INTERNATIONAL MARITIME ORGANIZATION

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MARITIME SAFETY COMMITTEE
96th session
Agenda item 3

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CONSIDERATION AND ADOPTION OF AMENDMENTS TO MANDATORY INSTRUMENTS

Amendments to the introduction and part B of the International Code on Intact Stability, 2008 (2008 IS Code)

Note by the Secretariat

SUMMARY

Executive summary:	The Committee is invited to consider, with a view to adoption, draft amendments to the introduction and part B of the International Code on Intact Stability, 2008 (2008 IS Code)
Strategic direction:	5.2
High-level action:	5.2.1
Planned output:	5.2.1.24
Action to be taken:	Paragraph 5
Related documents:	Circular Letter No.3555; Circular Letter No.3599; SDC 2/25, paragraphs 7.7 and 7.8 and annexes 3 and 4; MSC 95/22, paragraph 10.10 and MSC 95/22/Add.2, annex 12

1 The Committee will recall that, at its ninety-fifth session, it approved the draft amendments to the introduction of the 2008 IS Code regarding vessels engaged in anchor-handling operations, set out in annexes 1 and 2.

2 The aforementioned draft amendments were circulated, in accordance with SOLAS article VIII(b)(i), for consideration with a view to adoption at MSC 96, to all IMO Members and Contracting Governments to the 1974 SOLAS Convention under cover of Circular Letter No.3555 of 21 August 2015.

3 In the context of the 1988 Load Lines Protocol, the aforementioned amendments were also circulated, in accordance with paragraph 2(a) of article VI of the 1988 Load Lines Protocol, to all IMO Members and Parties of the 1988 Load Lines Protocol under cover of Circular Letter No.3599 of 22 October 2015.

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4 The Committee will also recall that, at its ninety-fifth session, it approved, in principle, the draft amendments to part B (the provisions of which shall be treated as recommendatory) of the 2008 IS Code regarding vessels engaged in anchor-handling operations, set out in annex 3, for consideration with a view to adoption in conjunction with the adoption of the associated amendments to the introduction, in accordance with SOLAS regulation II-1/2.27.2 and 1988 Load Lines Protocol regulation I/3(16).2 concerning the procedure for amending part B of the 2008 IS Code.

Action requested of the Committee

5 The Committee is invited to consider for adoption:

.1 the draft amendments to the introduction of the 2008 IS Code, set out in annex 1, in accordance with article VIII(b)(iv) of the 1974 SOLAS Convention;

.2 the draft amendments to the introduction of the 2008 IS Code, set out in annex 2, in accordance with paragraph 2(d) of article VI of the 1988 Load Lines Protocol; and

.3 the draft amendments to part B of the 2008 IS Code, set out in annex 3, in accordance with SOLAS regulation II-1/2.27.2 and 1988 Load Lines Protocol regulation I/3(16).2.

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ANNEX 1

DRAFT RESOLUTION MSC.[…(96)]
(adopted on […])

AMENDMENTS TO THE INTRODUCTION 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"),

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 operations in the 2008 IS Code,

HAVING CONSIDERED, at its [ninety-sixth] session, the amendments to the introduction 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, amendments to the introduction of the 2008 IS 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 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 THE INTRODUCTION OF THE 2008 IS CODE

1 Purpose

1 The chapeau of paragraph 1.2 is amended to read as follows:

"1.2 This Code contains intact stability criteria for the following types of ships and other marine vehicles of 24 m in length and above as well as certain ship operations, unless otherwise stated:"

2 In paragraph 1.2, a new subparagraph .7 is inserted as follows:

".7 ships engaged in anchor handling operations;"

and the remaining subparagraphs are renumbered accordingly.

2 Definitions

3 A new paragraph 2.27 is inserted after the existing paragraph 2.26 as follows:

"2.27 *Ship engaged in anchor handling operations* means a ship engaged in operations with deployment, recovering and repositioning of anchors and the associated mooring lines of rigs or other vessels. Forces associated with anchor handling are generally associated with the winch line pull and may include vertical, transverse, and longitudinal forces applied at the towing point and over the stern roller."

