISO 7010- M041) Lower rescue boat to the water in launch sequence	 MSS028 (ISO 7010- M042) Release falls in launch sequence	 MSS029 (ISO 7010- M043) Start water spray in launch sequence	 MSS030 (ISO 7010- M044) Start air supply in launch sequence	 MSS031 (ISO 7010-M045) Release lifeboat gripes in launch sequence

3.4 Table 3 summarizes the SIS catalogue primarily adapted from resolution A.952(23) and standard ISO 17631 with the exception of the SIS signs listed in paragraph 3.1. Table 3 summarizes the standardized shipboard fire control plan signs used in workplaces and public areas to assist trained persons in the operation and management of shipboard fire control systems. The standardized symbols used in these signs are in accordance with the symbols found in the standard ISO 17631.

Table 3 — Summary of shipboard fire control plan signs (SIS) for shipboard use

 SIS001 Fire control plan	 SIS009 Remote control for fire doors	 SIS017 Closing device for ventilation inlet or outlet (machinery)	 SIS025 Emergency fire pump	 SIS033 International shore connection	 SIS041 Inert gas installation	 SIS049 Emergency source of electrical power (battery)
 SIS002 Safety plan	 SIS010 Fire damper (accommodation and service spaces)	 SIS018 Closing device for ventilation inlet or outlet (cargo spaces)	 SIS026 Fuel pump(s) remote shut-off	 SIS034 Fire hydrant	 SIS042 Space or group of spaces protected by a water fire-extinguishing system	 SIS050 Emergency switchboard
 SIS003 Fire and safety plan	 SIS011 Fire damper (machinery space)	 SIS019 Remote control for closing device for ventilation inlet and outlet (accomm)	 SIS027 Lube oil pump(s) remote shut-off	 SIS035 Main section valve	 SIS043 Space or group of spaces protected by a foam fire-extinguishing system	 SIS051 Air compressor for breathing devices
 SIS004 Ventilation remote control or shut-off (accommodation and service spaces)	 SIS012 Fire damper (cargo space)	 SIS020 Remote control for closing device for ventilation inlet and outlet (machinery)	 SIS028 Remote control for bilge pump(s)	 SIS036 Sprinkler-section valve	 SIS044 Space or group of spaces protected by a gas other than CO_2 fire-extinguishing system	 SIS052 Control panel for fire detection and alarm system

 SIS005 Ventilation remote control or shut-off (machinery spaces)	 SIS013 Remote control for fire damper (accommodation or service spaces)	 SIS021 Remote control for closing device for ventilation inlet and outlet (cargo)	 SIS029 Remote control for emergency bilge pump	 SIS037 Powder-section valve	 SIS045 Space or group of spaces protected by a powder fire-extinguishing system	
 SIS006 Ventilation remote control or shut-off (cargo)	 SIS014 Remote control for fire damper (machinery)	 SIS022 Remote control for fire pump	 SIS030 Remote control for fuel oil valves	 SIS038 Foam-section valve	 SIS046 Space or group of spaces protected by a CO_2 fire-extinguishing system	
 SIS007 Remote control for skylight	 SIS015 Remote control for fire damper (cargo space)	 SIS023 Fire pump	 SIS031 Remote control for lube oil valves	 SIS039 High expansion foam supply trunk (outlet)	 SIS047 Space or group of spaces protected by a sprinkler or high-pressure water fire-extinguishing system	
 SIS008 Remote control for watertight doors	 SIS016 Closing device for ventilation inlet or outlet (accommodation and service spaces)	 SIS024 emergency fire pump Remote control or fire pump supplied by the emergency source of power	 SIS032 Remote control for fire pump valves	 SIS040 Water spray system valves 2.24	 SIS048 Emergency generator	

***

ANNEX 25

DRAFT AMENDMENTS* TO THE INTERNATIONAL CODE FOR APPLICATION OF FIRE TEST PROCEDURES, 2010 (2010 FTP CODE)

ANNEX 3 – TABLE 1

1 The heading of table 1 is replaced with the following:

"**Table 1 – Fire protection materials and required approval test methods for passenger ships ~~carrying more than 36 passengers~~ and high-speed craft**"

2 In table 1, in the last column "Applicable regulation SOLAS chapter II-2 and HSC Code" and rows one to eight, references "9.2.2.4" and "9.2.2.4.3" are added as follows:

"

Test method (FTP Code) / Specimen (Products)				**Applicable regulation SOLAS chapter II-2 and HSC Code**
"A" class bulkhead				3.2.3, 9.2.2.3, 9.2.2.4
"B" class bulkhead				3.4.1, 9.2.2.3, 9.2.2.4
"C" class bulkhead				3.10, 9.2.2.3, 9.2.2.4
"A" class deck				3.2.3, 9.2.2.3, 9.2.2.4
"B" class deck				3.4.1, 9.2.2.3, 9.2.2.4
"B" class lining				3.4.1, 9.2.2.3, 9.2.2.4
"B" class ceilings				3.4.1, 9.2.2.3, 9.2.2.4
"B" class continuous ceilings				3.4.1, 9.2.2.3.3, 9.2.2.4.3

"

3 In table 1, in the intersection of column "Applicable regulation SOLAS chapter II-2 and HSC Code" and row "Partial bulkheads", reference "5.3.1.2.1" is replaced by reference"5.3.1.3.1".

4 In table 1, in the intersection of column "Applicable regulation SOLAS chapter II-2 and HSC Code" and row "Fire Door Control System", reference "9.4.1.1.4.15" is replaced by reference "9.4.1.1.5.15".

***

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX 27

DRAFT MSC-MEPC.5 CIRCULAR

GUIDANCE ON COMPLETING THE CERTIFICATE OF FITNESS UNDER THE IBC, BCH, IGC, GC AND EGC CODES

1 The Maritime Safety Committee, at its ninety-eighth session (7 to 16 June 2017), and the Marine Environment Protection Committee, [at its seventy-first session (3 to 7 July 2017)], approved the annexed *Guidance on completing the Certificate of Fitness under the IBC, BCH, IGC, GC and EGC Codes* ("the Guidance").

2 Member States are invited to bring the Guidance to the attention of all parties concerned, in particular, those who are involved in the process of issuance, maintenance, endorsement and revision of certificates, such as recognized organizations, port State control officers, shipowners and crew, agents and vetting companies.

ANNEX

GUIDANCE ON COMPLETING THE CERTIFICATE OF FITNESS UNDER THE IBC, BCH, IGC, GC AND EGC CODES

Introduction

1 The Marine Environment Protection Committee (MEPC), at its sixty-sixth session (31 March to 4 April 2014), adopted amendments to MARPOL Annex I, the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) and the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code) by resolutions MEPC.248(66), MEPC.250(66) and MEPC.249(66), respectively. The aforementioned amendments introduced, inter alia, changes to the Form of IOPP Certificate and Supplements, the Model form of International Certificate of Fitness of the Carriage of Dangerous Chemicals in Bulk and the Model form of Certificate of Fitness for the Carriage of Dangerous Chemicals in bulk, to reflect the requirements for a stability instrument capable of verifying compliance with intact and damage stability requirements.

2 The Maritime Safety Committee, at its ninety-third session (14 to 23 May 2014), adopted the same amendments to the IBC and BCH Codes as above (see resolutions MSC.369(93) and MSC.376(93), respectively), together with corresponding amendments to the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (GC Code) and the Code for Existing Ships Carrying Liquefied Gases in Bulk (EGC Code) (see resolutions MSC.370(93) and MSC.377(93) and annex 13 to document MSC 93/22/Add.1, respectively)

Requirement for loading and stability information manual/booklet

3 The requirement for a ship to be supplied with an approved loading and stability information manual/booklet* also holds when the ship has been fitted with an approved stability instrument.

Certificates issued to ships that need not yet comply with the requirement to be fitted with an approved stability instrument.

4 There are circumstances in which a ship constructed before 1 January 2016 may need to have its Certificate of Fitness reissued on or after 1 January 2016 but before 1 January 2021 and before the ship's first scheduled renewal survey in the aforementioned 5-year period (e.g. at a change of flag or when the cargoes to be carried are changed). Given that the date of compliance with the requirement for having been fitted with an approved stability instrument will not have been reached yet for that particular ship, the ship may not be fitted with an approved stability instrument. Consequently, the Certificate of Fitness under the IBC, BCH, IGC, GC and EGC Codes, as applicable, should be issued with certain lines struck through, as shown below, in addition to striking through the options that do not apply (taking into account that Notes could be added to the certificate to facilitate clarification):

* As required by regulation 28.5 of MARPOL Annex I, paragraph 2.2.5 of the IBC Code, paragraph 2.2.1 of the BCH Code, paragraph 2.2.5 of the IGC Code, paragraph 2.2.3 of the GC Code and paragraph 2.2 of the EGC Code, as applicable.

"... That the ship must be loaded:

.1* ~~only in accordance with loading conditions verified compliant with intact and damage stability requirements using the approved stability instrument fitted in accordance with paragraph 2.2.6 of the Code;~~

.2* ~~where a waiver permitted by paragraph 2.2.7 of the Code is granted and the approved stability instrument required by paragraph 2.2.6 of the Code is not fitted, loading shall be made~~ in accordance with one or more of the following approved methods:

(i) * in accordance with the loading conditions provided in the approved loading manual, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration; or

~~(ii) * in accordance with loading conditions verified remotely using an approved means ……; or~~

(iii) * in accordance with a loading condition which lies within an approved range of conditions defined in the approved loading manual referred to in (i) above; or

(iv) * in accordance with a loading condition verified using approved critical KG/GM data defined in the approved loading manual referred to in (i) above;

.3* in accordance with the loading limitations appended to this Certificate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions shall be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition**."

---

* Delete as appropriate

** Instead of being incorporated in the Certificate, this text may be appended to the Certificate, if duly signed and stamped."

References to amending resolutions

5 For gas carriers to which the IGC Code applies and for chemical tankers to which the IBC Code applies, the Certificate of Fitness must refer to all the resolutions by which amendments to the Codes were adopted and with which the ship fully complies. The three sub-paragraphs below contain recommendations on how the relevant resolutions can be comprehensively referenced in the Certificate of Fitness without explicitly listing all of the resolutions:

.1 for chemical tankers to which the IBC Code applies: by stating "All up to and including [the latest resolution]", where "[the latest resolution]" is replaced with the identifier of the applicable resolution;

.2 for gas carriers to which the IGC Code applies that comply with resolution MSC.5(48), as amended by resolutions MSC.17(58), MSC.30(61), MSC.32(63), MSC.59(67), MSC.103(73), MSC.177(79) and MSC.220(82) and with the stability instruments provisions provided in

resolution MSC.370(93): by stating "All applicable requirements contained in resolutions up to and including resolution MSC.220(82) and the requirements in paragraph 2.2.6 or 2.2.7 of the IGC Code, as amended by resolution MSC.370(93)"; and

.3 for gas carriers to which the IGC Code applies that comply voluntarily with all the requirements of the IGC Code, as amended by resolution MSC.370(93): by only stating "resolution MSC.370(93)", since the voluntary compliance can be identified by the keel-laying date on the certificate.

***

ANNEX 28

DRAFT AMENDMENTS* TO THE INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (IBC CODE)

1 In the appendix, the existing paragraph 6 of the model form of International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk is replaced with the following:

"6 That the loading and stability information booklet required by paragraph 2.2.5 of the Code has been supplied to the ship in an approved form.

7~~6~~ That the ship must be loaded:

.1* only in accordance with loading conditions verified compliant with intact and damage stability requirements using the approved stability instrument fitted in accordance with paragraph 2.2.6 of the Code;

.2* where a waiver permitted by paragraph 2.2.7 of the Code is granted and the approved stability instrument required by paragraph 2.2.6 of the Code is not fitted, loading shall be made in accordance with one or more of the following approved methods:

(i) * in accordance with the loading conditions provided in the approved loading and stability information booklet ~~manual~~ referred to in 6 above~~, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration~~; or

(ii) * in accordance with loading conditions verified remotely using an approved means……; or

(iii) * in accordance with a loading condition which lies within an approved range of conditions defined in the approved loading and stability information booklet ~~manual~~ referred to in 6~~(i)~~ above; or

(iv) * in accordance with a loading condition verified using approved critical KG/GM data defined in the approved loading and stability information booklet ~~manual~~ referred to in 6~~(i)~~ above;

.3* in accordance with the loading limitations appended to this Certificate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions shall be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition.**

* Delete as appropriate

** Instead of being incorporated in the Certificate, this text may be appended to the Certificate, if duly signed and stamped."

***

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX 29

DRAFT AMENDMENTS* TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

1 In the appendix, the existing paragraph 6 of the model form of Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk is replaced with the following:

"6 That the loading and stability manuals required by paragraph 2.2.1.1 of the Code have been supplied to the ship in an approved form.

