



SUB-COMMITTEE ON STABILITY AND
LOAD LINES AND ON FISHING VESSELS
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Agenda item 5

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**DEVELOPMENT OF OPTIONS TO IMPROVE THE EFFECT OF THE
1969 TM CONVENTION ON SHIP DESIGN AND SAFETY**

Report of the correspondence group

Submitted by the United States

SUMMARY

Executive summary: This document provides the correspondence group's report on the work to further develop and finalize options to improve the effect on ship design and safety of the 1969 TM Convention

Strategic direction: 2

High-level action: 2.1.1

Planned output: 2.1.1.2

Action to be taken: Paragraph 8

Related documents: SLF 48/12; SLF 50/19, SLF 50/6/1; SLF 51/17, section 6, SLF 51/6, SLF 51/6/1; MSC 85/23/6 and Corr.1; STW 40/13/1, STW 40/14; STW 41/7/11, STW 41/16; SLF 52/5, SLF 52/5/1, SLF 52/5/2, SLF 52/5/3, SLF 52/19, section 5 and MSC 87/12

INTRODUCTION

1 At its fifty-second session, the Sub-Committee re-established the Correspondence Group on the 1969 TM Convention, under the coordination of the United States (terms of reference is described in paragraph 5.11 of document SLF 52/19).

2 Participants in the group included delegations from Member States (Australia, Canada, China, Denmark, France, Germany, India, Islamic Republic of Iran, Italy, Japan, Marshall Islands, Mexico, Netherlands, Norway, Panama, Republic of Korea, Spain, Sweden, United Kingdom and United States); a representative from the United Nations specialized agency (ILO); and observers from the non-governmental organizations (ICS, IACS, IFSMA, INTERTANKO and ITF).

3 This report describes the work done by the correspondence group as required under the terms of reference (see paragraph 1). In view of the target completion year of 2011 (as approved by MSC 81 and extended by MSC 85), the group included in its report a draft proposal for a non planned output to implement its single recommended option.

METHOD OF WORK

General

4 The group developed an action plan issued on 12 March 2010. The plan provided for three rounds of participant input and associated deadlines. A description of the work conducted during each round follows.

4.1 **Work description round 1 – Finalize options and variants:** This round involved four separate elements to gather information needed to further finalize the four options identified in annex 2 to document SLF 52/5/2, including identification of any variants to these options. These elements are described individually below. During this round, the finalization work was limited to option A (Improve Integrity/Uniform Application) and option B (Promote Net Tonnage), which had received the most support per annex 2 to document SLF 52/5/2:

- .1 **option A – Questionnaire:** The group developed and issued a questionnaire to collect additional information to justify implementing option A, for which the Sub-Committee expressed general agreement (SLF 52/19, paragraph 5.6; and MSC 87/12, paragraph 2.6). The group identified 28 separate issues for inclusion in this questionnaire for which specific text within the TM Convention or TM.5/Circ.5 requires interpretation, or which otherwise should be addressed when expanding or updating the information contained in TM.5/Circ.5;
- .2 **option B – Questionnaire:** The group developed and issued a questionnaire for option B (Promote Net Tonnage). This questionnaire focused on identifying specific points to be offered in support of this option, with the view to develop a circular or resolution to promote use of the net tonnage parameter;
- .3 **identification of variants:** The group was invited to identify any variants of the existing options, including options C (New Net Tonnage Parameter) and D (Maritime Real Estate), that would address deck cargo and crew accommodation concerns, per discussions in plenary at the fifty-second session of the Sub-Committee and the terms of reference (paragraphs 1.1 and 1.2 above); and
- .4 **rules and interpretations:** The group was invited to circulate copies of rules or interpretations which governments or organizations have developed and/or published.

4.2 **Work description round 2 – Evaluate options and variants:** The group was invited to offer general comments on the options and variants under consideration; proposed approaches to implementing the options or variants; thoughts on additional questionnaires to address the variants; and proposed formats for comparison of options and variants. Identification of benefits and disadvantages of each option and variant was included in the round 2 work. Based on the input received, the group developed an additional questionnaire addressing all options and variants, which was circulated to the group.

4.3 **Work description round 3 – Develop report to SLF 53:** During this round, the report to the Sub-Committee was developed and finalized. The coordinator developed and issued an initial draft report, with a three week comment period, which included a draft justification for an unplanned output to implement option A. After incorporating or otherwise resolving the comments, the coordinator issued a second draft report, with again, a three-week comment period. These comments were incorporated or similarly resolved when developing the final version of the report.

Correspondence Group on the 1969 TM Convention website

5 To facilitate exchange of information, the group created a website (www.uscg.mil/imo/slf/tonnagecg), incorporating elements of websites that have been used by the SLF Fishing Vessel Safety and Subdivision and Damage Stability correspondence groups. The group agreed not to post individual responses, in order to ensure comments were not taken out of context and to facilitate more open discussion on a topic involving subjectivity due to its complex nature. Instead, responses and summaries of responses were posted without specific attribution. In deference to privacy concerns, detailed information on participants (e.g., phone numbers and email addresses) was made available on the website only through a document which was protected by a password.