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ANNEX 2

DRAFT RESOLUTION MSC.[…(96)]
(adopted on […])

AMENDMENTS TO THE INTRODUCTION 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"),

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 operations in the 2008 IS Code,

HAVING CONSIDERED, at its [ninety-sixth] session, amendments to the introduction 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, amendments to the introduction of the 2008 IS Code, 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

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1 Purpose

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ANNEX 3

DRAFT RESOLUTION MSC.[…(96)]
(adopted on […])

AMENDMENTS TO PART B 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"),

NOTING the provisions regarding the procedure for amendments to part B of the 2008 IS Code, stipulated in regulation II-1/2.27.2 of the International Convention for the Safety of Life at Sea, 1974 ("the SOLAS Convention"), as amended by resolution MSC.269(85), and in paragraph (16).2 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 operations in the 2008 IS Code,

HAVING CONSIDERED, at its [ninety-sixth] session, the proposed amendments to part B of the 2008 IS Code, prepared by the Sub-Committee on Ship Design and Construction, at its second session,

1 ADOPTS amendments to part B of the 2008 IS Code, the text of which is set out in the annex to the present resolution;

2 RECOMMENDS Governments concerned to use the amendments to part B of the 2008 IS Code as a basis for relevant safety standards, unless their national stability requirements provide at least an equivalent degree of safety;

3 INVITES Contracting Governments to the SOLAS Convention and Parties to the 1988 Load Lines Protocol to note that the above amendments to the 2008 IS Code will take effect on [1 January 2020].

ANNEX

AMENDMENTS TO PART B OF THE 2008 IS CODE

1 The title of part B is amended to read as follows:

"Part B
Recommendations for ships engaged in certain types of operations, certain types of ships and additional guidelines"

Chapter 1 – General

1.2 Application

2 A new paragraph 1.2.2 is inserted after the existing paragraph 1.2.1 as follows:

"1.2.2 The recommendations contained herein may also apply to other ships subject to similar external forces, when determining the adequacy of stability."

and the existing paragraphs 1.2.2 and 1.2.3 are renumbered accordingly.

Chapter 2 – Recommended design criteria for certain types of ships

3 A new section 2.7 is inserted as follows:

"**2.7 Ships engaged in anchor-handling operations**

2.7.1 Application

2.7.1.1 The provisions given hereunder apply to ships engaged in anchor-handling operations.

2.7.1.2 A *wire* means a dedicated line (wire rope, synthetic rope or chain cable) used for the handling of anchors by means of an anchor handling winch.

2.7.2 Heeling levers

2.7.2.1 A heeling lever, HL_{φ}, generated by the action of a heeling moment caused by the vertical and horizontal components of the tension applied to the wire should be calculated as:

$$HL_{\varphi} = (M_{AH} / \Delta_2) \cos \varphi$$

where:

M_{AH} = $F_p \bullet (h \sin \alpha \bullet \cos \beta + y \bullet \sin \beta)$;

Δ_2 = displacement of a loading condition, including action of the vertical loads added (F_v), at the centreline in the stern of ship;

F_v = $F_p \bullet \sin \beta$;

α = the horizontal angle between the centreline and the vector at which the wire tension is applied to the ship in the upright position, positive outboard;

β = the vertical angle between the waterplane and the vector at which the wire tension is applied to the ship, positive downwards, should be taken at the maximum heeling moment angle as:

= $tan^{-1}(y/(h \bullet sin\ \alpha))$; but not less than $cos^{-1}(1.5\ B_P/\ F_P\ cos\ \alpha)$, using consistent units;

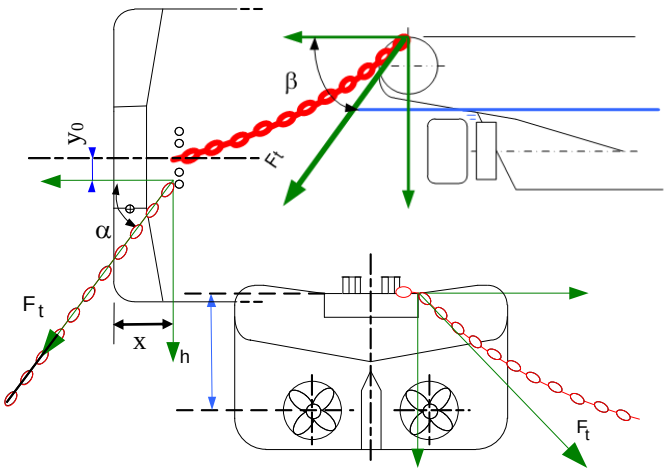

Figure 2.7.2 – Diagrams showing the intended meaning of parameters α, β, x, y and h. **F_t** ***shows the vector of the applied wire tension.***

B_P = the Bollard pull that is the documented maximum continuous pull obtained from a static pull test on sea trial, carried out in accordance with annex A of MSC/Circ.884 or an equivalent standard acceptable to the Administration;