7~~6~~ That the ship must be loaded:

.1* only in accordance with loading conditions verified compliant with intact and damage stability requirements using the approved stability instrument fitted in accordance with paragraph 2.2.1.2 of the Code;

.2* where a waiver permitted by paragraph 2.2.1.3 of the Code is granted and the approved stability instrument required by paragraph 2.2.1.2 of the Code is not fitted, loading shall be made in accordance with one or more of the following approved methods:

(i) * in accordance with the loading conditions provided in the approved loading and stability manuals referred to in 6 above~~, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration~~; or

(ii) * in accordance with loading conditions verified remotely using an approved means ……..……; or

(iii) * in accordance with a loading condition which lies within an approved range of conditions defined in the approved loading and stability manuals referred to in 6~~(i)~~ above; or

(iv) * in accordance with a loading condition verified using approved critical KG/GM data defined in the approved loading and stability manuals referred to in 6~~(i)~~ above;

.3* in accordance with the loading limitations appended to this Certificate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions shall be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition.**

* Delete as appropriate.

** Instead of being incorporated in the Certificate, this text may be appended to the Certificate, if duly signed and stamped."

***

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX 30

DRAFT AMENDMENTS* TO THE INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK (IGC CODE)

1 In appendix 2, the existing paragraph 6 of the model form of International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk is replaced with the following:

"6 That the loading and stability information booklet required by paragraph 2.2.5 of the Code has been supplied to the ship in an approved form.

~~7~~6 That the ship must be loaded:

.1* only in accordance with loading conditions verified compliant with intact and damage stability requirements using the approved stability instrument fitted in accordance with paragraph 2.2.6 of the Code;

.2* where a dispensation permitted by paragraph 2.2.7 of the Code is granted and the approved stability instrument required by paragraph 2.2.6 of the Code is not fitted, loading shall be made in accordance with one or more of the following approved methods:

.i* in accordance with the loading conditions provided in the approved loading and stability information booklet ~~manual~~ referred to in 6 above~~, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration~~; or

.ii* in accordance with loading conditions verified remotely using an approved means……; or

.iii* in accordance with a loading condition which lies within an approved range of conditions defined in the approved loading and stability information booklet ~~manual~~ referred to in 6~~i~~ above; or

.iv* in accordance with a loading condition verified using approved critical KG/GM data defined in the approved loading and stability information booklet ~~manual~~ referred to in 6~~i~~ above;

.3* in accordance with the loading limitations appended to this Certificate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions should be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition.**

* Delete as appropriate.

** Instead of being incorporated in the Certificate, this text may be appended to the Certificate, if duly signed and stamped."

***

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX 31

DRAFT AMENDMENTS* TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING LIQUEFIED GASES IN BULK (GC CODE)

1 In the appendix, the existing paragraph 6 of the model form of Certificate of Fitness for the Carriage of Liquefied Gases in Bulk is replaced with the following:

"6 That the loading and stability information booklet required by paragraph 2.2.3 of the Code has been supplied to the ships in an approved form.

~~7~~6 That the ship must be loaded:

.1* only in accordance with loading conditions verified compliant with intact and damage stability requirements using the approved stability instrument fitted in accordance with paragraph 2.2.4 of the Code;

.2* where a waiver permitted by paragraph 2.2.5 of the Code is granted and the approved stability instrument required by paragraph 2.2.4 of the Code is not fitted, loading shall be made in accordance with one or more of the following approved methods:

(i)* in accordance with the loading conditions provided in the approved loading and stability information booklet ~~manual~~ referred to in 6 above~~, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration~~; or

(ii)* in accordance with loading conditions verified remotely using an approved means……; or

(iii)* in accordance with a loading condition which lies within an approved range of conditions defined in the approved loading and stability information booklet ~~manual~~ referred to in 6~~(i)~~ above; or

(iv)* in accordance with a loading condition verified using approved critical KG/GM data defined in the approved loading and stability information booklet ~~manual~~ referred to in 6~~(i)~~ above;

.3* in accordance with the loading limitations appended to this Certificate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions should be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition.

---

* Delete as appropriate.

** Instead of being incorporated in the Certificate, this text may be appended to the Certificate, if duly signed and stamped."

***

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX 32

DRAFT AMENDMENTS* TO THE CODE FOR EXISTING SHIPS CARRYING LIQUIFIED GASES IN BULK (EGC CODE)

1 In the appendix, the existing paragraph 6 of the model form of Certificate of Fitness for the Carriage of Liquefied Gases in Bulk is replaced with the following:

"6 That the loading and stability information booklet required by paragraph 2.2 of the Code has been supplied to the ship in an approved form.

~~7~~6 That the ship must be loaded:

.1* only in accordance with loading conditions verified compliant with intact and damage stability requirements using the approved stability instrument fitted in accordance with paragraph 2.3 of the Code;

.2* where a waiver permitted by paragraph 2.4 of the Code is granted and the approved stability instrument required by paragraph 2.3 of the Code is not fitted, loading shall be made in accordance with the following approved methods:

(i)* in accordance with the loading conditions provided in the approved loading and stability information booklet~~manual~~ referred to in 6 above~~, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration~~; or

(ii)* in accordance with loading conditions verified remotely using an approved means……; or

(iii)* in accordance with a loading condition which lies within an approved range of conditions defined in the approved loading and stability information booklet ~~manual~~ referred to in 6~~(i)~~ above; or

(iv)* in accordance with a loading condition verified using approved critical KG/GM data defined in the approved loading and stability information booklet ~~manual~~ referred to in 6~~(i)~~ above;

.3* in accordance with the loading limitations appended to this Certificate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions should be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition.**

* Delete as appropriate.

** Instead of being incorporated in the Certificate, this text may be appended to the Certificate, if duly signed and stamped."

***

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX 33

RULES OF PROCEDURE OF THE MARITIME SAFETY COMMITTEE

Membership

Rule 1

For the purpose of these Rules, the term "Member" means a Member of the Organization and "other Participant" means a State not a Member of the Organization but Party to a treaty or other international instrument in respect of which the Committee performs functions as provided therein. Membership of the Committee shall be open to all Members and other Participants.

Subsidiary bodies

Rule 2

1 The Committee may establish such subsidiary bodies as it considers necessary. Such subsidiary bodies shall follow these Rules, except for rules 3, 9, 14, 15 and 16.

2 Periodically the Committee shall examine the need for the continued existence of any subsidiary body.

Sessions

Rule 3

The Committee shall meet at least once a year in regular session and more frequently with the approval of the Council. The Committee may meet in an extraordinary session upon a request made in writing to the Secretary-General by at least twenty of its respective Members. Sessions of the Committee shall be held at the Headquarters of the Organization unless convened elsewhere in accordance with a decision of the Committee approved by the Assembly or the Council.

Rule 4

The Secretary-General, acting on the direction of the Chair, shall notify Members and other Participants at least two months in advance of the holding of a session of the Committee, and shall also notify the Chairs of other interested IMO bodies who shall have the option of attending sessions as observers.

Observers

Rule 5

1 The Secretary-General, with the approval of the Council, may invite States having made applications for membership, States which have signed but not accepted the Convention on the International Maritime Organization, and States which are Members of the United Nations or of any specialized agency and liberation movements recognized by the African Union or the League of Arab States to send observers to sessions of the Committee.

2 The Secretary-General shall invite to be represented as observer at each session of the Committee:

.1 the United Nations, including the United Nations Environment Programme; and

.2 any of the specialized agencies of the United Nations and the International Atomic Energy Agency.

3 The Secretary-General shall invite to be represented by observers at each session of the Committee at which matters of direct concern to them are on the agenda:

.1 other intergovernmental organizations with which an agreement or special arrangement has been made; and

.2 non-governmental international organizations with which the Organization has established relationships in accordance with the rules governing consultations with such organizations.

4 Upon invitation by the Chair and with the consent of the Committee concerned, such observers may participate without vote on matters of direct concern to them.

Rule 6

1 Representatives of the United Nations, the International Atomic Energy Agency and of the specialized agencies shall receive copies of all documents issued to the Committee, subject to any arrangements as may be necessary for the safeguarding of confidential material.

2 Observers shall have access to non-confidential documents and to such other documents as the Secretary-General, with the approval of the Chair, may decide to make available.

Delegations and credentials

Rule 7

Each Member or other Participant shall designate a representative and such alternates, advisers and experts as may be required.

Rule 8

Each Member or other Participant shall notify the Secretary-General in writing as soon as possible and in any case not later than the opening day of a session of the composition of its delegation to that session.

Rule 9

1 Each Member or Government entitled to participate in a session of the Committee shall transmit to the Secretary-General the credentials of its representatives and alternates, if any. The credentials shall be issued by the Head of State, Head of Government, Minister for Foreign Affairs, Minister concerned or by an appropriate authority properly designated by one of them for this purpose. The Secretary-General shall examine the credentials of each representative and alternate and report to the Committee thereon without delay.

2 All representatives shall be seated provisionally with the same rights until the Secretary-General has reported on credentials and the Committee has given its decision.

Publicity

Rule 10

1 The Committee may decide to hold meetings in private or public. In the absence of a decision to hold meetings in public, they shall be held in private.

2 Notwithstanding the aforesaid, and in accordance with the *Guidelines for media access to meetings of Committees and their subsidiary bodies* approved by the Council, media may attend meetings of the Committee unless the Committee decides otherwise. Meetings of working and drafting groups established by the Committee shall be held in private.

Agenda

Rule 11

The provisional agenda for each session of the Committee shall be prepared by the Secretary-General and approved by the Chair; and shall normally be communicated with the basic supporting documents to the Members and other Participants two months before the opening of a session.

Rule 12

The first item on the provisional agenda for each session shall be the adoption of the agenda.

Rule 13

Subject to the provisions of rule 14, any item of the agenda of a session of the Committee, consideration of which has not been completed at that session, shall be included in the agenda of a subsequent session unless otherwise decided by the Committee.

Rule 14

The provisional agenda for each session of the Committee shall include:

.1 all items the inclusion of which has been requested by the Assembly or the Council;

.2 all items the inclusion of which has been requested by the Committee at a previous session;

.3 any item proposed by a Member;

.4 subject to the provisions of a treaty or other international agreement in respect of which the Committee performs functions, any amendment proposed by a Party to that treaty or other international agreement;

.5 subject to such preliminary consultations as may be necessary, any item proposed by any other subsidiary body of the Organization, by the United Nations or by any of its specialized agencies, or by the International Atomic Energy Agency; and

.6 any item proposed by the Secretary-General.

Rule 15

The Secretary-General shall report on the technical, administrative and financial implications of any substantive agenda items submitted to the Committee and, unless the Committee decides otherwise, no such item shall be considered until the Secretary-General's report has been available to the Committee for at least 24 hours.

Rule 16

In circumstances of urgency the Secretary-General, with the approval of the Chair, may include any question suitable for the agenda which may arise between the dispatch of the provisional agenda and the opening day of the session in a supplementary provisional agenda which the Committee shall examine together with the provisional agenda. The Secretary-General shall advise Members and other Participants immediately of the intention to include an item in a supplementary provisional agenda.

Rule 17

Unless it determines otherwise, the Committee shall not proceed to the discussion of any item on the agenda until at least 24 hours have elapsed after the relevant documents have been made available to Members and other Participants.

Chair and Vice-Chair

Rule 18

1 The Committee shall elect from among its Members a Chair and a Vice-Chair who shall each hold office for a term of one calendar year. They shall both be eligible for re-election for up to four further consecutive terms of office. In exceptional circumstances they may be re-elected for one additional consecutive term of office.

2 The Chair, or the Vice-Chair acting as Chair, shall not vote.

3 The Chair and Vice-Chair shall be elected at the end of the last regular session in each calendar year and shall assume their functions at the beginning of the following calendar year.

Rule 19

If the Chair is absent from a session, or any part thereof, the Vice-Chair shall preside. If the Chair, for any reason, is unable to complete the term of office, the Vice-Chair shall act as Chair pending the election of a new Chair.

Secretariat

Rule 20

The Secretary-General shall act as Secretary of the Committee. This function may be delegated to a member of the Secretariat.

Rule 21

The Secretary-General, or any member of the Secretariat designated for the purpose, may make either oral or written statements concerning any question under consideration.

Rule 22

It shall be the duty of the Secretariat to receive, translate and circulate to Members and other Participants all reports, resolutions, recommendations and other documents of the Committee.

Languages

Rule 23

The official languages of the Committee are Arabic, Chinese, English, French, Russian and Spanish; the working languages are English, French and Spanish.

Rule 24

Speeches at the Committee shall be made in one of the official languages and shall be interpreted into the other five official languages.

Rule 25

1 All supporting documents to agenda items of the Committee shall be issued in the working languages.

2 All reports, resolutions, recommendations and decisions of the Committee shall be drawn up in one of the official languages and translated into the other five official languages.

Voting

Rule 26

1 When considering matters not connected with functions performed by the Committee in respect of treaties or other international agreements, all Members and other Participants may participate, but only Members of the Organization shall be entitled to vote.

2 Each Member entitled to vote shall have one vote.

3 When the Committee performs functions as provided for in a treaty or other international agreement, all Members and other Participants shall be entitled to participate in the proceedings, but voting on amendments to the treaty or other agreement shall be in accordance with the provisions of that treaty or agreement.