RESULTS OBTAINED BY THE GROUP

6 A discussion of the results obtained by the group follows:

6.1 **Results for round 1 – Finalize options and variants:** Nine participants representing six Member States and three non-governmental organizations provided input during this round. The results are summarized below:

.1 **option A:** Various degrees of support were expressed for the need for, and impact of, the 28 issues addressed in the questionnaires. There was reasonably broad consensus that:

- .1 for seven of the issues, the impact on the gross and/or net tonnage assignments of affected ships was moderate to high;
- .2 for six of the issues, the effect on ship design, safety, and/or crew accommodation on ships of various types was large; and
- .3 for 11 of the issues, the overall importance of resolving the issue was moderate to high.

In addition, several issues that were not the subject of the option A questionnaire were identified at the conclusion of the round 1 work. Per the subsequent agreement of the group, the group's report is addressing one of these additional issues along with the 28 issues addressed in the questionnaires, bringing the total issues addressed in this report to 29.

.2 **option B:** Overall, consensus was lacking regarding the extent to which net tonnage was used for tonnage duties and customs and harbour fees, as well as its usage for assessing corporate income taxes and ship registration size limits. There was moderate to broad consensus that a circular or resolution, if developed, should highlight the fact that net tonnage:

- .1 reflects cargo spaces and number of passengers;
- .2 is used in assessing corporate income taxes and tonnage-based fees;
- .3 cannot be less than 0.3 times the gross tonnage; and
- .4 generally does not penalize crew space.

There was moderate consensus that any circular or resolution should be issued at the Assembly level. There was little consensus that net tonnage should be promoted on the basis of improving ship safety through higher freeboards.

- .3 **consideration of variants:** The group identified two variants for further evaluation, both of which were associated with option D (Maritime Real Estate (GTMRE) parameter). The first variant, labelled D1, is an alternate net tonnage parameter (NTDWT) based on deadweight tonnage volume which could be used when NTDWT exceeds the value of the existing net tonnage parameter. NTDWT is calculated by substituting the volume corresponding to the deadweight tonnage for the cargo volume (V_c) in the existing NT formula. The second variant, labelled D2, is a third tonnage parameter (GTCbMRE) similar to GTMRE. GTCbMRE is calculated in the same manner as GTMRE, except that the formula includes the ship's block coefficient (C_b) and a coefficient based on the ship's type.
- .4 **rules and interpretations:** Several participants noted that related rules or interpretations had been issued, but unrestricted release of this material was authorized only in two cases. The releasable material was posted on the group's website.

6.2 **Results for round 2 – Evaluate options and variants:** 12 participants representing nine Member States and three non-governmental organizations provided input during this round. The results are summarized below:

- .1 **overall assessment summary:** Annex 1 presents the group's overall assessment of the options provided in annex 2 to document SLF 52/5/2, and associated variants, as finalized by the group. The scores are compiled from questionnaire responses. The rankings are based on these scores, along with comments of group participants. One participant suggested that the group's final report include a draft justification for an unplanned output for option A involving three sessions of the Sub-Committee, based on the support for this option expressed in the round 1 questionnaires. Another participant commented that the work could be accomplished through a future correspondence group, and then finalized using a working group at a subsequent session of the Sub-Committee;
- .2 **benefits and disadvantages:** Annex 2 to this report provides a detailed description of each option and variant, as finalized by the group, and lists associated benefits and disadvantages identified during rounds 1 and 2, or otherwise obtained from existing SLF documents (e.g., SLF 52/5/2 and SLF 52/19). The annex reflects the group's conclusion that, in the context of the terms of reference (paragraph 1.3 above), the word "benefit" does not have the same meaning as the word "advantage", and that the Sub-Committee was seeking an examination of the options in an absolute sense (looking at each option on its own merits), rather than in a relative sense (evaluating each option in comparison to other options);
- .3 **crew accommodation and deck cargoes:** These issues were examined with respect to each option and variant via the questionnaire, and were the subject of many comments. In general, the group found that while implementing option A could potentially address the differences in gross tonnage assignments between open-top and closed containership designs,

this approach would not address other concerns related to deck cargoes, nor would it encourage larger crew accommodation spaces. The group also found that while other options or variants were attractive to varying degrees as a means of addressing both crew accommodation and deck cargo concerns, there were a number of significant disadvantages to these other approaches, as identified in annex 2 to this report; and

.4 **general comments:** General comments and concerns identified by the group during this round are summarized as follows:

.1 **combining/recategorizing options and variants:** Various opinions were expressed over the viability of combining and/or recategorizing options and variants, or elements thereof, to arrive at more workable solutions. Suggestions along these lines included the following: 1) combining option C and variant D1; 2) applying option A in combination with option B only; 3) applying option A in combination with option B and/or variant D1 (but not option C); and 4) categorizing variant D2 as a variant of option A. Due to the lack of time and in keeping with its terms of reference, the group focused on identifying the overall viability of each individual option and variant, and did not pursue the proposed additional work in this regard;