F_p = (Permissible tension) the wire tension which can be applied to the vessel as loaded while working through a specified tow pin set, at each α, for which all stability criteria can be met. F_p should in no circumstance be taken as greater than F_d;

F_d = (Design maximum wire tension) the maximum winch wire pull or maximum static winch brake holding force, whichever is greater;

h = the vertical distance (m) from the centre the propulsive force acts on the ship to either:

- the uppermost part at the towing pin, or
- a point on a line defined between the highest point of the winch pay-out and the top of the stern or any physical restriction of the transverse wire movement;

y = the transverse distance (m) from the centreline to the outboard point at which the wire tension is applied to the ship given by:

$y_0 + x \tan \alpha$; but not greater than $B/2$;

B = the moulded breadth (m);

y_0 = the transverse distance (m) between the vessel centreline to the inner part of the towing pin or any physical restriction of the transverse wire movement;

x = the longitudinal distance (m) between the stern and the towing pin or any physical restriction of the transverse wire movement.

2.7.3 Permissible tension

2.7.3.1 The permissible tension as function of α, defined in paragraph 2.8.2, should not be greater than the tension given by paragraph 2.8.3.2,

2.7.3.2 Permissible tension as function of α can be calculated by direct stability calculations, provided that the following are met:

.1 the heeling lever should be taken as defined in paragraph 2.7.2 for each α;

.2 the stability criteria in paragraph 2.7.4, should be met;

.3 α should not be taken less than 5 degrees, except as permitted by paragraph 2.7.3.3; and

.4 Intervals of α should not be more than 5 degrees, except that larger intervals may be accepted, provided that the permissible tension is limited to the higher α by forming working sectors.

2.7.3.3 For the case of a planned operation to retrieve a stuck anchor in which the vessel is on station above the anchor and the vessel has low or no speed, α may be taken as less than 5 degrees.

2.7.4 Stability criteria

2.7.4.1 For the loading conditions intended for anchor-handling, but before commencing the operation, the stability criteria given in paragraph 2.2 of part A, or the equivalent stability criteria given in paragraph 2.4 of part B, where a vessel's characteristics render compliance with paragraph 2.2 of part A impracticable should apply. During operation, under the action of the heeling moment, the criteria under paragraphs 2.7.4.2 to 2.7.4.4 should apply.

2.7.4.2 The residual area between the righting lever curve and the heeling lever curve calculated in accordance with paragraph 2.7.2 should not be less than 0.070 metre-radians. The area is determined from the first intersection of the two curves, φ_e, to the angle of the second intersection, φ_c, or the angle of down-flooding, φ_f, whichever is less.

2.7.4.3 The maximum residual righting lever GZ between the righting lever curve and the heeling lever curve calculated in accordance with paragraph 2.7.2 should be at least 0.2 m.

2.7.4.4 The static angle at the first intersection, φ_e, between the righting lever curve and the heeling lever curve calculated in accordance with paragraph 2.7.2 should not be greater than:

.1 the angle at which the righting lever equals 50 per cent of the maximum righting lever;

.2 the deck edge immersion angle; or

.3 15^o,

whichever is less.

2.7.4.5 A minimum freeboard at stern, on centerline, of at least 0.005 L should be maintained in all operating conditions, with a displacement given by Δ_2, as defined in paragraph 2.7.2. In the case of the anchor retrieval operation covered by paragraph 2.7.3.3, a lower minimum freeboard may be accepted provided that due consideration has been given to this in the operation plan.

2.7.5 Constructional precautions against capsizing

2.7.5.1 A stability instrument may be used for determining the permissible tension and checking compliance with relevant stability criteria.

Two types of stability instrument may be used on board:

- either a software checking the intended or actual tension on the basis of the permissible tension curves; or

- a software performing direct stability calculations to check compliance with the relevant criteria, for a given loading condition (before application of the tension force), a given tension and a given wire position (defined by angles α and β)

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

2.7.5.3 The area of freeing ports in the side bulwarks of the cargo deck should at least meet the requirements of regulation 24 of the International Convention on Load Lines, 1966 or the Protocol of 1988 relating thereto, as amended, as applicable. The disposition of the freeing ports should be carefully considered to ensure the most effective drainage of water trapped in working deck and in recesses at the after end of the forecastle. In vessels operating in areas where icing is likely to occur, no shutters should be fitted in the freeing ports.