Rule 27

Subject to the provisions of any treaty or other international agreement which confers upon the Organization functions to be undertaken by the Committee, decisions of the Committee shall be made and reports, resolutions and recommendations adopted by a majority of the Members or other Participants entitled to vote, present and voting.

Rule 28

1 For the purpose of these Rules, the phrase "Members or other Participants entitled to vote, present and voting" means such Members or other Participants entitled to vote, casting an affirmative or negative vote. Those abstaining from voting or casting an invalid vote shall be considered as not voting. The phrase "Members present" means Members at the meeting, whether they cast an affirmative or negative vote, whether they abstain, whether they cast an invalid vote or whether they take no part in the voting.

2 The provisions in rule 28.1 above shall apply only if the quorum laid down in rule 34 is obtained at the meeting at which the vote is taken.

3 Participants in the session who are not present at the meeting at which voting takes place shall be considered as not present.

Rule 29

The Committee shall normally vote by show of hands. However, any Member or other Participant entitled to vote may request a roll-call which shall be taken in the alphabetical order of the names of the Members in English, beginning with the Member whose name is drawn by lot by the Chair. The vote of each Member or other Participant in any roll-call shall be inserted in the report of the session concerned.

Rule 30

If a vote is equally divided, a second vote shall be taken at the next meeting. If this vote is equally divided, the proposal shall be regarded as rejected.

Elections

Rule 31

Officers of the Committee shall be elected by secret ballot, unless the Committee decides otherwise.

Rule 32

In a secret ballot two scrutineers shall, on the proposal of the Chair, be appointed by the Committee from the delegations present and shall proceed to scrutinize the votes cast. All invalid votes cast shall be reported to the Committee.

Rule 33

If one person only is to be elected and no candidate obtains a majority in the first ballot, a second ballot shall be taken confined normally to the two candidates obtaining the largest number of votes. If in the second ballot the votes are equally divided, the election shall be deferred until the ensuing session, when, if another tie results, the Chair shall decide between the candidates by drawing lots.

Conduct of business

Rule 34

1 The Chair may declare a meeting open and permit the debate to proceed when at least 25% of the Membership of the Organization are present. The presence of at least 25% of the Membership of the Organization, or other participants, as appropriate, shall be required for any decision to be taken.

2 When a treaty or other international instrument in respect of which the Committee performs functions contains a provision relating to the quorum, such provision shall apply in respect of such functions.

Rule 35

In addition to exercising the powers conferred elsewhere by these Rules, the Chair shall declare the opening and closing of each session of the Committee; direct the discussion and ensure observance of these Rules; accord the right to speak; put questions to the vote; and announce decisions resulting from the voting.

Rule 36

Proposals and amendments shall normally be introduced in writing and handed to the Secretary-General who shall circulate copies to delegations. As a general rule, no proposal shall be discussed or put to the vote at any meeting of the Committee unless copies of it have been circulated to delegations not later than the day preceding the meeting. The Chair may, however, permit the discussion and consideration of amendments or of motions as to procedure even though these amendments and motions have not been circulated or have only been circulated the same day.

Rule 37

The Committee may, on proposal of the Chair, limit the time to be allowed to each speaker on any particular subject under discussion.

Rule 38

1 During the discussion of any matter a Member or other Participant may rise to a point of order and the point of order shall be decided immediately by the Chair, in accordance with these Rules. A Member or other Participant may appeal against the ruling of the Chair. The appeal shall be put to the vote immediately and the Chair's ruling shall stand unless overruled by a majority of the Members or other Participants present and voting.

2 A Member rising to a point of order may not speak on the substance of the matter under discussion.

Rule 39

1 Subject to the provisions of rule 38 the following motions shall have precedence, in the order indicated below, over all other proposals or motions before the meeting:

.1 to suspend a meeting;

.2 to adjourn a meeting;

.3 to adjourn the debate on the question under discussion; and

.4 for the closure of the debate on the question under discussion.

2 Permission to speak on a motion falling within rule 39.1 above shall be granted only to the proposer and in addition to one speaker in favour of and two against the motion, after which it shall be put immediately to the vote.

Rule 40

If two or more proposals relate to the same question, the Committee, unless it decides otherwise, shall vote on the proposals in the order in which they have been submitted.

Rule 41

Parts of a proposal or amendment thereto shall be voted on separately if the Chair, with the consent of the proposer, so decides, or if any Member or other Participant requests that the proposal or amendment thereto be divided and the proposer raises no objection. If objection is raised, permission to speak on the point shall be given first to the mover of the motion to divide the proposal or amendment, and then to the mover of the original proposal or amendment under discussion, after which the motion to divide the proposal or amendment shall be put immediately to the vote.

Rule 42

Those parts of a proposal which have been approved shall then be put to the vote as a whole; if all the operative parts of the proposal or amendment have been rejected, the proposal or amendment shall be considered to be rejected as a whole.

Rule 43

A motion is considered to be an amendment to a proposal if it merely adds to, deletes from or revises part of that proposal. An amendment shall be voted on before the proposal to which it relates is put to the vote, and if the amendment is adopted, the amended proposal shall then be voted on.

Rule 44

If two or more amendments are moved to a proposal, the Committee shall first vote on the amendment furthest removed in substance from the original proposal and then on the amendment next furthest removed therefrom and so on, until all amendments have been put to the vote. The Chair shall determine the order of voting on the amendments under this Rule.

Rule 45

A motion may be withdrawn by its proposer at any time before voting on it has begun, provided that the motion has not been amended or that an amendment to it is not under discussion. A motion withdrawn may be reintroduced by any Member or other Participant having the right to submit such a motion.

Rule 46

When a proposal has been adopted or rejected, it may not be reconsidered at the same session of the Committee unless the Committee, by a majority of the Members or other Participants present and voting, decides in favour of reconsideration. Permission to speak on a motion to reconsider shall be accorded only to the mover and one other supporter and to two speakers opposing the motion, after which it shall be put immediately to the vote.

Invitation of experts

Rule 47

The Committee may invite any person whose expertise it may consider useful for its work to participate in a meeting. A person invited under this Rule shall not have the right to vote.

Amendments to Rules of Procedure

Rule 48

These Rules may be amended by a decision of the Committee, taken by a majority of the Members present and voting.

Suspension of Rules of Procedure

Rule 49

A Rule may be suspended by a decision of the Committee taken by a majority of the Members present and voting, provided that 24 hours' notice of the proposal for suspension has been given. This notice may be waived if no Member objects.

Overriding authority of IMO Convention

Rule 50

In the event of any conflict between a provision of these Rules and a provision of the Convention, the Convention shall prevail.

***

ANNEX 39

STATEMENTS BY DELEGATIONS AND OBSERVERS*

AGENDA ITEM 1

Statement by the delegation of the Marshall Islands

"On 31 March 2017, the Marshall Islands registered Very Large Ore Carrier **Stellar Daisy**, with a crew of 24, sank in the South Atlantic. After an emergency distress signal was sent from the EPIRB of the **Stellar Daisy**, an intensive search and rescue operation was initiated. This effort was coordinated by Maritime Rescue Coordination Centre Uruguay. Military aircraft and vessels, and commercial vessels were involved in the search for the **Stellar Daisy** and crew. Regrettably only two crewmembers were rescued, and the SAR operations were concluded on 9 May.

The Republic of the Marshall Islands Maritime Administrator expresses its deepest condolences to the families of the missing 22 crew members of the **Stellar Daisy** and its sincere thanks to all those involved in the search and rescue operation.

Following the notification of the distress and subsequent sinking of the **Stellar Daisy**, the Administrator initiated an immediate investigation into this very serious casualty. Both the South Korean and Philippine Governments are substantially interested States to the investigation and are in an active dialogue with the Administrator.

The **Stellar Daisy** was formerly a Very Large Crude Carrier, which was converted to a Very Large Ore Carrier in 2009. There are an additional 12 similarly converted VLCCs flagged by the Marshall Islands. As a matter of course, the Administrator is performing marine safety inspections on all converted VLOCs registered in the Marshall Islands. These inspections are in coordination and conjunction with the Korean Register of Shipping and are being conducted by two Marshall Islands inspection teams. To date, nine vessels have been inspected with a further three inspections to be scheduled in the coming weeks.

A team of Marshall Islands investigators, including two maritime consultants, are currently conducting an in-depth investigation as to the cause of the loss of the **Stellar Daisy**. The investigation team has already interviewed the two surviving crewmembers and is currently undertaking a detailed analysis of the inspection results thus far.

The Administrator is committed to conducting a thorough investigation of the **Stellar Daisy** sinking and resulting loss of life and the sharing of lessons learned in support of casualty prevention and promoting safety of life and prevention of pollution. This investigation is the Administrator's top priority and a full report will be issued in due course."

* Statements have been included in this annex in the order in which they are listed in the report, sorted by agenda items, and in the language of submission (including translation into any other language if such translation was provided).

AGENDA ITEM 4

Statement by the delegation of the Russian Federation

"In our opinion, the legal issue of voluntary early implementation has not been resolved.

The use of such lever of the voluntary nature as the MSC circular inviting on voluntary early implementation to Contracting Governments is recommendatory on its status and therefore has no particular impact on PSC whether it's achieved through the issue of additional circulars or through GISIS.

The mention in paragraph 3.4 of the Guidelines the State's right for equivalents (SOLAS I/5) is the only correct from the legal point of view and shall be appointed as the measure that the Contracting Governments not only "may also consider the use" but "should use" when deciding on voluntary early implementation to cover the interim period between the date of voluntary early implementation and the date of entry into force of the amendments.

It is our concern that the action recommended to the PSC officer, such as "should take into account" in paragraph 4.2 of the Guidelines, will not have any significant importance in case of deficiency or detention of the vessel due to the fact that it is ambiguous and does not carry clear instructions for action.

In connection with the above concerns we consider the amendment of res. A.1052(27) as inappropriate and oppose its endorsement."

"По нашему мнению, правовой вопрос добровольной ранней имплементации не решен.

Использование рычагов добровольного характера, а именно призывающего циркуляра в адрес государств-сторон от лица КБМ к добровольной ранней имплементации является рекомендательным по статусу, а значит, не имеющим особого влияния на PSC как бы он не был извещен – путем издания дополнительных циркуляров или через GISIS.

Упоминание в параграфе 3.4 Руководства единственного верного, с правовой точки зрения, - права государства на эквиваленты (пр. I/5 СОЛАС) считаем мерой, которой государство не только может, а ему следует (should) воспользоваться при решении вопроса добровольной ранней имплементации для покрытия периода между датой добровольной ранней имплементации и датой вступления в силу поправок.

Вызывает опасение, что рекомендуемое инспектору действие, такое как упомянутое в параграфе 4.2 Руководства- “should take into account” не будет иметь особого значения в случае выставления замечаний или задержания судна, поскольку неоднозначно и не несет в себе четких руководств к действию.

В связи с вышеперечисленными опасениями, считаем внесение поправок в Res.A.1052(27) нецелесообразным и выступаем против их внесения."

AGENDA ITEM 6

Statement by the delegation of Greece

"We would like to thank the last GBS audit team, IMO Secretariat, IACS and its members for all their efforts so far.

Greece has some comments for the non-conformities mentioned in MSC 98/6/1, but before this please allow us a word about the audit identified observations.

We recall that the committee has requested IACS and ROs to address the identified observations as well, taking into account the recommendations made by the audit teams together with comments in document MSC 96/5/9 by Greece (MSC 96/25, Report of MSC 96, paragraph 5.8.4) and that the outcome should be submitted in the future. In this context we have noted for example in rectifying NC 01 that the equivalent design waves used are based on the wave data included in Recommendation No.034 which is under review as a consequence of OB 02 and OB 04. This means that for the time being the corrective action for NC 01 may be considered as adequate so far, but it has to be revisited by the completion of the relevant Observations. This may be the case for other non-conformities as well.

We further note that, for a number of Observations, some auditors felt that they are of sufficient importance to categorize them as non-conformities. Thus while fully understanding IACS priority to deal with the non-conformities, we hope that all identified Observations are also in the process of being swiftly addressed as a first priority issue and hopefully well before any other new rule changes are introduced to harmonized CSR.

Coming to the non-conformities our first comment relates to NC 02 (safety factors). We note in paragraph 4.2.4 of document MSC 98/6/1 that the auditors were not fully satisfied mentioning that the principle used in the current rules would need to be replaced , in the longer term, by rule effectiveness monitoring based on surveys and follow-up of structural failures.

Mr. Chair, the fact is that the current rules in general do not feature explicit safety factors. In this context the reactive approach adopted by the last audit team to close this non-conformity is adequate, for the time being. We would however, urge IACS to continue working toward that goal in future rule revisions and minimize the uncertainty of loads, loading conditions etc. assumed for bulkers and tankers by introducing proactive approaches that are applied to other cargo ship categories, for example full finite element (FE) analysis of the entire ship's structure of containerships, LNG carriers etc.