.2 **implementation considerations:** A number of participants commented on the importance of practical obstacles to implementation of any approaches that might otherwise appear attractive from a theoretical standpoint. The principal comments in this regard are summarized as follows:

.1 **cost issues:** One participant stressed the importance of taking into consideration the cost of calculating new tonnage parameters (particularly for current ships) and/or reissuing International Tonnage Certificates in implementing any proposed approach. Another participant cited the reluctance on the part of shipowners to elect to have optional tonnage parameters assigned if their use for assessing tonnage-based fees results in increased costs: they will simply chose whatever parameter yields the lowest costs. Participants generally noted that shipping interests will actively oppose mandatory implementation of any new parameter if it will lead to increased fees;

.2 **importance of gross tonnage parameter:** One participant commented on the difficulty of changing from a system that is predominantly gross tonnage based to any other system, unless there is a strong correlation between gross tonnage and the new parameter. The participant further noted that, because the relationship between gross tonnage and net tonnage varies with the type of ship, there would be practical difficulties for port authorities to change to a net tonnage based system. Another participant commented that unless there is a fundamental change away from the use of gross tonnage for so many purposes, there is no way forward that will ensure decent crew and trainee accommodations; and

- .3 **amendment to the Convention:** A number of participants cited implementation concerns with any option requiring amendment to the TM Convention, due to length and difficulty of the amendment process. One participant commented that the tedious amendment process should not divert attention to a less effective solution, and instead the focus should be on root causes: if amendment to the Convention is needed for a permanent solution, wider acceptance and uniform application, than amending the Convention should be pursued; and
- .3 **separation of work programme issues:** One participant expressed the view that port States and other entities respect the integrity of the International Tonnage Certificate, and that there was general support within the group to ensure the integrity and uniform implementation of the existing gross tonnage (overall size) and net tonnage (useful capacity) volumetric parameters, affirming the need to keep the measurement system up-to-date (option A). The participant suggested that this important work be separated from other work related to the use by port Authorities of gross tonnage, as opposed to net tonnage, for assessing fees.

6.3 **Results for round 3 – Develop report to SLF 53:** The group drafted and finalized its report to the Sub-Committee. Based on the considerable support expressed within the group for option A, the group developed: 1) a draft justification for an unplanned output to implement this option for possible use by the Sub-Committee; and 2) a listing of the 29 option A issues identified in round 1 that require interpretation or otherwise need resolution, recognizing that the listing is not comprehensive. These documents are included as annexes 3 and 4, respectively. There was not sufficient time to decide on which approach for implementing option A was preferred by the group (e.g., an unplanned output vs. extension of the target completion year), or to fully review and discuss the language in annexes 3 and 4.

CONCLUSIONS

7 The group concluded that of the four options and two variants examined under its terms of reference, option A (Improve Integrity/Uniform Application) is the best option to address the ship design and safety concerns behind this planned output without risk of unintended consequences, and should be implemented.

ACTION REQUESTED OF THE SUB-COMMITTEE

8 The Sub-Committee is invited to consider the information provided in this report, and take action as appropriate, and in particular to:

- .1 endorse the conclusions of the group as described in paragraph 7 that option A (Improve Integrity/Uniform Application) is the single option that warrants implementation; and
- .2 determine an approach to implementing option A (i.e., an unplanned output vs. extension of the target completion year), taking into account the draft proposal set out in annex 3, if the Sub-Committee agrees that option A implementation should proceed without further delay.