2.7.5.4 The winch systems should be provided with means of emergency release.

2.7.5.5 For vessels engaged in anchor-handling operations the following recommendations for the anchor-handling arrangements should be considered:

.1 stop pins or other design features meant to impede the movement of the wire further outboard should be installed; and

.2 the working deck should be marked with contrasting colours or other identifiers such as guide pins, stop pins or similar easily identifiable points that identify operational zones for the line to aid operator observation.

2.7.6 Operational procedures against capsizing

2.7.6.1 A comprehensive operational plan should be defined for each anchor-handling operation, according to the guidelines given in paragraph 3.8, where at least, but not only, the following procedures and emergency measures should be identified:

.1 environmental conditions for the operation;

.2 winch operations and movements of weights;

.3 compliancy with the stability criteria, for the different expected loading conditions;

.4 permissible tensions on the winches as function of α; in accordance with paragraph 3.8;

.5 stop work and corrective procedures; and

.6 confirmation of the master's duty to take corrective action when necessary.

2.7.6.2 The arrangement of cargo stowed on deck should be such as to avoid any obstruction of the freeing ports or sudden shift of cargo on deck.

2.7.6.3 Counter-ballasting to correct the list of the vessel during anchor-handling operations should be avoided."

Chapter 3 – Guidance in preparing stability information

3.4 Standard conditions of loading to be examined

3.4.1 Loading conditions

4 A new paragraph 3.4.1.7 is inserted as follows:

"Reserved (Towing Operations)"

5 A new paragraph 3.4.1.8 is inserted as follows:

"3.4.1.8 For a vessel engaged in an anchor-handling operation, the standard loading conditions should be as follows, in addition to the standard loading conditions for a cargo ship in paragraph 3.4.1.2:

.1 service loading condition at the maximum draft at which anchor-handling operations may occur with the heeling levers as defined in paragraph 2.8.2 for the line tension the vessel is capable of with a minimum of 67 % stores and fuel, in which all the relevant stability criteria as defined in paragraph 2.8.4 are met;

.2 service loading condition at the minimum draft at which anchor-handling operations may occur with the heeling levers as defined in paragraph 2.8.2 for the line tension the vessel is capable of with 10 % stores and fuel, in which all the relevant stability criteria as defined in paragraph 2.8.4 are met;"

3.4.2 Assumptions for calculating loading conditions

6 In paragraph 3.4.2.3, the following sentence is inserted at the end:

"If a vessel operates in zones where ice accretion is likely to occur, allowance for icing should be made in accordance with the provisions of chapter 6 (Icing considerations)."

7 Subparagraph 3.4.2.7.5 is deleted.

8 Subparagraph 3.4.2.8.2 is deleted and the remaining paragraphs are renumbered accordingly.

9 The following new paragraphs 3.4.2.9 to 3.4.2.11 are added as follows:

"3.4.2.9 For ships engaged in harbour, coastal or ocean going towing, escort towing, anchor-handling or lifting operations, allowance should be made for the anticipated weight of cargo on and below deck, chain in lockers, anticipated type of wire or rope on storage reels and wire on the winches when calculating loading conditions.

3.4.2.10 For ships engaged in anchor-handling operations, the compliance with the relevant stability criteria should be made for each set of towing pins and its associated permissible line tensions, including any physical element or arrangement that can restrict the line movement.

3.4.2.11 For ships engaged in anchor-handling operations, the reference loading conditions in paragraph 3.4.1.8 should meet the stability criteria in paragraph 2.8.4 when applying the design tension F_d, for the tow pin set nearest to centreline, as a minimum for the lowest α equal to 5 degrees."

3.5 Calculation of stability curves

10 A new section 3.5.4 is added as follows:

"**3.5.4 Calculation of stability curves for ships engaged in anchor-handling operations to which section 2.8 applies**

3.5.4.1. Curves (or tables) of the permissible tension as a function of permissible KG (or GM) are to be provided for the draught (or displacement) and trim values covering the intended anchor-handling operations. The curves (or tables) should be developed under the following assumptions:

.1 the maximum allowable KG from the approved stability booklet;

.2 information of permissible tension curve or table for each set of towing pins, including any physical element or arrangement that can restrict the line movement as function of the stability limiting curve should be included;

.3 where desirable, a permissible tension curve or table should be provided for any specific loading condition;

.4 the draught (or displacement), trim and KG (or GM) to be taken into consideration are those before application of the tension; and

.5 where tables are provided that divide the operational, cautionary, and stop work zones, referred to in paragraph 3.8.2 ("Green", "Yellow" or "Amber", "Red" colour codes, respectively) the limiting angles associated with physical features of the stern, including the roller, may be used to define the boundaries between the operational and cautionary zones (green/yellow boundary) and the cautionary and stop work zones (yellow/red boundary)."