Our next comment refers to NC 03 which we feel is also very important. Here the auditors had identified that for ships less than 200m length, the percentage of operation in light and heavy ballast condition assumed by the rules was not appropriate. The auditors were of the view that a much higher portion of operation under heavy ballast conditions was appropriate, especially when considering North Atlantic operation. This is important since the assumed conditions determine the fatigue strength of the ship. For a reason which is not clear to us, the auditors made their comment for ships of light carrying capacity BC-B and BC-C only. However the same observation is valid and more so, for the standard bulk carriers (BC-A) since the rule-assumed ballast conditions for these ships were the same. 99.5% of the ships in operation and being built are of standard BC-A type, not of a lighter carrying capacity.

To rectify the non-conformity, IACS embarked on a survey to receive shipping industry's feedback. In paragraph 4.3.2 of Annex of w.d. MSC 98/6/1 we read about the results of the survey: " …. IACS has tried to obtain new relevant loading statistics, which were not found for the ship type under target" (i.e. the BC-B or BC-C light type bulk carriers which as we said are

very-very few). "Instead they used limited statistics for BC-A ships which indicated that the ships operated 25% of their service time in heavy ballast condition". Thus for the corrective action IACS increased the heavy ballast condition of light cargo ships from 15% to 25%. Without doing the same for the other 99.5% of the bulk carrier fleet, the BC-A ships, based on the data of which the survey was completed. Namely IACS now has concrete information that BC-A operate 25% of the time in heavy ballast condition but the rules continue to assume only 15% and remain uncorrected.

The GBS relevant evaluation criterion asks (MSC 98/6/1 paragraph 4.3.3): Are assumed operating conditions (e.g. loaded and ballast) specified by the rules adequate for representative ship's operating profile?

Based on IACS own information, the answer for the representative small bulker is NO. Since the discrepancy was discovered in the process of addressing the auditors' non-conformity, IACS should have corrected the rules immediately while rectifying this non-conformance for BC-B and BC-C ships.

We respectfully ask the Committee to concur to this consequential change that will bring all bulk carriers below 200m in compliance with their actual operating profile, as indicated by the results of IACS survey and ask IACS to correct this important omission in the rules.

In conclusion the substance of all NCs that are related to consequential changes, observations or other pending issues emanating from the GBS audits have to be revisited once all relevant corrective actions have been completed. A commitment of IACS and its members is sought that all OBs and pending issues will be closed by a specified firm date followed by a thorough review addressing the affected NCs. In this regard a repetition of a GBS audit at the extent of the initial one would be necessary."

Statement by the observer from INTERCARGO

"INTERCARGO expresses its appreciation for the work of the Committee, the IMO Secretariat, IACS and of course of the audit team in submitting this report [which contains the Goal Based Standards verification audit conducted in order to verify the rectification of the six non-conformities NCs reported by the audit teams at the initial verification audit] especially since this 3-member team was assigned a heavy task in comparison to its capacity, given a very demanding workload in a short period of time, and the initial audit stating the need for more auditors [rather than teams of 3-5 members].

INTERCARGO would welcome the Committee's approving the rectification of non-conformities [NC01 - NC06]: But this is not to be seen as the end, but rather as the beginning of a process.

In our view, the Committee should consider a plan for an overall review of such acceptance - in a timeline it would decide- and consider unresolved issues, as the next ones we wish to bring to its attention:

NC01: its rectification should be considered in relevance to observation [IACS/2015] Functional Requirements 1-8/ OB02 which requires further examination.

NC02: Finite Element Analysis requirements should apply as for other types of ships: containerships & LNG carriers. The relevant observation [IACS/2015/FR1-8/] OB 05 should be addressed to reduce uncertainties related to non-linearities [geometrical, material], loading assumptions, worst loading conditions, and structural deformations.

NC03: load scenarios for BC-A bulk carriers in North Atlantic should also be revised. Statistical evidence for BC-A bulk carriers should not be reserved for rectifying only categories BC-B and BC-C.

NC04: the protective environment assumption for coating cannot apply to all types of tanks, nor for a 15-year target life.

NC05: the requirement should be incorporated to CSR and apply when ownership is transferred during the shipbuilding phase, so that the final shipowner taking delivery of the ship is fully informed.

In this context, we share the views of previous speaker Greece.

Dear Chair,

We are not making these requests because they are easy, nor because they are difficult, but because we must for the safety of those in the centre of our attention: the Seafarers.

As industry we owe it to them.

I kindly request a copy of this statement to be attached to the report of the Committee."

AGENDA ITEM 11

Statement by the delegation of the Philippines

"We thank the Secretariat for providing this Committee with document MSC 98/11.

We note, in particular, the request to this Committee to adopt, in accordance with resolution A.858(20), the new area to be avoided or ATBA as an associated protective measure (APM) for the "Tubbataha Reefs Natural Park Particularly Sensitive Sea Area (TRNP-PSSA) in the Sulu Sea". We thank this Committee for its decision to adopt the APM for the TRNP.

This delegation made a detailed presentation on the proposed ATBA at the meeting of the Experts Group on Ships Routeing held during NCSR 4. We thank the members of the Experts Group for their valuable comments and suggestions leading to the approval of our proposal and of the Sub-Committee for recommending to MSC 98 the adoption of the ATBA for the Tubbataha Reefs Natural Park.

The TRNP is an isolated and uninhabited coral reef area comprised of two atolls and one reef in the Sulu Sea. It is a nationally designated marine protected area comprised of a 970.3 sq. km. Core Zone surrounded by a 3500 sq. km. Buffer Zone. The TRNP is internationally designated as a UNESCO World Heritage Site, IUCN International Bird Area, and Ramsar Area.

We briefed last month the board members of the Tubbataha Reefs Protected Area Management Office in Puerto Princesa City, Palawan Province on the decision of NCSR 4 on the adoption of the APM for the TRNP as the safety measure that would accompany the designation of the reefs as a PSSA. The board was also briefed that this new routeing measure, as agreed at NCSR 4, will be implemented on 1 January 2018 at 0000 hours UTC. It was also advised that this new routeing measure will be submitted for adoption at MSC 98, and to MEPC 71 for the formal designation of the Park as a PSSA.

With these information, the TRNP Management Office is now putting in place the necessary orders to implement, monitor and study the effectiveness of the ATBA for the TRNP and to inform this Committee of any significant aspects of that study, as suggested by the Experts Group.

This delegation and the TRNP Management Office are aware that the ATBA is recommendatory in nature. But we are confident that with the adoption of this new routeing measure by the IMO MSC through a Safety of Navigation Circular, ship masters would observe the ATBA in order to help protect the pristine and delicate marine environment in the Tubbataha Reefs Natural Park.

Chair, the Philippines is pleased and honoured with the decision of this Committee to adopt this ATBA as the associated protective measure for the Tubbataha Reefs and to endorse it to MEPC 71 prior to the formal designation by the MEPC of the PSSA for the Tubbataha Reefs Natural Park.

Thank you, and we request that this statement be recorded in the report of MSC 98."

Statement by the delegation of Ukraine

"At the 97th session of the Maritime Safety Committee Georgia and Ukraine submitted the document MSC 97/4/2 "Safety and security of navigation in the North-Eastern part of the Black Sea". Consequently, it was agreed to begin monitoring situation with the security and safety of navigation in this part of the Black Sea and to notify the IMO about any threats to the security and safety of navigation in the North-Eastern part of the Black Sea.

At the 4th session of the Sub-Committee on Navigation, Communications and Search and Rescue Ukraine presented the document NCSR 4/INF.15 "Report on the implications for conduct of search and rescue operations in the Northern part of the Black Sea" and, accordingly, the Sub-Committee noted the information provided by Ukraine.

This delegation is however compelled to state that Ukraine is still facing great challenges in carrying out its international obligations in the maritime areas appertaining to the Crimean Peninsula, including the provision of safety and security of navigation, and search and rescue. The continued illegal occupation by the Russian Federation of the Autonomous Republic of Crimea and the city of Sevastopol as well as the Georgian territory of Abkhazia turns the Black Sea region from the area of stability and peace into a "grey zone".

The last incident deliberately instigated by the Russian Federation on 23 April 2017 when the Russian navy attempted to seize a Ukrainian rescue vessel clearly proves Russia’s disregard of all norms and principles of international law. This unlawful act committed by the Russian Federation had occurred during Ukrainian SAR regular exercises in Ukraine’s territorial waters and in Ukraine’s search and rescue region established according to the Agreement on Co-operation Regarding Maritime Search and Rescue Services among Black Sea Coastal States 1998 and the Agreement between the Cabinet of Ministers of Ukraine and the Government of the Russian Federation on Cooperation in Maritime and Aviation Search and Rescue in the Black and Azov Seas 2010.

Mr. Chair,

In the interest of time, we would avoid the reiteration of the whole list of international treaties and relevant UN General Assembly resolutions blatantly breached by the Russian Federation as Ukraine has already mentioned them in the documents submitted before.

This delegation would like to emphasize that protection of human lives at sea, ensuring security and safety of navigation are the responsibility of each coastal State under international law. Regrettably, unilateral actions of the Russian Federation, a member of the IMO Council, are aimed at precluding Ukraine from conducting search and rescue operations in the Northern part of the Black Sea.

In this connection, the Ukrainian Side demands from the Russian Federation to take all measures to prevent internationally wrongful acts in Ukraine's search and rescue region as well as to provide appropriate assurances and guarantees that they will not repeat it in the future.

Mr. Chair, we would appreciate if this statement is included in the report of this Committee."

AGENDA ITEM 15

Statement by the delegation of the Philippines

"This delegation wishes to thank the Secretariat for the comprehensive discussions on this agenda item in document MSC 98/15 and, through this intervention, submit our comments on the issue of piracy and armed robbery against ships in the Sulu-Celebes Sea, which is within the Philippine archipelagic waters and the delimited overlapping EEZ between the Philippines and Indonesia.

We greatly appreciate the valuable support under the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia – Information Sharing Centre (ReCAAP-ISC) that enabled the coastal states in the region to exercise vigilance and adopt relevant preventive measures.

Added to these measures, we wish to assure this Committee and the IMO that a policy with clear government action and monitoring is being undertaken by the Philippines to address the problem of piracy and armed robbery against ships in our waters.

We stress that Philippine governance provides the lead in combating piracy and armed robbery against ships in our exclusive economic zone and archipelagic waters. In line with this action, the Philippines has partnered with its neighbours in the Association of South East Asian Nations (ASEAN) in addressing the problem of the growing security challenges arising from the spread of terrorism and extremism as well as transnational crimes such as drug trafficking, human trafficking, piracy and cyber risks with the shared view that cooperation at the bilateral, regional and international levels is required in dealing with these global challenges.

The Philippines is also exchanging information and intelligence among security agencies at the bilateral level as well as within the ASEAN and INTERPOL frameworks to increase efficiency in addressing these challenges.

To address the incidence of piracy and assault on ship crews in the seas bordering the Philippines, Malaysia and Indonesia, we have entered into a Trilateral Co-operation Arrangement to patrol the sea lane where commercial vessels could pass with protection from the three nations' navies and, thereby, protect our common maritime borders. This Arrangement is an expression of the political and diplomatic unity to share manpower and resources to fight a common threat.

Under this Agreement, the Philippine Coast Guard will implement the Safety and Security Numbering System for all Philippine registered vessels and watercraft to facilitate identification and prevent their use for piracy, armed robbery and terrorism.

In addition, the Philippine Government, through the Coast Guard, will take steps to:

- establish a Transit Corridor in the Moro Gulf and Basilan Strait;
- prescribe radio communications equipment for Philippine registered vessels; and
- establish guidelines for the designation of marine band channel or frequency and for the accreditation of manufacturers and suppliers of radio communications equipment for marine security communication.

We hope that this Arrangement and implementing measures could serve as a good model for regional cooperation in combating piracy and as a means of promoting regional peace, security and stability.

Chair, the nature of piracy in our seas has complex political, security, social and economic elements. We do not wish to discuss these factors and their effects in the current peace and order campaign in southern Philippines except to stress that piracy in our waters has drawn concerted actions by ASEAN governments especially during the ASEAN Summit hosted by the Philippines this year. The Philippines and its ASEAN partners show visible and effective sovereign governance on this issue as we assure the Organization especially this Committee that this concerted action will continue until this problem in our seas is significantly resolved.

Thank you, Chair, and may we request that this statement be included in the records of MSC 98."

Statement by the delegation of the Spain

"Spain appreciates the note presented by the secretariat and the extensive information contained therein, which shows a worldwide reduction in the number of events reported to the Organization.

With regard to the situation on the waters off the coast of Somalia, this delegation shared the recommendations made by the Secretariat in paragraph 10 of document MSC 98/15 concerning flag States to continue to maintain adequate levels of Implementation of IMO guidelines and best management practices (BMPs) and that Governments should continue to provide naval resources.

In this connection, this delegation is pleased to inform the Committee that on 24 February Spain took over the command of the European Union Naval Force (Eunavfor), which is carrying out Operation Atalanta to combat piracy off the coast Somalia and Gulf of Aden waters, being the sixth time Spain has been at the helm of the operation since it began in December 2008.