ANNEX 1

OVERALL ASSESSMENT SUMMARY

Option A – Ensure integrity and uniform implementation of existing gross tonnage (GT) and net tonnage (NT) parameters		
Ranking	Scores	Description of option/variant
1	8 Strongly favour 1 Favour 3 Neutral	Expand and strengthen the recommendatory interpretations of the Interpretations of the Provisions of the International Convention on Tonnage Measurement of Ships, 1969 (TM.5/Circ.5). Identify any associated amendments to the TM Convention along with implementation approaches.
Option B – Promote use of existing net tonnage (NT) parameter		
Ranking	Scores	Description of option/variant
2	1 Strongly favour 4 Favour 5 Neutral 2 Disfavour	Promote use of the existing NT parameter through issuance of a circular or resolution.
Option C – Establish a new tonnage parameter: adjusted net tonnage (NT_{Adj})		
Ranking	Scores	Description of option/variant
6	1 Favour 1 Neutral 6 Disfavour 4 Strongly disfavour	Establish a new third tonnage parameter, NT _{Adj} , that reflects the volume of deck cargo.
Option D – Establish a new tonnage parameter: maritime real estate gross tonnage (GT_{MRE})		
Ranking	Scores	Description of option/variant
4	1 Strongly favour 2 Favour 1 Neutral 8 Strongly disfavour	Establish a new third tonnage parameter, GT _{MRE} , based on the ship's actual maritime real estate (product of the length, breadth, draught, and a single gross tonnage conversion factor derived from ships of all types).
Variant D1 – Establish an alternate tonnage parameter: deadweight net tonnage (NT_{DWT})		
Ranking	Scores	Description of Option/Variant
3	4 Favour 3 Disfavour 5 Strongly disfavour	Establish an alternate net tonnage parameter, NT _{DWT} , based on deadweight tonnage volume, which could be used when NT _{DWT} exceeds the value of the existing net tonnage parameter (NT). NT _{DWT} is calculated by substituting the volume corresponding to the deadweight tonnage for the cargo volume (V _c) in the existing NT formula.
Variant D2 – Establish a new tonnage parameter: block coefficient maritime real estate gross tonnage GT_{CbMRE}		
Ranking	Scores	Description of option/variant
5	1 Strongly favour 1 Favour 1 Neutral 3 Disfavour 6 Strongly disfavour	Establish a new third tonnage parameter, GT _{CbMRE} , based on the ship's block coefficient maritime real estate (product of the length, breadth, draught, block coefficient (C _b) and a gross tonnage conversion factor derived from ships of the same type).

ANNEX 2

BENEFITS AND DISADVANTAGES SUMMARY

Option A – Ensure integrity and uniform implementation of existing gross tonnage (GT) and net tonnage (NT) parameters

This option seeks to ensure the integrity and uniform implementation of the existing GT (overall size) and net tonnage NT (useful capacity) volumetric parameters, by expanding and strengthening the interpretations of Tonnage Measurement (TM.5/Circ.5). It includes a review of treatment of semi-open spaces which cause the tonnage disparities between containerships of open and closed designs, as well as treatment of deck cargo. Under this option, possible amendments to the TM Convention related to the existing GT and NT parameters are identified and further developed, as necessary, along with appropriate approaches for their implementation (e.g., unanimous acceptance vs. diplomatic conference).

Benefits	Disadvantages
<ol style="list-style-type: none"> 1 Improves ship design by allowing greater flexibility in meeting the tonnage rules through development of alternative approaches to existing interpretations (e.g., may reduce or eliminate tonnage disincentives for open-top containerships). 2 Improves ship safety by helping to ensure ships are regulated to the appropriate size-based ship safety, crew accommodation, security and environmental protection standards. 3 Provides an opportunity for a comprehensive review of the rules of the TM Convention, which has not been undertaken since it entered into force in 1969. 4 Establishes a mechanism to systematically identify gaps for which amendments to the Convention may be deemed necessary, and to evaluate implementation approaches. 5 Facilitates international commerce through consistent application of the TM Convention by avoiding uncertainties in tonnage assignments when ships change flag, and provides for more consistent port State control actions. 	<ol style="list-style-type: none"> 1 Relies on voluntary implementation of interpretations by flag States, over which IMO has no control. 2 Does not remove the incentive to minimize the size of crew accommodation spaces in order to reduce GT, for all ship types. 3 Only partially addresses the underlying deck cargo concerns (e.g., the tonnage disincentive for carrying cargo in fully enclosed spaces remains, as is typically the case for ro-ro ships).

Option B – Promote use of the existing net tonnage (NT) parameter

This option seeks to promote use of the existing NT parameter, *in lieu* of gross tonnage (GT), as the basis for assessing fees. NT is calculated using the ship's cargo space volume, number of passengers, and the ship's draft to depth ratio, but in no case may NT be less than 0.3 GT. Implementation of this option can be accomplished through issuance of an IMO circular or resolution at the appropriate level.

Benefits	Disadvantages
<ol style="list-style-type: none"> 1 Facilitates the incorporation of larger crew accommodation spaces and other beneficial non-revenue spaces (such as pollution control spaces) for many cargo ship designs. 2 Encourages the design of ships of all kinds with greater freeboards (higher depth to draft ratios) that are, arguably, safer, due to favourable treatment under the NT formula. 	<ol style="list-style-type: none"> 1 Relies on voluntary implementation of NT as the basis for assessing fees, over which IMO has no control. 2 Could drive designs in the direction of excessively high freeboards, leading to ungainly ships with excessive wind profiles that are difficult to steer. 3 Does not remove the incentive to minimize the size of crew accommodation spaces for some ship types (e.g., towing vessels), where the NT is "capped" at 0.3 GT.

Option C – Establish a new tonnage parameter: adjusted net tonnage (NT_{Adj})

This option seeks to establish a new net tonnage parameter, adjusted net tonnage (NT_{Adj}), that reflects the volume of deck cargo and would be used as the basis for assessing fees. NT_{Adj} is calculated by summing the maximum volume that will be occupied by deck cargo loads and the total volume of all enclosed cargo spaces (V_c), and entering that sum into the existing net tonnage formula. Under this option, the method of calculating gross tonnage is unchanged (i.e., deck cargo volume remains "exempt" from GT).