3.6 Stability booklet

11 A new paragraph 3.6.3 is added as follows:

"3.6.3 The stability manual for ships engaged in anchor handling operations should contain additional information on:

.1 maximum bollard pull, winch pull capacity and brake holding force;

.2 details on the anchor-handling arrangement such as location of the fastening point of the wire, type and arrangement of towing pins, stern roller, all points or elements where the tension is applied to the ship;

.3 identification of critical downflooding openings;

.4 guidance on the permissible tensions for each mode of operation and for each set of towing pins, including any physical element or arrangement that can restrict the wire movement, as function of all relevant stability criteria; and

.5 recommendations on the use of roll reduction systems.

and the existing paragraphs 3.6.4 and 3.6.5 are renumbered as paragraphs 3.6.5 and 3.6.6 accordingly.

3.8 Operating booklets for certain ships

12 A new section 3.8 is added as follows:

"**3.8 Operational and planning manuals for ships engaged in anchor-handling for which section 2.8 applies:**

3.8.1 To assist the master an operational and planning manual containing guidelines for planning and performing specific operations should be provided on board. The guidelines should contain sufficient information to enable the master to plan and operate the ship in compliance with the applicable requirements contained in this Code. The following information should be included as appropriate:

.1 anchor- handling arrangements, including:

- detail arrangement of anchor handling deck equipment (winches, wire stoppers, towing pins, etc.);
- typical arrangement of cargo on deck (anchors, wires, chain cables, etc.);
- chain lockers used for mooring deployment;
- anchor-handling/towing winch;
- tugger winches;
- stern roller, including lateral limits on both ends;
- lifting appliances, if any and if forming a physical restriction as per paragraph 3.4.2.10; and
- typical paths of wires between winches and stern roller, showing the limit sectors; and

.2 detailed data of the permissible tensions, stability limiting curves, and recommendations for calculating ship's loading conditions including sample calculations.

3.8.2 An operation plan should be agreed to by the master of the vessel and a copy archived on a remote location before the operation commences. Guidelines and procedures to define a step-wise operational plan for a specific operation should contain instructions for:

.1 identifying and calculating loading conditions for all relevant stages of operation, taken into account the expected fuel and stores consumption, alterations on deck load, effects of deployment or recovering of the wire on the winches and chain lockers;

.2 planning ballast operations;

.3 defining the most favourable consumption sequence and identifying the most onerous situations;

.4 identifying the possibility or prohibition of using the roll reduction systems in all operational stages;

.5 operation with open chain lockers, e.g. additional loading conditions for asymmetric filling or other measures to reduce the possibility of flooding;

.6 collect updated weather forecasts, and to define environmental conditions for anchor handling operations;

.7 the use of limiting stability curves and intended tensions;

.8 defining the stop work limits:

.a permissible tensions and operational sectors for α;

.b heeling angles in compliance with the stability criteria; and

.c environmental conditions;

.9 implement and define corrective and emergency procedures;

.10 define:

.a an operational zone in which normal operations up to the permissible tension are to occur (i.e. a "Green" zone);

.b a cautionary zone (i.e., a "Yellow" or "Amber" zone) where operations may be reduced or halted to assess the ship's options to return to the operational or Green Zone: the cautionary zone should be not less than an angle of 10 degrees unless table 3.8.3 provides otherwise; and

.c a "Stop work" zone (i.e. a "Red" zone) in which the operation should be stopped, for which, in normal operations, the yellow/red boundary should not exceed 45 degrees or the point at which the wire rises above the deck. Notwithstanding this, due consideration may be given to different operations from typical anchor handling operations where the planned operation ensures the safety of the vessel; and

.11 examples of presentation of permissible tensions are presented in annex 3 to part B.

3.8.3 To aid the definition of permissible tensions and zones based on the availability of tension monitoring and an on board stability instrument the following table is provided.