Spain is the largest contributor to the Atalanta operation. The national personnel deployed in this operation total more than 300 military personnel, maintaining in the Indian Ocean surveillance plane based in Djibouti and providing three ships to the naval force of the European Union.

Finally, to inform the Committee that, on 22 April, the Spanish amphibious assault vessel 'Galicia' came to the aid of the 'Costina' flag of Sierra Leone, which was sailing on the coast of Somalia, after receiving a distress call in which he was informed that he was being attacked by a skiff. Thanks to the swift intervention of the Special Naval War Force Team, the ship was safe and was able to continue its journey.

We request that this statement be included in the Committee's final report"

"España agradece la nota presentada por la secretaria y la amplia información contenida en ella, la cual viene a poner de manifiesto una reducción a escala mundial de los sucesos notificados a la Organización.

Por lo que se refiere a la situación en las aguas frente a la costa de Somalia, esta delegación comparte la recomendaciones que la Secretaria formula en el párrafo 10 del documento MSC 98/15, relativas a que los Estados de abanderamiento continúen manteniendo niveles adecuados de implantación de las orientaciones de la OMI y mejores prácticas de gestión (BMP) y que los Gobiernos deben seguir ofreciendo recursos navales.

A este respecto, esta delegación se complace en informar al Comité que el pasado 24 de febrero España asumió el mando de la Fuerza Naval de la Unión Europea (Eunavfor), que lleva a cabo la operación Atalanta de lucha contra la piratería frente a las costas de Somalia y en aguas del Golfo de Adén, siendo la sexta vez que España se pone al frente de la operación desde que esta se inició en diciembre de 2008.

España es el mayor contribuyente de la operación Atalanta. El personal nacional desplegado en esta operación suma más de 300 militares, manteniendo en el Índico un avión de vigilancia marítima con base en Yibuti y aportando tres buques a la fuerza naval de la Unión Europea.

Por último, informar al Comité que, el pasado 22 de abril, el buque español de asalto anfibio 'Galicia' acudió en ayuda del buque 'Costina' de bandera de Sierra Leona, que se encontraba navegando en la costa de Somalia, tras recibir una llamada de socorro en la que se le informaba que estaba siendo atacado por un esquife. Gracias a la rápida intervención del Equipo de la Fuerza de Guerra Naval Especial el buque quedó a salvo y pudo continuar su viaje.

Solicitamos que esta declaración se incluya en el informe final del Comité."

Statement by the observer from the European Commission

"EU NAVFOR would like to take the opportunity to update the MSC on its recent activities. EU NAVFOR Operation Atalanta's Counter Piracy Naval Operation which has been mandated by the European Council and has been operating off the Coast of Somalia and the Gulf of Aden since December 2008 has 18 months left on its current mandate. Transition planning has been ongoing for 9 months and will continue into 2018. Member States of the European Union are currently considering a number of options for transition proposed by EU NAVFOR. Since March of this year there has been a spate of piracy attacks from Somali Pirate Groups against both commercial ships and transnational Dhows. The established Industry self-defence measures under BMP 4 together with the actions of Naval Forces has been effective in preventing hostages from becoming the norm once again. I would like to commend the Chinese Navy in particular in their successful boarding of the MV OS 35 and the subsequent arrest and transfer for prosecution of the 3 pirates on board. These attacks serve to remind us all that the dormant threat of Somali piracy has resurfaced once again. The conditions for Piracy in the Puntland and Galmudug semi-autonomous states in Somalia remain; economic, criminal, societal and other variables present at the very start of this Operation appear present in a very similar form today. Whilst Capacity Building efforts continue to make progress, the lack of security in many parts of Somalia remains an obstacle to real change. EU NAVFOR continues to work very closely with its military counter piracy partners CMF and the Independent Naval Operations from China, India, Japan, Korea and Russia through the SHADE process. However, it must be noted, that the Force Flow of warships in Operation Atalanta is much lower than it was at the height of the piracy threat in 2009-2012. It is therefore vital that Industry and Naval Forces continue to work in partnership in fulfilling all the measures in BMP4. EU NAVFOR and its maritime coordination centre MSCHOA have established a strong and mutually supportive relationship with Industry Organizations and Flag States on Somali Piracy going back 8 years.

This relationship has been centred on the sharing of information across many different subjects including Flag State LRIT data, support on prosecutions, the reporting of incidents and the influence that Industry Organizations and Flag States enjoy in encouraging owners and operators of vessels to comply with BMP4. However, there has been an evident higher threshold of risk being undertaken by some merchant ships as seen through the passage of increased volumes of ships through the Socotra Gap only 8 miles from the Puntland coast. This is seen by EU NAVFOR as only encouraging pirate groups to launch attacks as they did successfully against the ARIS 13 in March of this year. We would like to take this opportunity to remind them that our work is not yet done and that we ask them to continue to support our operation as we support the Shipping Industry. Thank you."

Statement by the delegation of Angola

"As this is the first time we take the floor during this Session, like others, we also express our deepest sympathy for those affected by terrorist attacks occurred recently in UK, Republic Islamic of Iran and other parts of the world.

Turning back to the issue in hand, we thank all submitters and note with concern the information provided on document MSC 98/15, particularly the issue regarding the increase of insecurity in waters of Gulf of Guinea in 2016, which reminds all that we must step up our efforts in making sure that all sorts of resources are available to ensure a substantial decrease in maritime crime incidents in the said region in future.

On the other hand, while Angola believes that such efforts have to be collective in its nature, she also believes the differences between a failed State in a given region and a region where all States are sovereign and independent. Therefore, all invited or uninvited initiatives to support, the Code of Conduct of Yaoundé, the blue economy or protecting African seafarers, have to leave out any foreign navy option – we simply do not need it in our waters and it will not be permitted.

We do not need to lecture anybody on strategic security or geopolitics but to remind that Gulf of Guinea is an area which is part of South Atlantic, thus any thoughts of deploying navy promoted by a State or half-dozen States to counter maritime insecurity must, in our humble opinion, consider two more players: Southern African Development Community (SADC) and South Atlantic Peace and Cooperation Zone (ZPCAS) created in 1986 by UN Assembly resolution 41/11. Any unilateral or international naval deployment will pose a considerable potential threat to the entire zone's stability, the repercussions of which will be felt in many parts of the world for years to come.

We therefore urge those contemplating a Somali style deployment of international naval forces in the Gulf of Guinea to reconsider their positions. We advise them to better formulate workable mechanisms to help countries in the Gulf of Guinea to navigate the pitfalls that hinder implementation of various regional and continental strategies already in place.

That said, Mr. Chair, Secretary-General, and distinguished delegates, Angola reiterates its upmost support in combating all kinds of maritime crime at sea and has so far contributed by for instance organizing jointly with the IMO, in our country, the first regional workshop for the implementation of Yaoundé Code of Conduct in March 2015.

Finally, as in the past, again we emphasize that constructive progress in this issue can only take place if States of the region, the IMO and other interested parties work together on a single platform where transparency, genuine cooperation and mutual respect are observed.

Thank you! We would appreciate if our statement is reflected in the final Report."

Statement by the delegation of Nigeria

"Piracy is a global challenge which is not peculiar to one continent. However, Member States of the Gulf of Guinea (GoG) are making efforts at continental, regional and national levels to address this menace.

The African Union in 2015 made a declaration on the Code of Conduct at Yaoundé as mentioned by Cameroon and more recently in December 2015 at the conference of the G7++ Friends of the GoG met in Cape Verde Island, to appraise the redemption of commitments by the affected countries regarding the Yaoundé declaration. As Nigeria's collaboration to that commitment, a vessel MV Olivia was arrested while escaping from Benin Republic for security breach, for which Nigeria was commended by the G7 Group.

Further to this, African Union in October 2016 in Lomé-Cotonou signed a Charter on Maritime Security, Safety and Development. The Charter was entirely on security and safety of the maritime domain in the Gulf of Guinea.

Piracy was further brought into fore in April this year at the 3rd Workshop of the Association of Heads of African Maritime Administration (AAMA) held in Abuja, Nigeria. Member States are to re-enforce regional cooperation and coordination, enhance information sharing and regulatory governance to combat the menace of piracy and other maritime crimes while maintaining a balance between security and facilitation of global trade.

At the National level, the Nigerian government is currently processing procurement of an integrated maritime security surveillance system for intelligence and information gathering/sharing among security agencies. Amongst which is the procurement of 3 helicopters and 12 intervention vessels for surveillance of Inland water ways, Coastal and the GoG.

Furthermore, there is currently an Anti-Piracy Bill in Nigeria which is at an advance stage of being passed into law to give effect to the relevant provisions of the United Nations Convention on the Law of the Sea (UNCLOS) 1982 and the Convention for the Suppression of Unlawful Acts at Sea, 1988 and it's Protocol of 2005 to punish and deter piracy and other maritime crimes.

Nigeria remains open to collaboration with Member States and Industry on improved reporting of piracy incidences in the Gulf of Guinea towards containing this menace but this should be done with the consent of Coastal States."

Statement by the delegation of Pakistan

"The contemporary security environment is complex, challenging and evolving. Threats to maritime security in the Indian Ocean region emanate primarily from challenges like piracy, maritime terrorism, human and arms-narco smuggling. According to the IMB Report on Piracy and Armed Robbery, in 2016 piracy and armed robbery at sea has fallen to its lowest ebb since 1995. The report indicated that out of 191 total incidents of attempted piracy in 2016, 17 were reported in Western Indian Ocean, all of which were well outside Pakistan's Exclusive Economic Zone. This reduction in piracy is primarily attributed to the regional and international collaborative maritime security initiatives and adoption of Best Management Practices by merchant vessels. However, this may be temporary and piracy may return if the root causes of piracy are not addressed.

Maritime terrorism in the region, however, has gained fresh impetus after the rise of ISIS and instability in Yemen and Levant. Targeting of MV SWIFT (1 Oct 16), failed attacks on USS MASON and PONCE (8 Oct 16) near Bab-Al Mendeb and attack on RSNF AL MADINAH (30 Jan 17) in the Red Sea are indicative of the capability and intent of the non-state actors operating in the region.

Pakistan supports the traditional freedom of navigation on High Seas and would not like to see the International Law undermined. Considering Pakistan's reliance on sea trade and recent operationalization of China-Pakistan Economic Corridor (CPEC), the most significant maritime challenge for Pakistan is ensuring security and stability on the High Seas in the region. In this regard, Pakistan cannot remain oblivious to the threat posed in maritime domain by some of the regional countries that have publically avowed to destabilise the national security and economic development.

Pakistan's contributions to counter threats of maritime terrorism and piracy have been substantial and perhaps unparalleled in the region. Pakistan was the first regional nation to join the international collaborative efforts for ensuring security and stability in maritime domain and has been contributing significantly in the Combined Task Force-150 aimed at countering maritime terrorism and in Combined Task Force-151 aimed at countering piracy since 2004 and 2009 respectively. In this regard, Pakistan Navy's contribution so far includes participation of ships and aircraft clocking more than 100,000 sea hours and 8,500 flying hours. These ships and aircraft have investigated over 12,000 ships/craft, carried out over 400 boarding operations and confiscated nearly 4 tonnes of hashish and cannabis resin. With 17 command tenures of both the Task Forces by Pakistan Navy (PN) officers, its contributions in the initiatives have remained second only to the United States Navy.

In addition to participation in the international collaborative efforts, Pakistan has taken number of other initiatives to bolster regional maritime security. This include:

.1 Establishment of a Joint Maritime Information and Coordination Centre (JMICC) in 2012 to harness efforts of all relevant national agencies and a number of international stakeholders to improve maritime security and to coordinate effectively for prevention of any illegal activity in the maritime domain.

.2 Regular holding of AMAN series of multinational exercise on biennial basis since 2007. The exercise is manifestation of Pakistan's commitment towards bringing the navies of the East and West on one platform for the good of global commons.

.3 Pakistan is also a member of Indian Ocean Naval Symposium (IONS) and an observer in the Western Pacific Naval Symposium (WPNS).

On the domestic front, Pakistan has established an elaborate coastal security mechanism comprising of a number of security stations all along the coast to monitor and respond to any emerging threat. Pakistan Maritime Security Agency (PMSA) which is the principal maritime law enforcement agency, operates in perfect harmony with PN to monitor fishing traffic and patrol the Maritime Zones of Pakistan against poaching, drug trafficking, smuggling and other illicit activities.

Pakistan believes in collaborative security for ensuring stable and conducive maritime environment for economic activities. Pakistan has always reached out, engaged and hosted its partners on issues of common interest while making significant contribution towards regional maritime security and stability.

Thank you Mr. Chair and may I request you to please include this statement as annex to the final report."

Statement by the observer from RECAAP-ISC

"With reference to MSC 98/15/1, MSC Circular 1333/1334 advocate the reporting of Piracy / Armed Robbery incidents to the nearest coastal state as they have the responsibility and (legal) jurisdiction to respond, apprehend and prosecute those who are associated with the maritime crime.