Benefits	Disadvantages
<ol style="list-style-type: none"> 1 Facilitates the incorporation of larger enclosed cargo spaces, thereby avoiding undesirable design features such as reduced freeboards and excess deck cargo that are driven by the desire to minimize the ship's GT or NT. 	<ol style="list-style-type: none"> 1 Relies on voluntary implementation of NT_{Adj} as the basis for assessing fees, over which IMO has no control. 2 Involves difficult and complex calculations to establish the maximum volume associated with deck cargo loads. This can be problematic even for containerships, and is especially so for specialized ships such as heavy lift ships, hopper barges, and timber carriers. 3 Introduces confusion and potential compliance difficulties arising from the owner's incentive to frequently change the NT_{Adj} assignment for certain ships where deck cargo loads vary. 4 Does not remove the incentive to minimize the size of crew accommodation spaces for some ship types (e.g., towing vessels), where the NT is "capped" at 0.3 GT.

<p>Option D – Establish a new tonnage parameter: maritime real estate gross tonnage (GT_{MRE})</p> <p>This option seeks to establish an alternative parameter to GT or NT for use in assessing fees. The alternate parameter, referred to as GT_{MRE}, is based on the ship's actual maritime real estate (i.e., volume of length x breadth x draught), modified by a factor such that the total aggregate GT_{MRE} tonnage of the world's shipping approximately equals the total aggregate GT of the world's shipping. GT_{MRE} effectively excludes the volume of all parts of the ship (freeboard, superstructures, deckhouses, hatches, sheer, etc.) above the summer waterline that are included in GT.</p>	
Benefits	Disadvantages
<ol style="list-style-type: none"> 1 Facilitates the incorporation of larger enclosed cargo spaces, thereby avoiding undesirable design features such as reduced freeboards and excess deck cargo that are driven by the desire to avoid high fees based on GT. 2 Facilitates the incorporation of larger crew accommodation spaces and other beneficial non-revenue spaces (such as pollution control spaces). 	<ol style="list-style-type: none"> 1 Relies on voluntary implementation of GT_{MRE} as a basis for assessing fees, over which IMO has no control. 2 Encourages high block coefficients and ungainly ship proportions that may be detrimental to safety in terms of maneuverability, seakeeping, efficiency, and crew comfort/fatigue. 3 Disfavours multi-hull ships and similar craft with large breadth measurements. 4 Provides an incentive to minimize full load displacement (draught), which could lead to reduced scantlings, removal of ballast, and otherwise adversely affect ship design and safety (including crew comfort/fatigue).

<p>Variant D1 – Establish an alternate tonnage parameter: deadweight net tonnage (NT_{DWT})</p> <p>This option seeks to establish an alternate net tonnage parameter reflective of a ship's "seawater equivalent net tonnage" with the recommendation that fees be assessed using the larger of: 1) the alternate parameter, or 2) the existing net tonnage parameter. The alternate parameter, referred to as NT_{DWT}, is calculated by substituting the volume associated with the ship's deadweight tonnage (expressed in metric tons of seawater) for the total volume of all cargo spaces (V_c) in the existing net tonnage formula. For some types of ships, especially specialized ships like dockships which carry large volumes of above-deck cargo relative to hull/superstructure volume, NT_{DWT} may yield higher tonnages than the current parameter.</p>	
Benefits	Disadvantages
<ol style="list-style-type: none"> 1 Facilitates the incorporation of larger enclosed cargo spaces, thereby avoiding undesirable design features such as reduced freeboards and excess deck cargo that are driven by the desire to minimize the ship's GT or NT for some cargo ship designs. 	<ol style="list-style-type: none"> 1 Relies on voluntary implementation of NT_{DWT} as a basis for assessing fees, over which IMO has no control. 2 Involves conversion of a weight parameter into a volumetric parameter, which is confusing conceptually to some and could compound the difficulty of achieving acceptance of NT_{DWT}.

<p>2 Facilitates the provision of larger crew accommodation spaces and other beneficial non-revenue spaces (such as pollution control spaces) for some cargo ship designs.</p>	<p>3. Only partially addresses the underlying deck cargo concerns (e.g., one participant reported that in no case did the NT_{DWT} exceed the NT in looking at examples of open-top containerships, closed containerships, ConRo's and offshore supply vessels).</p> <p>4. Does not remove the incentive to minimize the size of crew accommodation spaces for some ship types (e.g., towing vessels) where the NT is "capped" at 0.3 GT.</p>
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Variant D2 – Establish a new tonnage parameter: block coefficient maritime real estate gross tonnage GT_{CbMRE}

This option seeks to establish an alternative parameter to gross or net tonnage for use in assessing fees. The alternate parameter, referred to as GT_{CbMRE}, is based on the ship's actual maritime real estate (i.e., volume of length x breadth x draught) modified by both the ship's block coefficient (C_b) and a conversion factor calculated using maritime real estate values, block coefficients and gross tonnages for existing ships of a similar type. It would be assigned to new ships as an alternate for the GT parameter: current ships would not be assigned GT_{CbMRE}. Use of this parameter for assessing fees would lessen the gross tonnage "penalty" for the volume associated with larger crew accommodation spaces and enclosed cargo spaces (which in turn drive designs to favour larger deck cargo loads).