Table 3.8.3

Availability of Tension Monitoring and an onboard Stability Instrument	Tension monitoring is not available	Tension monitoring is available but no stability instrument is available	Both tension monitoring and a stability instrument is available
Permissible tension, F_p	Design Maximum Line Tension, F_p, in the operational zone	F_p as described in Stability Booklet, the operational planning guidelines, or the specific operational plan.	F_p as calculated by the Stability Instrument for the actual loading condition
Permissible table	First α should be 5°. The only permissible tension is the Design maximum wire Tension, F_d. Figures in the table will be F_d for α for which $F_p \geq F_d$. The cautionary zone would include positions where $F_d > F_p \geq$ maximum winch wire pull. The stop work zone is every other position where $F_p <$ the maximum winch wire pull. If criteria is not fulfilled at α = 5° anchor handling should not be performed without winch modification.	Tables may be prepared for different values of draft, trim, KG or GM, or specific predefined loading conditions. Values in the table should range from α = 0 to α = 90º. A table should identify F_p at critical points and the table should be provided for each set of towing pins.	Tables or curves provided in the stability booklet may be used where F_p throughout the nonspecific operational zone exceeds the maximum anticipated wire tension; otherwise, tables or curves calculated for the actual loading condition must be developed.
Zones	The operational zone should be defined as the sector between the two outboard α values for which $F_p \geq F_d$. The cautionary zone should be defined as the sector between the α at which $F_p = F_d$ and α at which F_p = maximum winch wire pull.	The zones may be developed based on normal operational practices contained in the operational planning guidelines, e.g. the operational zone on the stern roller, cautionary zone for not more than 15deg past the stern roller and the red zone otherwise	The zones may be developed based on normal operational practices contained in the operational planning guidelines, e.g. the operational zone on the stern roller, cautionary zone for not more than 15deg past the stern roller and the red zone otherwise or

	The stop work zone should cover every other position. The sectors should be documented in the Stability Booklet, the operational planning guidelines, or the specific operational plan. The sector diagram may be prepared for multiple loading conditions. If the limiting α is less than 5° anchor handling operations should not be performed without winch modifications.	or developed for a specific operation where the outboard α values at which F_p = maximum anticipated wire tension minus 10º defines the operational zone, if α is greater than 20º. If this α is less than 20º, the operational zone is defined as the sector between ½ the outboard α values at which F_p = maximum anticipated wire tension. In each case, the cautionary zone is defined between the limit of the operational zone and the α value at which F_p = maximum anticipated wire tension. In each case, the operational zone must be identified for the anticipated wire tension.	developed for a specific operation where the outboard α values at which F_p = maximum anticipated wire tension minus 10º defines the operational zone, if α is greater than 20º. If this α is less than 20º, the operational zone is defined as the sector between ½ the outboard α values at which F_p = maximum anticipated wire tension. In each case, the cautionary zone is defined between the limit of the operational zone and the α value at which F_p = maximum anticipated wire tension. In each case, the operational zone must be identified for the anticipated wire tension.

"

and the existing section 3.8 is renumbered as section 3.9.

Chapter 4 – Stability calculations performed by stability instruments

4.1 Stability instruments

4.1.4 Functional requirements

13 A new paragraph 4.1.4.2 is added as follows:

"4.1.4.2 For ships engaged in anchor-handling operations planning tools should be provided in compliance with operational manual requirements. Information such as ballasting and consumables sequences, permissible tension, working sectors, heeling angles and use of roll-reduction devices should be stated."

and the remaining paragraphs are renumbered accordingly.

Part B – Annexes

14 A new annex 3 is added at the end of part B as follows:

"**Annex 3**

Recommended model for graphic or tabular presentation of permissible tensions for use in anchor handling operations.

The insertion of a recommended model for the presentation of permissible tensions as function of α might be beneficial for a universal information standard. This uniform presentation will facilitate the circulation and the familiarization of the operators with the ship and its equipment.

A possible graphic presentation of the permissible tension is here included as an example, both table and diagram format.

PERMISSIBLE WIRE TENSION TABLE FOR A SAMPLE AHTS

Trim (M)	-0.5	0.0	0.5	-0.5	0.0	0.5	-0.5	0.0	0.5	-0.5	0.0	0.5	-0.5	0.0	0.5	-0.5	0.0	0.5	-0.5	0.0	0.5
Angle α		0			10			20			30			45			60			90	
Draft (M)																					
Between the Centerline Towing Pins																					
4.8	700	700	700	700	700	690	625	580	540	460	460	435	290	290	290	190	190	190	165	165	165
5.8	700	700	700	700	700	690	655	600	550	430	485	435	285	285	310	190	180	200	170	165	170
6.8	700	635	520	700	635	520	645	575	510	550	485	415	355	355	305	230	240	220	200	205	200
Between the Outer Towing Pins																					
4.8	545	500	465	480	435	405	385	380	350	300	300	300	215	215	215	170	170	170	165	165	165
5.8	575	520	465	500	455	405	360	390	350	275	300	300	220	210	240	180	175	190	170	165	170
6.8	555	480	410	500	435	370	440	385	330	365	340	295	260	270	235	210	215	200	200	205	200
Towing Pin at the Edge of the Cargo Rail																					
4.8	280	280	270	260	260	260	235	235	235	215	215	215	180	180	180	170	170	170	160	160	160
5.8	255	290	280	240	260	265	230	235	250	210	200	235	190	180	200	175	170	180	165	160	165
6.8	345	310	270	320	300	260	290	285	245	260	270	230	220	230	210	205	210	200	195	200	195