Whilst we are supportive in principle, to promote reporting to other agencies / regional setup to address the maritime crime, we are of the view that having it incorporated into same level or similar MSC Circulars, is inappropriate, as it would dilute the responsibility / function of the Coastal State's role in addressing the maritime crime.

May we request that this be recorded in the update please."

AGENDA ITEM 16

Statement by the delegation of Malta

"Malta would like to thank the International Chamber of Shipping for their paper MSC 98/16 with regards to Unsafe Mixed Migration by Sea drawing attention to an extremely important topic which unfortunately has become a heart-breaking reality.

The ICS paper provides important information that highlights the importance of this issue. Of particular importance for the way forward is paragraph 10 of the paper. Malta fully supports this way ahead.

Malta also wants to highlight what Maltese delegations have constantly maintained that the international legal regime, including the procedures in place by the industry, need to be revisited in order to ensure that these address present day realities.

In rendering salvage the salvor is guaranteed a safety net to ensure that assistance is always rendered to safeguard from loss of life and the protection of the marine environment.

However, in the case of unsafe migration at sea, the rescue vessel when rendering assistance as required by international law and by the national legislation of probably all Member States, the rescue vessel and other ships involved may be subjected to substantial hardship when taking into account the number of persons that may have to be taken on board.

Amongst others is a force majeure breach of the SOLAS LSA requirements, possible effects on stability and overloading and several other grievances related to colossal time and financial losses. The psychological disturbance afforded to the crew members of the vessels rendering assistance as mentioned by the distinguished representative of the ICS is also of serious consideration.

There do not exist any safety nets for vessels rendering this type of assistance – albeit the number of persons saved from the perils of the sea could, often enough, be alarmingly substantial. That is why we believe that this would be in the interest of all concerned.
Fears about the integrity of UNCLOS are unfounded. First of all Malta is only advocating revisiting and not revision of the international regime and, furthermore, because we see no reason why UNCLOS needs to be touched. In any case, this could be dealt with in depth by the Legal Committee.

Meanwhile Malta reiterates its full support for the ICS paper we have in front of us."

Statement by the delegation of Spain

"España agradece el documento presentado por ICS y comparte las preocupaciones mostradas en el mismo acerca de la crisis humanitaria existente en la región del Mediterráneo.

Compartimos igualmente con ICS su planteamiento de que debería ser posible que la Organización manifestara su preocupación de carácter humanitario con respecto a la continua pérdida de vidas humanas en el mar y fomente y apoye unas medidas apropiadas y efectivas en el seno de las Naciones Unidas.

Sin embargo, no compartimos la idea expresada en el párrafo 10 del documento de que la búsqueda y salvamento sea una respuesta a corto plazo para quienes están expuestos a peligros en el mar y no una solución política a largo plazo.

Consideramos que la respuesta que se ofrece en la marco de la búsqueda y salvamento es simplemente eso, una respuesta. Respuesta de carácter técnico que se ofrece en virtud de las obligaciones contraídas por distintos convenios internacionales, sin que deba ir revestida en ningún caso de connotaciones políticas ni limitaciones en cuanto a los plazos de ejecución de las misma.

En el ámbito de la CONVEMAR, del SOLAS o del convenio SAR, se responde siempre, sin hacer distinción de la causa que provoca la movilización de los medios a efectos de búsqueda y salvamento. Es por ello, que tampoco podemos compartir los expresado nuevamente en el párrafo 10 del documento acerca de que para esta Organización sea imperativo garantizar que se eviten las consecuencias no intencionadas con respecto a las obligaciones en el marco de la búsqueda y salvamento.

A este respecto, nos gustaría recordarle al comité que si bien la crisis migratoria que afecta al mediterráneo central es acuciante, existen otras rutas que son usadas de forma continuada por las redes que trafican con personas.

En el caso de las costas españolas, esta situación provoca que año tras año miles de personas sean rescatadas en el mar por nuestros servicios de salvamento marítimo. Por citar una cifra ilustrativa, en el periodo comprendido entre el enero de 2015 y abril de 2017 fueron rescatadas en nuestras costas un total de 14.000 migrantes. Esta situación provocó que en el referido periodo se llevasen a cabo más de 1000 operaciones de búsqueda y salvamento, es decir una media de 30 operaciones cada mes. Operacioes para las cuales España destina importantes recursos materiales y humanos, tanto marítimos, como terrestres y aéreos.

Esta delegación es consciente de la complejidad que entraña la búsqueda de soluciones en esta materia, máxime teniendo en cuenta el mandato de este Comité y de la Organización, pero a pesar de ello consideramos necesario que se continúen realizando esfuerzos por paliar la situación.

Quizás, y tal y como cita ICS en su documento, una nueva cumbre interorganismo pudiera resultar lo adecuado en este caso, teniendo en cuenta los mandatos de los diferentes organismos especializados de las Naciones Unidas.

En cualquier caso, España pone a disposición de la Organización su experiencia como frontera sur de Europa en materia de migración y su capacidad de colaboración en el desarrollo de las medidas que este comité considere oportuno adoptar en relación con esta materia objeto de debate.

Se solicita que esta declaración sea incluida en el informe final del comité."

Statement by the observer from ICS

"ICS is pleased to introduce document MSC 98/16 which is on the need for further international action in response to the growing migrant crisis in the central Mediterranean region. Our paper highlights the distressing trend in the number of migrants reported missing or dead following attempts to cross the central Mediterranean in unseaworthy craft at the mercy of people smugglers.

The trend is explained in paragraph 5 of the submission which provides comparative figures for 2014, 15, 16 and the opening months of 2017 based on data from UNHCR and IOM. If the experience at the start of 2017 is an indicator, then 2017 may prove to be the most challenging year so far.

The trend suggests that the situation in the central Mediterranean region is a very significant and growing challenge. This is evident despite the concerted search and rescue efforts of government resources, merchant ships and non-governmental organizations, and the efforts of vessels operating under the non-Search and Rescue mandates of FRONTEX and the European Naval Force Mediterranean.

Despite government-funded resources and the activity of NGO vessels, the number of merchant ships involved in rescue operations has remained relatively constant since 2015. In 2016, a total of 381 merchant ships were diverted and 121 ships were involved in the rescue of 13,888 people. This means that on average, merchant ships embarked 110 people per rescue. These rescues have both an immediate and a long-term impact on seafarers which is both physical and psychological.

Mr. Chair, the impact on seafarers cannot be overlooked.

The contribution of coastal States, particularly Italy, should also be recognized. The shipping industry appreciates very much their unwavering commitment to the prompt disembarkation of those rescued at sea to a place of safety even in the face of competing priorities.

In light of the current situation and the need for an effective international response, ICS has written separately to the UN Secretary-General re-iterating the need for a UN led international response, and to the IMO Secretary-General, the United Nations High Commissioner for Refugees and the Director-General of IOM. We invited all three organizations to convene a further inter-agency summit and to work together to promote active United Nations engagement to mitigate the situation in the Central Mediterranean region. These three agencies working together should make a significant contribution to the global compact on migration based on the New York Declaration of September 2016.

ICS is not proposing that this Organization should take a unilateral leading role in addressing the crisis in the central Mediterranean region. The situation is far too complex and the mandates of the Organization and of this Committee are limited. However it is proposed that it would be appropriate for the Organization to:

.1 Express humanitarian concern over the continuing loss of life at sea and to promote and support appropriate and effective action at the United Nations, including support for the adoption of the global compact on migration in 2018; and

.2 Ensure that Search and Rescue does not become part of the solution. SAR is a short-term response to those in danger at sea, it is not a long-term policy solution. Nor should SAR be considered a permanent pillar within the global compact on migration

With these factors in mind, ICS recommends that your Committee should consider:

- Forwarding this submission to the next session of the IMO Council for further consideration under the agenda item on Relations with the United Nations and its specialized agencies;

- To invite the Council to encourage Member States to promote substantial and meaningful action to reduce the need for rescues at sea, particularly during inter-governmental preparations for the global compact on migration in 2018; and

- To invite the IMO Secretary General to convey the Organization's deep concerns to the United Nations.

Mr. Chair the growing toll of lives lost through drowning is a humanitarian crisis of the deepest concern. Above all other considerations, the relevant United Nation's agencies must take expedient action to address this terrible loss of life. The Global Compact will not be concluded until 2018 and several thousands of people are likely to die in the interim."

Statement by the observer from IFSMA

"IFSMA would like to thank ICS for the paper MSC 98/16 and fully support all of the points and issues they raise and the Data they highlight from UNHCR and IOM is both shocking and of continued concern to us. Although the numbers of merchant ships being diverted by Rescue Co-ordination Centres has slightly reduced because of the increased resource being provided by EU Member States and others, but it must be remembered that from a Shipmasters point of view, it is they and their crews who are very much still in the front line and the point ICS make in paragraph 10 of their paper of "the immediate and long-term effects on seafarers, both physical and psychological, of mass rescue operations in the central Mediterranean region cannot be overlooked". This point was very firmly highlighted to me as a Panel Member for the IMO Exceptional Bravery at Sea Awards and some of the dramatic and traumatic incidents that Shipmasters and their Crews were involved in 2016. IFSMA is very grateful for the support and counselling they have been given by their companies and others, but this is not always the case. We must do all we can to ensure that our Seafarers, and the effects these incidents have on them, are not forgotten as the traumatic effects often only come to light months or years into the future. We must remember that they are civilians and not trained like the Military, professional SAR crews and the other specialised Services involved. I will forward this statement to the Secretariat for inclusion in the Committee Report."

Statement by the observer from IOM

"As the COM of IOM in the UK, I am honored be here this afternoon on behalf of IOM at the IMO MSC 98, renewing as we did before in 2015 in this location, together with colleagues from UNHCR, IMO, UNODC and many of your Governments our common efforts to address the challenges brought about by large migratory flows across unsafe routes and transportation means. We had come together in December 2014 through a Joint Statement on Protection at Sea in the 21st Century during the UNHCR High Commissioner's Dialogue on Protection at Sea, and together participated to the High Level Inter-agency meeting at IMO in 2015.

More recently on 7 April 2017, at the United Nations General Assembly 75th Plenary Meeting – 71st Session, at the session on "Global Awareness of the Tragedies of Irregular Migrants in the Mediterranean basin with specific emphasis on Syrian asylum seekers" both IOM and UNHCR representatives delivered testimonies and statements at the beginning of the debate.

While the statistics on fatalities also recorded through the IOM Missing Migrants initiative, indicate that the situation overall is alarming, it is important to understand why people are taking these perilous journeys across the Mediterranean, the Andaman, the Gulf of Aden, Bay of Bengal and other seas. A recent report from the University of Warwick on interviews conducted in 2015 and 2016 indicates that many of those leaving their homes in Africa did not originally intend to come to Europe. Many thought there would be opportunities elsewhere closer to home within Africa, eventually ended up in Libya, and then were compelled to pursue their journey onwards in search of more stable and secure environments. Even once embarked, many did not realize they were heading for Europe!

Although migration routes are not becoming any safer, some migrants still continuously decide that this is a risk worth taking. Data shows us that the number of migrants is still on the rise. How then – in this age of humanitarian crises – can the international community respond more effectively to these disasters? How can we better respond to a migrant dying of thirst on the Andaman Sea, drowning in the Mediterranean, or suffocating in the false compartment under a truck crossing a border? These people are seeking jobs or safety that has proved to be out of reach in their country of origin.

The challenge we face goes beyond emergency situations. The clear majority of migrants are simply looking for employment opportunities, opportunities to accomplish their hopes, aspirations and happiness. Simply an opportunity for a better life – a combination of factors and drivers at play. They are looking for this in a world that does not yet have an agreed framework which addresses the multi-faceted aspects of contemporary mobility.

A comprehensive, long-term, multi-faceted, "whole-of-government" and "whole-of-society" approach to migration governance is needed, which would:

- Give top priority to saving lives
- Open more regular channels of migration as viable alternatives to irregular migration channels
- Establish humanitarian border management
- Tackle migrant smuggling and trafficking
- Strengthen capacity to respond to humanitarian emergencies
- Develop effective integration programs
- Establish public education and public information programs

In mentioning these priorities, it is encouraging that in response to the growing concerns on the challenges posed by large flows over land and across seas in all regions of the globe, on 19 September 2016 Heads of State came together in New York at the start of the UN General Assembly to approve the New York Declaration for Refugees and Migrants.

Paragraph 28 of the NY Declaration states: "We express our profound concern at the large number of people who have lost their lives in transit. We commend the efforts already made to rescue people in distress at sea. We commit to intensifying international cooperation on the strengthening of search and rescue mechanisms. We will also work to improve the availability of accurate data on the whereabouts of people and vessels stranded at sea. In addition, we will strengthen support for rescue efforts over land along dangerous or isolated routes. We will draw attention to the risks involved in the use of such routes in the first instance."

The outcomes of 19 September have set in process intergovernmental consultations in 2017 leading to negotiation of a global compact for safe, orderly and regular migration (Global Compact on Migration or GCM) by the end of 2018.