Benefits	Disadvantages
<p>1 Facilitates the incorporation of larger enclosed cargo spaces, thereby avoiding undesirable design features such as reduced freeboards and excess deck cargo that are driven by the desire to avoid high fees based on GT.</p> <p>2 Facilitates the incorporation of larger crew accommodation spaces and other beneficial non-revenue spaces (such as pollution control spaces).</p>	<p>1 Relies on voluntary implementation of GT_{CbMRE} as a basis for assessing fees, over which IMO has no control.</p> <p>2 Discourages certain novel designs (e.g., some high speed craft designs with large breadth measurements).</p> <p>3 Provides an incentive to minimize full load displacement (draught), which could lead to reduced scantlings, removal of ballast, and otherwise adversely affect ship design and safety (including crew comfort/fatigue).</p> <p>4 Involves classification of ships by type, which is inherently problematic (e.g., must establish precise definitions of ship type, difficult to categorize multi-service ships, change of ship service could lead to large tonnage change).</p> <p>5 Introduces constraints on future ship designs by "locking-in" tonnage conversion factors based on drafts and other characteristics of existing ship designs.</p>

ANNEX 3

JUSTIFICATION FOR A NEW UNPLANNED OUTPUT (in accordance with document SLF 53/5)

ENSURE THE INTEGRITY AND UNIFORM IMPLEMENTATION OF THE EXISTING GROSS AND NET TONNAGE PARAMETERS

Scope of the proposal

1 Under this proposal, the SLF Sub-Committee is tasked with updating, expanding and strengthening the interpretations contained in the Interpretations of the provisions of the International Convention on Tonnage Measurement of Ships, 1969 (TM.5/Circ.5) to ensure the integrity and uniform implementation of the gross tonnage and net tonnage parameters. This work includes a review of the treatment of semi-open spaces such as those within open-top containerships, and other interpretations related to deck cargo. In conjunction with this work, the SLF Sub-Committee is to identify any changes to the 1969 Tonnage Measurement (TM) Convention that are considered necessary to ensure the integrity and uniform implementation of the gross tonnage and net tonnage parameters, along with associated recommended approaches to amending the Convention.

Compelling need

2 The need for this new unplanned output stems from work performed by the SLF Sub-Committee between 2006 and 2011 under the work programme item "Development of Options to Improve the Design and Safety of the 1969 TM Convention", which was assigned a high priority by the Maritime Safety Committee (MSC 81/25). The Sub-Committee developed this new proposed programme item as the best option, and identified a number of specific issues for which there was a need to establish or update interpretations of the TM Convention rules (SLF 53/5, annex 4). These issues include the disparate treatment of open-top containerships designs as opposed to conventional designs of similar cargo capacity, which underlies the original work programme item, and related issues associated with deck cargo loads. There is a compelling need for this new output, because of the widespread use of the gross and net tonnage parameters in applying important safety and other regulatory breakpoints and assessing taxes and other fees, coupled with gaps in interpretations created by the continuing evolution of ship designs since updated interpretations were last published in TM.5/Circ.5 in 1994.

Analysis of the issues involved, having regard to the costs to the maritime industry and global legislative and administrative burdens

3 Under this proposal, the interpretations of TM.5/Circ.5, which are recommendatory in nature, will be updated. As such, it will be up to each Administration as to the extent that these interpretations will be made binding, for current and future ships, and it is likely that most, if not all, of the recommended changes to the interpretations will not be retroactive, unless requested by the ship's owner and agreed to by the Administration. Should this unplanned output lead to the eventual implementation of amendments to the TM Convention that impose additional binding requirements, the cost of administrative or legal burden will be the same as for any implementation of amendments to IMO instruments.

Benefits which would accrue from the proposal

4 Benefits include the following:

- .1 **consistency of application:** As indicated in its preamble, the aim of the TM Convention is to "establish uniform principles and rules with respect to the determination of tonnage of ships engaged on international voyages". This work will further that aim, through the updating of non-binding interpretations, and identification of gaps where changes to existing requirements may be needed through amendment to the Convention. Consistent application of the Convention will help facilitate international commerce, avoiding uncertainties in tonnage assignments when ships change flag, and providing for more consistent port State control actions;
- .2 **improved ship design:** Development of alternative approaches to existing interpretations may provide designers with greater flexibility in meeting the tonnage rules, resulting in less impact on ship design (e.g., reducing or eliminating tonnage disincentives for open-top containerships);
- .3 **improved ship safety:** Many international standards related to ship safety (of which crew accommodation, security and environmental protection standards are considered a part in this context) are applied based on parameters determined under the Convention, including a ship's gross tonnage. Maintaining the integrity of these, and related, parameters by closing potential loopholes in the rules will ensure ships conform to the appropriate size-based standards, thereby positively affecting ship safety. Safety improvements may also result from development and adoption of acceptable alternate measurement approaches that permit design features which enhance ship safety; and
- .4 **systematic approach to identifying amendments:** A comprehensive review of the rules of the TM Convention has not been undertaken since it entered into force in 1969. This effort provides an opportunity for such review. It also establishes a mechanism to systematically identify gaps for which amendments of the Convention may be deemed necessary, and evaluate approaches to make associated changes to the Convention.