Max Wire Pull: 600 t Max Brake Force: 700 t Max Dynamic Brake: 700 t Resulting Fd = 700 t

Trim is Negative by the bow. **Interpolate between drafts only. For trim between table values, use lower permissible tension.**	Permissible tensions shown are in Tonnes. Required tension should not exceed the winches capabilities or the values in the above table.
Table is for Planning and Monitoring AHTS operation. Specific loading conditions may be required for each anchor move.	If wire angle falls into the yellow zone, and wire tension exceeds the permissible value, corrective actions are required
Trim should be minimized or by bow for anchor moves where high wire tensions are expected.	If wire angle falls into the red zone, and the wire tension exceeds the permissible value, halt operations, reduce line tension
Wire angle (alpha α) is relative to vessel's centerline, and is assumed to always be outboard. If angle is exceeded, use next higher angle.	**If planned wire tension exceeds green values above, additional Calculations required. Operations should not be planned for high angles.**
Grey region indicates where the angle of tow wire is not geometrically possible. Permissible tensions are provided for reference only.	**Vessel loading must be in accordance with the approved stability book and include any assumed margins**

Figure 1: Permissible tension table for vessel with 3 tow points

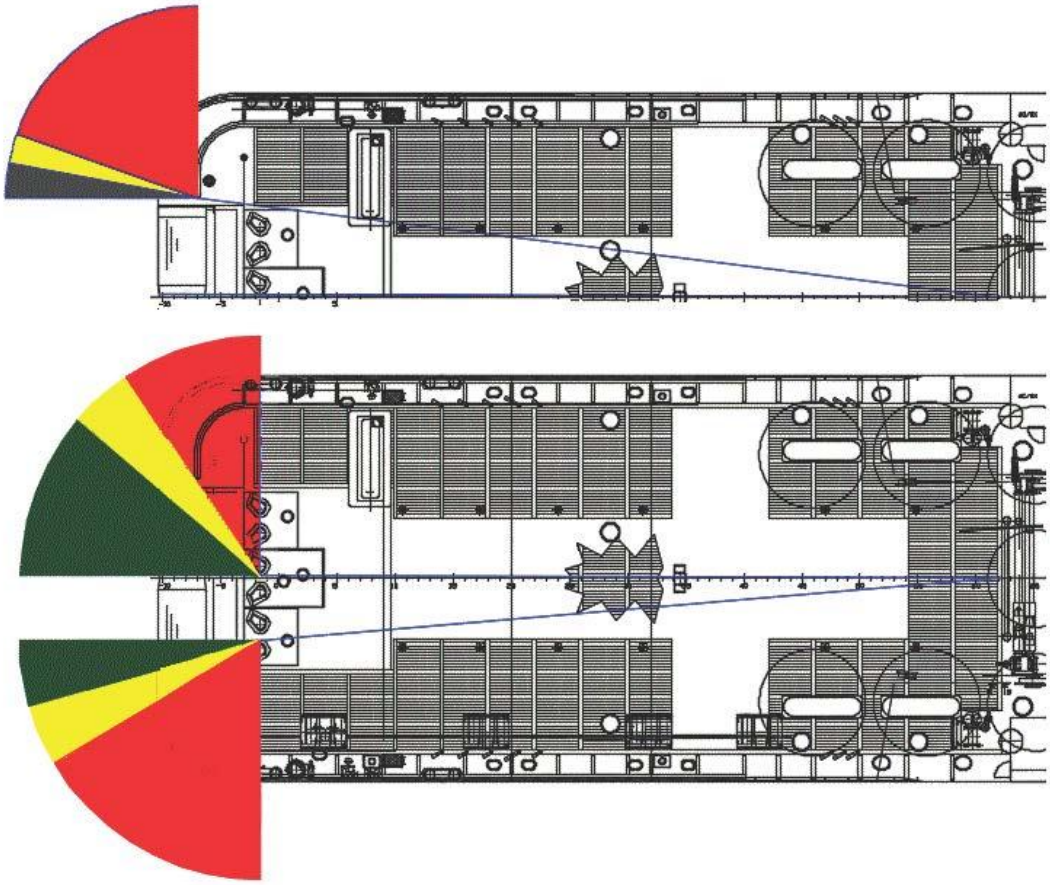

Figure 2: Illustration of the operational, cautionary, and stop work zones (coded respectively "Green", "Yellow" and "Red" zones)