This commitment by the international community is an important recognition that migration is a major issue in the global agenda requiring a comprehensive approach to human mobility and enhanced cooperation.

The Global Compact is a UN Member State-led process comprising 3 phases:

.1 First, the consultations phase which is to take place between April and November 2017. This phase will enable all stakeholders to express their needs, interests and concerns. It will encompass informal thematic consultations, multi-stakeholder hearings (including civil society, migrant and diaspora organizations, academia and the private sector), regional consultations (RECs and RCPs), and national consultations.

The process of consultation also includes six informal thematic consultations which will be held alternately in New York, Geneva and Vienna on:

1. Human rights and social inclusion
2. Addressing the drivers of migration
3. International cooperation and governance on migration
4. Contributions of migrants and diasporas to development
5. Smuggling of migrants and trafficking in persons
6. Irregular migration and regular pathways

.2 A stocktaking phase, is to take place between November 2017 and February 2018. The outcomes of all the consultations in the first phase will be fed into a preparatory stocktaking meeting hosted by Mexico at the end of the year.

.3 Finally, a zero draft of the global compact will be presented to Member States by early February 2018 to launch the final and third phase of intergovernmental negotiations in New York, The instrument emerging from that work will be considered for adoption at an intergovernmental conference on international migration, in 2018.

The consultative process, the first phase taking place at the moment up to November, is designed to solicit views from a wide range of stakeholders, including the private sector and civil society.

The GCM presents a valuable opportunity for the international community to move away from reactive approaches to migration governance, and to determine the steps to be taken to reach a common future in which migration is safe, orderly and regular.

Although it is a state-led process, the effort is being made through the global compact on migration consultations to reflect varying perspectives from different stakeholders, including civil society and migrants themselves. Ultimately, the GCM aims to create a set of common understandings among all actors on migration governance reflecting the widest range of perspectives and common agreements. In addition to the UN's website (http://refugeesmigrants.un.org/), a range of resources relevant to the global compact on migration process can be found on the IOM global compact on migration webpage, accessible from the IOM website.

As the UN agency on migration, IOM is committed to support such a process through technical and policy expertise and looks forward to the outcomes and recommendations out of such a wide consultative process - the largest of its nature to-date…. and to pursue its recommendations in conjunction with partners, including Governments, civil society, IMO, UNHCR, UNODC and all other relevant stakeholders."

Statement by the observer from UNHCR

"Thank you for this opportunity to address the Committee on behalf of UNHCR. UNHCR welcomes the fact that unsafe mixed migration at sea has become a standing item on the MSC's agenda, but deeply regrets the circumstances that have made it necessary. Indeed, when it comes to maritime safety and dangers to human life at sea, there can be no more pressing issue facing the international community.

Let me begin by recalling that—although it is the developments, challenges and tragedies in the Central Mediterranean Sea that have been specifically drawn to the attention of the Committee, and indeed continue to capture the greater part of the media's attention—unsafe mixed migration by sea continues to touch every corner of the globe, from the Andaman Sea to the Gulf of Aden and the Caribbean. Allow me to recall also that behind the term 'unsafe mixed migration by sea'—that is, unsafe crossings by refugees fleeing conflict or persecution, alongside migrants moving for other reasons—lies one unassailable fact: no-one, whether refugee or migrant, boards a flimsy rubber dinghy or an overcrowded, recycled fishing boat unless they have been led to do so by great desperation, great hope, great misinformation—or some mix of these.

The response to extraordinary search-and-rescue needs in the Central Mediterranean—by coastal states, civil society, merchant shipping, multilateral operations with non-SAR mandates, and others—has been impressive. Nonetheless, more than 1,850 refugees and migrants are believed to have died or gone missing in the Mediterranean so far in 2017. [Sixty more people, that we know of, lost their lives or are feared missing following incidents off the coast of Libya just this past weekend.]

Clearly, the SAR regime is not sufficient—by itself—to meet these challenges or to prevent further loss of life. But of course SAR responses are necessary and will remain a vital part of the response until the root causes of refugee displacement and the drivers of unsafe migration are addressed. The frustrations of shipmasters who do not hesitate to come to the aid of those in distress—but who feel that they are being asked to palliate the symptoms of a much broader and deeper humanitarian crisis, and question whether the SAR system itself can withstand the strain that is being placed upon it—are clear and understood. We thank the ICS for placing them on the agenda of this Committee, and for raising them with directly UNHCR and our partner agencies. The fundamental principle that assistance is to be provided to anyone in distress at sea regardless of their nationality, status, or circumstances must, of course, not be weakened. But only comprehensive, multifaceted, and sustained responses involving a wide range of states and other actors can hope to make a positive difference.

This 'bigger picture', as UNHCR has had many occasions before this Committee and elsewhere to highlight, demands responses which must include credible and accessible pathways to safety and international protection for refugees fleeing conflict and persecution, which afford an alternative to the services of people smugglers and putting one's life in danger at sea. They must also include expanded access to safe and regular migration channels for both migrants and refugees; a strategic approach to addressing migrant smuggling; improved safety, security and access to international protection in countries that refugees and migrants transit through, or in which they are hosted; and, ultimately, the resolution of ongoing conflicts, crises, and governance failures that lie at the source of so many desperate journeys. Some of these can be, with sufficient will—and in fact are being—tackled in the immediate term. Others, needless to say, are much longer-term, recurring challenges.

With that in mind, I would like to end with one note of caution, and but also some signs of hope.

First, the caution. The tragedies that take place on an all-too-regular basis when large numbers of refugees and migrants take to the sea are in reality the iceberg-tip of a complex set of interlinked challenges in countries of origin, transit, and destination. Action on all fronts is indeed possible and necessary—but there are no 'quick fixes'. We must continue to save as many lives at sea as we can, at the same time as we continue to pursue solutions to the 'bigger picture' issues I have mentioned, and protect the right of those fleeing conflict and persecution to seek and enjoy asylum.

Finally, the signs of hope. As delegates to this Committee will be aware, in September last year Member States of the United Nations unanimously adopted the New York Declaration for Refugees and Migrants. The Declaration commits Member States to 'intensifying international cooperation on the strengthening of search and rescue mechanisms'. It also contains a wide range of commitments to address the 'bigger picture', including root causes of displacement in countries of origin, drivers of unsafe migration, and support to host countries and communities. Most importantly, it sets out processes which are hoped to lead to two new Global Compacts in 2018: a Global Compact on Refugees, and a Global Compact for Safe, Orderly and Regular Migration. These processes represent an unprecedented coming together of the international community on these issues, and a real opportunity to address some of the deeper causes behind the current situation in the Central Mediterranean in a truly comprehensive and concerted way. An opportunity that must not be squandered."

Statement by the observer from UNODC

"Since the December 2014 call for concerted action to address mixed migration at sea and its dangers jointly issued by our organizations (UNODC, UNHCR, IOM, IMO, OHCHR), the death toll among migrants and refugees in the Mediterranean has steadily increased. No migrants take the sea on their own anymore. They overwhelmingly rely of smugglers who organize the sea crossing for them, while adapting their modus operandi as the response to the facilitated mixed migration flows shifts. Not only have the travel conditions worsened as smugglers focus on maximizing their profits, but the conditions prior to departure along some routes have become horrendous and often involve deprivation of liberty, ill-treatment and sexual abuse, kidnapping and extortion.

The criminal networks involved in organizing the departure of boats from transit countries around the Mediterranean do not need to hide their operations anymore. On the opposite, they exploit the legal obligation to assist vessels and persons in distress at sea. This has led to the novel situation we are faced with where vessels – be them from national authorities, regional agencies, the civil society, or the private sector –, while conforming with their obligation of search and rescue, are unwillingly forming part of the smuggling modus operandi.

Yet, safety and legality must come first. Rescue operations cannot be halted in a bid to deter departures of unseaworthy boats. Practitioners from origin, transit and destination countries who attended UNODC workshops on migrant smuggling by sea identified that ships and crews, especially on private vessels, are not equipped for large scale rescue operations. They also stressed that securing rapid and safe disembarkation with the authorization of competent State authorities while safeguarding the non-refoulement principle is a challenges.

Beside the Law of the Sea, the framework on addressing transnational organized crime, and in particular the Protocol against the Smuggling of Migrants by Land, Air and Sea supplementing the United Nations Convention against Transnational Organized Crime (UNTOC), specifically addresses cooperation at sea against migrant smuggling (Chapter II). In this context, States have reiterated that States should not hold seafarers who have assisted,

rescued or disembarked smuggled migrants in distress at sea criminally liable. States have also agreed to consider establishing jurisdiction over incidents of migrant smuggling on the high seas involving unflagged vessels, including incidents in which the transportation of the migrants to shore by rescuers is the result of the deliberate conduct of the smugglers aimed at provoking the rescue of the migrants. [Recommendations of the Working Group to the Conference of the Parties to the UNTOC on the Smuggling of Migrants]

UNODC has continued supporting States in these efforts, in particular in transit and origin countries, by reinforcing the capacity of front line officers to detect migrant smuggling and human trafficking ventures and by equipping the criminal justice practitioners with the means to disrupt the smuggling business model, seize the assets of the crime, bring organizers to justice and ensure the protection of smuggled persons and victims. Through its broader mandate, UNODC also contributes to addressing root causes of irregular migration, in particular by assisting States scale up their response to corruption, terrorism and organized crime.

Let me stress that we, more than ever, need a comprehensive response based on States shared commitments. These commitments are expected to be examined, renewed, and possibly consolidated in the lead up to the adoption of a Global Compact for Safe, Orderly and Regular Migration next year. The challenges posed by the current situation in the central Mediterranean region need to be addressed in this context, with the support of the UN family and other international, regional and non-governmental organizations. Indeed, we look forward to holding in September in Vienna the Thematic Session of the General Assembly on "smuggling of migrants, trafficking in persons and contemporary forms of slavery, including appropriate identification, protection and assistance to migrants and trafficking victims", where the issue of smuggling and casualties at sea and their impact, including on vessels engaged in search and rescue, needs to be raised."

AGENDA ITEM 20

Statement by the delegation of the Philippines

"We thank all the co-sponsors involved in the submission of document MSC 98/20/2 and comments made by ITF on MSC 98/20/13.

The Philippines shares the views of co-sponsors that the use of Maritime Autonomous Surface Ships or MASS requires a regulatory framework for such ships and their interaction and co-existence with manned ships. This delegation strongly holds the view that such regulatory framework must address the matter of the interaction of seafarers and port workers for what we could call "drone" ships.

We agree that automation is an emerging technology that is dawning upon the shipping industry especially for seafarers worldwide. The seafaring industry should welcome this and pave the way for its further development.

In the Philippines, one of our maritime higher education institutions, the Maritime Academy for Asia and the Pacific, has a drone so that its cadets would be familiar with remote controls. The Academy has strengthened its automation subjects this semester because it believes that "automation is good if we are good enough for it." Thus, next semester, the Academy shall have an elective on ship automation and robotics, including inviting guest speakers who are experts in this field, in order to prepare their graduates to be "suitable for automation."

As maritime higher education institutions prepare for automation, this delegation stresses that the IMO, in the development of the regulatory framework, must engage with the manufacturers, ship owners and all its affiliates, especially the Member States that provides seafarers to the international shipping community, who must be among the key proactive driving forces in Maritime Autonomous Surface Ships because they will be the first sector to be affected due to loss of employment opportunities.

Automation of surface ships raises the potential of a reduction of cargo ships complement to 5-6 highly technical crews within the next 10 years.

This Organization has placed human resources or seafarers as one of the main pillars of the industry and as an over-arching component in its strategic objective and work programme. Seafarers should be viewed in a positive light, as an enabler for technological advancement and as being cost effective for they do good work including humanitarian activities for the maritime industry. Furthermore, seafarers and their families contribute to the betterment of societies in developing countries.

This delegation wishes to make it clear - Member States that provide seafarers and seafaring organizations or unions are for the technological advancement of the shipping industry but not at the cost of employment for seafarers and port workers.

We need to put a humanitarian and social consciousness component in the regulatory framework that this Organization would develop for MASS, in order to complement the objective for the safe, secure and environmental operation of such ships within the existing IMO instruments. It is for this reason that we support the views expressed in paragraph 21 on Human Element of document MSC 98/20/2 that the "Human Element would be an area of consideration within the proposed scoping exercise."

On the matter of safe operation of MASS, MSC may wish to consider more redundant systems for the main propulsion, auxiliary machineries, control systems and communications facilities, among others. Moreover, the shore-based controllers should have seafaring experience and if possible, be categorized as seafarers. Further, riding gangs for ships repairs should also be considered seafarers and not as "industrial personnel."

This delegation invites delegations to MSC 98 to consider these points when developing the regulatory framework as we plot the course of the industry towards that stage when unmanned and autonomous surface ships are the key platforms for the transport of cargoes and passengers.

We would also like to align ourselves to what ITF and ICS have raised. We also support the proposal to include this new item on MASS in the work programme.