Priority and target completion date

5 This proposal is in pursuit of "measures aimed at improving the safety and health of ship's crews or personnel" and "measures to correct significant inadequacies identified in existing instruments". The unplanned output should, therefore, be accorded high priority within the terms of paragraph 2.11 of MSC-MEPC.1/Circ.2.

6 To ensure the most timely completion date, this item should be referred to the SLF Sub-Committee at its next session, scheduled for January 2012. Completion will require three sessions, with a target completion year of 2014.

Specific indication of action required

7 The specific actions under this unplanned output are as follows:

- .1 **identify areas for improvement:** Conduct a comprehensive review of the rules and requirements of the TM Convention, associated interpretations of TM.5/Circ.5, and other interpretations or practice. Identify areas where the TM Convention, as interpreted by TM.5/Circ.5, does not ensure uniform application of the tonnage measurement rules and/or unnecessarily affects ship design or safety (including crew accommodation) when alternate approaches under the rules of the TM Convention could yield a better outcome. This includes treatment of semi-open spaces such as those within open-top containerships, and treatment of enclosed spaces that are associated with deck cargo;
- .2 **update and revise interpretations:** Update, expand and strengthen the interpretations of TM.5/Circ.5 to address to the maximum extent possible those concerns identified in subparagraph .1 above. Consider and incorporate as appropriate changes to the TM.5/Circ.5 format and content, with the view toward replacing it with an updated version; and
- .3 **make recommendations on amendments:** Make recommendations, as appropriate, to the MSC on amendments to the TM Convention to ensure the integrity and uniform implementation of the existing measurement system of the Convention, and/or would provide for improved safety or design (including crew accommodation) under this measurement system. Include recommendations on possible approaches to implementing such amendments (e.g., protocol vs. unanimous acceptance).

Remarks on the criteria for general acceptance

8 The subject of the proposal is within the scope of IMO's objectives, and the benefits justify the proposed action. [The proposal is in pursuit of "measures aimed at improving the safety and health of ship's crews or personnel" and "measures to correct significant inadequacies identified in existing instruments" within the terms of paragraph 2.11 of MSC-MEPC.1/Circ.2].

Identification of which subsidiary bodies are essential to complete the work

9 The work should be accomplished by the SLF Sub-Committee [in conjunction with the DE and STW Sub-Committees, as appropriate].

ANNEX 4

ISSUES IDENTIFIED FOR OPTION A

Ensure integrity and uniform implementation of existing gross tonnage (GT) and net tonnage (NT) parameters

Issue 1 – Length definition

There are several areas where neither the TM Convention nor TM.5/Circ.5 provides sufficient information to permit assignment in a consistent manner of the length dimension, which is a determining factor for applicability of the TM Convention, and is widely used for applying design standards and, in some cases, fees. For example, the term "least moulded depth", which is the basis for the length assignment, is undefined, and various interpretations of the term can lead to length dimensions varying on the order of 5% or more. Further, with the increasing use of trainable water-jet propulsion units and similar combination steering/propelling devices, many ships are no longer fitted with rudder stocks, which is a key input in the length determination. Also, length can vary depending on treatment of bulbous bows, raked bows, raked transoms, sloping transoms, etc.

Issue 2 – Novel craft provisions

Regulation 1(3) has been construed as allowing a flag State to calculate gross tonnage based on economic and safety considerations, "exempting" fully enclosed spaces which would otherwise have been included in tonnage. The result is the assignment of gross tonnage not reflective of a ship's "overall size" as defined in Article 2(4). One Contracting Government reported via TM Circular that it was using this approach in the measurement of four ships under its flag. Applying novel craft provisions in this manner can result in assignment of gross/net tonnages that have no relationship to a ship's overall size/useful capacity.

Issue 3 – Tonnage grandfathering

Articles 3(2)(b) and (d) grant grandfathering privileges to certain older ships that have not undergone alterations "deemed by the Administration" to be a "substantial variation in their existing gross tonnage". This provision allows a qualifying ship's owner to use the pre-existing national tonnage (GRT) to apply older breakpoints in international conventions, including SOLAS and MARPOL. As described in document SLF 38/10/1 dated 16 December 1993, there appeared to be broad agreement that "substantial variation" meant a gross tonnage change on the order of 10%, and that a 1% change was effectively within the limit of calculation accuracy. Nonetheless, TM.5/Circ.5 established a 1% change as the breakpoint for loss of grandfathering privileges, creating confusion among ship owners, presenting difficulties in ensuring compliance, and raising the possibility of legal challenge.