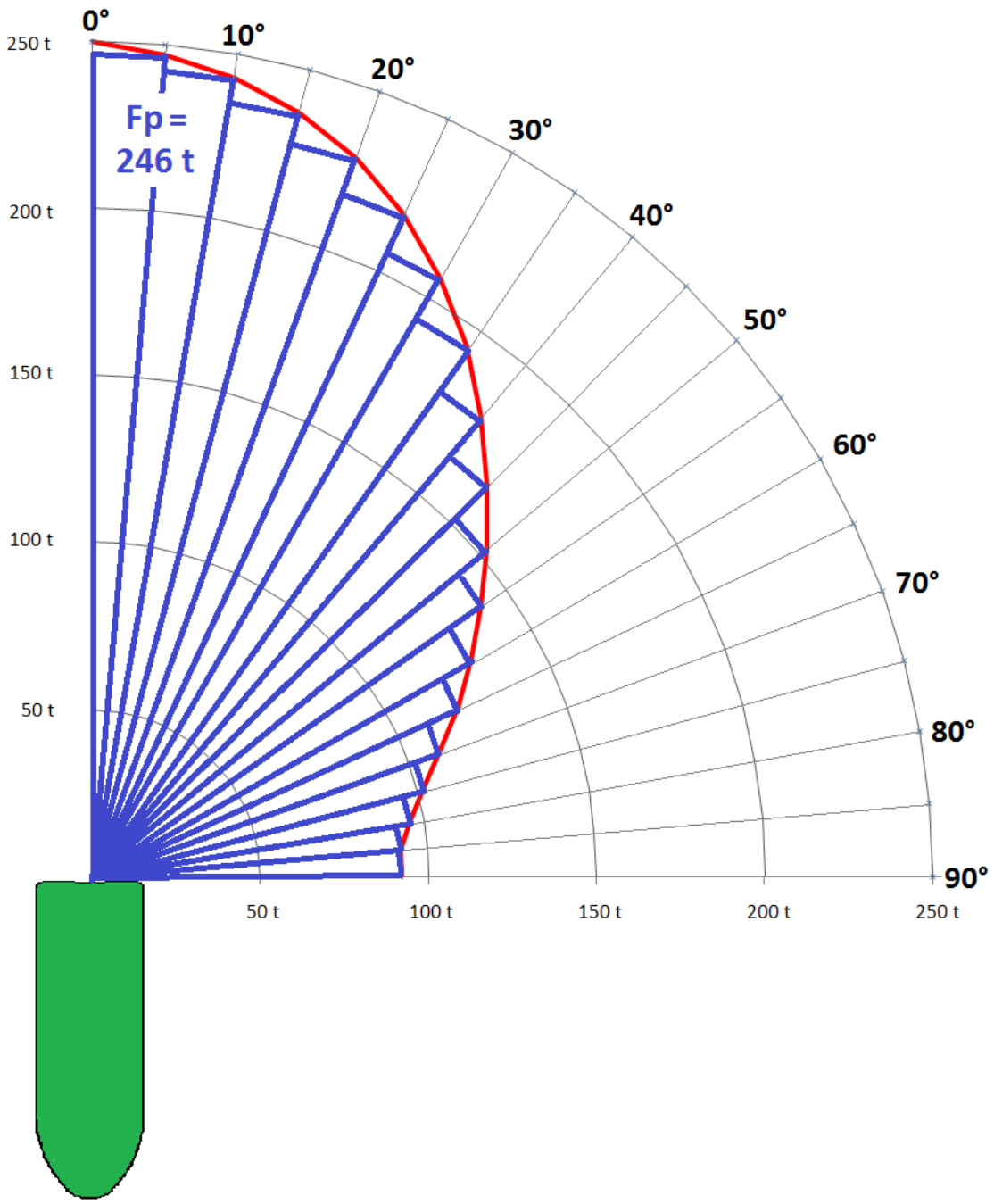

Figure 3: Permissible tension sector diagram based on standard alpha values (5°, 10°, 15°, 90°) "