Thank you, Chair, and may we request that this statement be included in the report of MSC 98."

AGENDA ITEM 22

Statement by the delegation of Vanuatu

"As a co-sponsor to paper MSC 98/22/6 we of course fully support its content. As a Small Island Developing State, Vanuatu faces serious difficulties in patrolling and therefore protecting and preserving its marine resources in its waters where IUU fishing activities are sadly common practices.

Given the archipelagic nature of our country and our very limited resources, Vanuatu is too often exposed to illegal fishing activities in its waters where small fishing vessels are regularly spotted from shore without any means to identifying them and hence reporting them to the appropriate authorities.

The extension of the non-mandatory application of the IMO Ship Identification Number Scheme to specifically fishing vessels of non-steel hull construction of 100 gross tonnage and above; and all motorized inboard fishing vessels of less than 100 gross tonnage down to a size limit of 12 metres in length overall would facilitate the identification of fishing vessels engaged in IUU fishing.

In our views, the inclusion of wooden fishing vessels is welcomed. For some years Vanuatu and other countries in the Pacific Region have been at the mercy of small wooden fishing vessels coming from some far off countries. These vessels have been spotted in Australia, Federated States of Micronesia, New Caledonia, Palau, Papua New Guinea, the Solomon Islands and Vanuatu. This growing threat in the Pacific is a serious concern raised during the annual Western and Central Pacific Fisheries Commission (WCPFC) which met in Fiji in December last year.

The extension of the scheme being voluntary by nature would only become effective if mandated and enforced by National Authorities. An active involvement of National Authorities is therefore highly recommended in view of ensuring that the information provided to IHS is true before an IMO number is issued hence facilitating the identification of fishing vessels engaged in IUU fishing."

Statement by the observer from IBIA

"We would like to thank Brazil and Chile for their paper MSC 98/22/8 and Brazil for paper MSC 98/22/10. We agree that there is a need to keep a close eye on the safety implications associated with efforts to meet demand for fuels complying with the 0.50% sulphur limit that is due to take effect on 1 January 2020.

It is our understanding that, although the terms of reference for the availability study from MEPC 68 in 2015 requested the contractor to model the possible adjustment of the marine fuel oil flashpoint limit to 52°C, the conclusion that there would be sufficient refinery capacity to meet both marine and non-marine demand for fuel in 2020 did not rely on lowering the flashpoint limit from the current SOLAS requirement of 60°C.
Furthermore, this committee, at its 96th session in May 2016, decided that all safety concerns with regard to ships using low-flashpoint fuels should be addressed in the context of the IGF Code only, and to not reopen discussion on the possibility of amending the minimum 60°C flashpoint requirement in SOLAS.

We are therefore mindful of the fact that fuels supplied to ships in 2020 will still need to meet a minimum flash point of 60°C and that fuels provided to the marine sector need to meet this SOLAS requirement to be commercially viable.

That said, the models used in MEPC 70/INF.6 to demonstrate sufficient refinery capacity for 2020 do mention blend components, including kerosene and naphtha, which can have a flashpoint well below 60°C. Unlike sulphur, where there is a linear relationship between the sulphur content in the different components and the final product, the relationship between flashpoint and the blend components is not linear. Even a small amount of a low flashpoint blend component could cause the resultant blend to be off-spec because the flashpoint is linked to the vapour created by volatile materials in the product, so caution is required when choosing blend components.

The general consensus in the market today is that refineries and other parties in the marine fuel supply chain are aware of the 60°C flashpoint limit and as such will take due care to ensure products offered to the marine fuels market comply with the SOLAS requirement.
Aside from the issue of flashpoint, as noted by Brazil in MSC 98/22/10, both IBIA and ISO raised concerns in submissions to MEPC 70 about the quality of fuel oil blends that are anticipated to enter the market to meet the 0.50% sulphur limit relating to stability and challenges regarding compatibility of various blends.

We would therefore support the opinion expressed by Brazil in document MSC 98/22/10 that MEPC should explore what preparatory and transitional measures may be taken to address any expected impact on fuel and machinery systems, as well as uncertainties surrounding potential safety concerns, to promote implementation of the 0.50% sulphur limit that is not just consistent and effective, but also safe.

MEPC 71 will consider a draft justification and scope for a 'new output' from PPR 4 on consistent implementation of the 0.50% sulphur limit. The draft scope already includes a note to consider the potential impact on fuel and machinery systems. Perhaps MSC could request MEPC to include a note in the scope to explore preparatory and transitional measures to address uncertainties surrounding potential safety concerns related to low sulphur fuel oils, and to keep MSC informed on this aspect of the implementation work."

Statement by the delegation of the Russian Federation

"The Russian seaports of Feodosiya, Kerch, Sevastopol, Yalta and Yevpatoriya, situated in the Crimean Peninsula, are open for all ships to call at and no administrative or any other restrictions are in effect.

This information has been already communicated to the IMO Member-States through the documents MSC 95/21/12, MSC 96/4/7 and MSC 97/4/3.

As a flag and port State the Russian Federation fulfils in good faith its obligations in the field of maritime safety and protection of the marine environment in the maritime areas adjacent to the Crimean Peninsula. In the seaports of Crimea a comprehensive system aimed at ensuring maritime safety and protection of the marine environment is in place. It comprises, inter alia, vessel traffic services (VTS), port State control of ships, the Global Maritime Distress and Safety System (GMDSS), ship reporting systems, ships' routeing, pilotage, shore-based automatic identification systems (AIS), long-range identification and tracking of ships (LRIT), navigational and hydrographic services and search and rescue.

Navigation and weather information for all sea ports and their approaches is transmitted to ships as provided for in the relevant international instruments."

"Российские порты Феодосия, Керчь, Севастополь, Ялта и Евпатория, расположенные на Крымском полуострове, открыты для заходов судов, в них отсутствуют административные и любые другие ограничения.

Ранее информация об этом доводилась до сведения государств-членов ИМО документами: MSC 95/21/12; MSC 96/4/7; MSC 97/4/3.

Россия в качестве государства флага и порта полностью обеспечивает выполнение своих международно-правовых обязательств в области безопасности морского судоходства и защиты морской среды в акваториях вокруг Крымского полуострова. В портах Крыма функционирует комплексная система обеспечения безопасности мореплавания и защиты морской среды от загрязнения, которая включает: системы

управления движением судов (СУДС); государственный портовый контроль судов; Глобальную морскую систему связи при бедствии и для обеспечения безопасности (ГМССБ); системы судовых сообщений; регулирование движения судов; лоцманскую проводку судов; береговые автоматические идентификационные системы; системы опознавания судов и слежения за ними на дальнем расстоянии (ОСДР); навигационно-гидрографическое обеспечение мореплавания, поиск и спасание и т.д.

Информация о навигационной и гидрометеорологической обстановке в портах и на подходах к ним передается мореплавателям, как это предусмотрено соответствующими международными документами."

Statement made by the delegation of Ukraine

"My delegation would like to exercise its right of reply with respect to the comments made by the delegation of the Russian Federation.

First, the delegation of Ukraine would like to draw the attention of this Committee to the fact that the attempted forceful annexation by Russia of Crimea is not recognized by the UN and its Member States. Besides, the United Nations confirmed the status of the Autonomous Republic of Crimea and the city of Sevastopol as an integral part of the territory of Ukraine and condemned the temporary occupation of Crimea by the Russian Federation.

The Russian occupation authorities have no legal grounds to implement IMO instruments in the temporarily occupied territory of the Autonomous Republic of Crimea and the city of Sevastopol, Ukraine. Attempts of the Russian Federation to comply with IMO conventions on an occupied territory cannot be regarded as proper implementation of IMO instruments and do not bear the legal consequences.

In line with UN General Assembly resolutions 68/262 of 27 March 2014 and 71/205 of 19 December 2016 Ukraine calls upon all states and international organizations to refrain from any actions that might be interpreted as recognizing the Russian Federation's continued unauthorized unilateral actions that prevent Ukraine from carrying out its international obligations in the maritime area appertaining to the Crimean Peninsula and undermine the sovereignty of Ukraine.

Second, I'd like to once again underline that due to continued illegal occupation by the Russian Federation of the Autonomous Republic of Crimea and the city of Sevastopol Ukraine has temporarily suspended the functioning of the maritime rescue sub-centres (MRSCs) in Kerch (LRIT ID 2791) and Sevastopol (LRIT ID 2793) until the complete restoration of constitutional law and order and effective control by Ukraine over the occupied territory.

The relevant information has been communicated to IMO Member States by means of document NCSR 4/INF.15 and was duly reflected in the Global SAR Plan module of the GISIS.

In addition, the delegation of Ukraine would like to draw the attention of the IMO Member States, as it was promulgated by the IMO circular GMDSS.1/Circ.21, that operation of GMDSS A1 Sea Area VHF DSC Coast Radio Stations situated in Kerch (UN/LOCODE – UAKEH) and Sevastopol (UASVP) has also been suspended.

Such situation complicates the procedures necessary to process the distress alerts and reduces capabilities (period of processing) with regard to operative response in the course of planning and carrying out SAR missions in the maritime areas adjacent to the Crimean Peninsula of Ukraine.

Third, the incident with Ukrainian rescue vessel, which took place on 23 April 2017, is just one appalling example of Russia's systematic campaign to turn the Northern part of the Black Sea into a "grey zone" for international shipping.

The Ukrainian Side will continue monitoring situation with the security and safety of navigation in this part of the Black Sea and notifying the IMO about any threats to it.

In particular, taking this opportunity, the delegation of Ukraine would like to express its strong protest with regard to another Russian armed provocation – firing on 1 February 2017 at the Ukrainian Navy An-26 transport aircraft, which conducted a training flight over Odessa gas field in the maritime exclusive economic zone of Ukraine.

The Ukrainian Side demands from the Russian Federation to stop its illicit activities against sovereignty and territorial integrity of Ukraine, including armed provocations in Ukraine's maritime exclusive economic zone, which bring upon international legal consequences to those involved, and to investigate the two above mentioned incidents and bring the perpetrators to justice.

Mr. Chair,

Finally, we would like to ask the Committee to note the information provided."

Statement made by the delegation of Malta

"Following the illegal annexation of the Autonomous Republic of Crimea and the city of Sevastapol by the Russian Federation, Malta, as a member of the European Union, remains firmly committed to Ukraine's sovereignty and territorial integrity.

Malta does not recognize the illegal annexation and we continue to condemn this violation of international law. It remains a direct challenge to international security, with grave implications for the international legal order that protects the unity and sovereignty of all states.

As a member of the European Union, we remain committed to fully implementing the non-recognition policy, including restrictive measures. UN Members States are once again called upon to consider similar non-recognition measures in line with the UNGA resolution 68/262."

Statement made by the delegation of Ukraine

"This delegation has a number of reservations with regard to paragraphs 22.38-22.41 on pages 52-53.

First, the title of paragraphs omits word "Ukraine" after the mentioning of the Autonomous Republic of Crimea and the city of Sevastopol that is not in line with the title of the information paper submitted by Ukraine. This could call into question the territorial integrity of my country that will be contrary to the relevant UN GA resolutions.

Second, paragraph 22.39 doesn't reflect the deliberations that took place during discussions in the plenary. The Committee decided to attach statements of the Russian Federation's delegation as well as delegations of Ukraine and Malta to the report of the Committee. But in fact the paragraph contains the indication of the substance of the statement only of the Russian Federation. In this connection we suggest either insert the indication of the substance of the statements by Ukraine and Malta or to paraphrase the first sentence in the following way: "in this context, the delegation of the Russian Federation made a statement as set out in annex".

Third, if this delegation recalls the discussion correctly, in contrast to other delegations who have expressed their association with the statement made by Malta, the delegation of Australia made a separate statement recognizing the closure of seaports in the Autonomous Republic of Crimea and the city of Sevastopol, supporting non-recognition of the Russian Federation's claim to implement IMO conventions on an occupied territory and to exercise control in this region as well as a withdrawal of port facility security plans in the closed seaports of Ukraine.

Fourth, the Russian Federation is attempting to mislead the Committee about the conclusion of MSC 97. The matter under discussion was not the territorial possession of Crimea but the particular draft Assembly resolution submitted by Georgia and Ukraine. As it was reflected in paragraph 4.11.3 of the Report of the MSC 97 the majority of the delegations that spoke expressed the view that IMO was not the appropriate forum for the development of the proposed resolution. But definitely we were not discussing the territorial possession of Crimea which could not be questioned within UN specialized institutions, IMO being one of those. And there was no decision as to limit ways in which the notification about threats to the security and safety of navigation could be made.

Consequently, this delegation proposes to make substance of the paragraph 22.41 about conclusion and decision that had been reached at MSC 97 more precise in order to avoid any misleading of IMO Member States. The other way out could be just to delete paragraph 22.41 completely as there is no need to start discussion on this matter again.

Moreover, to avoid any discussions on paragraphs 22.38-22.41 we would suggest that all statements will be included in annexes to the report which is usually the case. That will allow us to narrow the reflection of the discussion to just one paragraph 22.38 with attachment of all statements."