Issue 4 – Listing of spaces on the International Tonnage Certificate (ITC)

The reverse side of the ITC form provides for the listing of information on included spaces (both cargo and non-cargo spaces) and excluded spaces. Presumably, this was to permit ready verification that a ship has not undergone changes since the ITC was issued, and that spaces used for carrying cargo and stores had been properly accounted for in tonnage. However, with advances in ship designs and resulting complex hull and superstructure geometries, the practice of listing enclosed spaces by "tiers" is becoming increasingly difficult to maintain and consistently apply. Also, it is unclear whether smaller individual spaces (e.g., masts, deck lockers, settees) should be listed separately on the ITC. Additional guidance on this subject would help ensure consistency among flag States.

Issue 5 – Specifying lengths of spaces on ITC

The reverse side of the ITC form provides for specifying the length of all listed spaces, presumably to assist in verification that a ship has not undergone changes since the tonnages were certified. However, in many cases it is difficult to establish the length of a deckhouse or other above-deck space, as the ends of deck structures are frequently stepped, fitted with deck overhangs, have lockers or seating that is built into or otherwise attached to the structure, etc. This has led to inconsistent application, both within and between flag States.

Issue 6 – Listing excluded spaces on the ITC

The reverse side of the ITC form provides a space for listing excluded spaces, but lacks sufficient room for specifying all excluded spaces on larger ships of complex design (e.g., cruise ships). Nor is it clear that the mere listing of an excluded space provides sufficient information to permit meaningful verification without access to associated tonnage calculations. Finally, space limitations on the form, and confusion regarding the need to even list excluded spaces, has resulted in different approaches among flag States, ranging from the attachment of addenda to the ITC, to omitting reference to the spaces altogether. Consideration should be given to either expanding this information (perhaps through use of a "standardized" addendum), or deleting the requirement altogether.

Issue 7 – Remeasurement following alterations

There are no universally accepted criteria for remeasuring a ship following alterations/modifications. Different administrations apply different criteria: tonnage changes of unity, 1%, 2%, 5% and 10% have all been quoted, which can be problematic when a ship changes flag. Even small changes in assigned gross tonnage can cause ships to exceed critical regulatory breakpoints, affecting the design and operating standards that apply to the ship (e.g., SOLAS, MARPOL, and STCW tonnage-based requirements). Further, it is unclear why a decrease in gross or net tonnage does not necessitate the remeasurement of a ship, if these parameters are to remain reflective of the ship's overall size and useful capacity, respectively.

Issue 8 – Acceptance of interpretations of TM.5/Circ.5

Article 13 precludes the claiming of the privileges of the TM Convention unless the ship holds a "valid" certificate under the Convention; however, the term "valid" is not defined in this context. The circumstances under which a port State could consider an ITC invalid, and therefore detain a ship, are unclear. TM.5/Circ.5 provides related interpretative language referring to Article 10(2), which appears to make the interpretations of TM.5/Circ.5 binding if a ship is undergoing a flag change. Consideration should be given to expanding this provision of TM.5/Circ.5 to include all ships, provided the interpretations are not applied retroactively.

Issue 9 – Requirement for a deck above to bound enclosed space

Regulation 2(4) is unclear as to whether a space not within the ship's hull must be bounded by a deck above, in order for that space to be considered enclosed and therefore included in the total volume of all enclosed spaces (V). The issue was discussed at SLF 30 (SLF 30/WP.4), and a decision made that, in effect, a deck above was required to bound an enclosed space, although there was not universal agreement on this interpretation. In theory, under this interpretation, the space bounded by the high coamings is not enclosed. Subsequently, IMO has issued interpretations that call for inclusion in V of the volumes inside coamings of open-top containerships. IMO has also issued interpretations that address volumes associated with dock wells on dockship, that are subject to interpretation with respect to those spaces bounded by coamings.

Issue 10 – Treatment of temporary deck equipment

Increasingly, ships in certain services are being fitted with temporary/semi-permanent tanks or modular installations such as portable quarters, seismic trailers, and processing facilities, which are sometimes referred to as "temporary deck equipment". Per Regulation 2(4), spaces bounded by portable partitions are included in volume measurement for tonnage calculation, yet TM.5/Circ.5 implies that a tank on the upper deck that is connected to ship systems must be "permanent" in order for it to be included in tonnage. While at least one flag State treats temporary deck equipment in the same manner as any other enclosed structure, it is not clear how other flag States are treating such spaces, nor is it clear how such spaces are to be identified on ITC.

Issue 11 – Treatment of deck cargo bounded by enclosing structure

Neither the TM Convention nor TM.5/Circ.5 specifically addresses treatment of deck cargo. The space associated with deck cargo that is containerized or otherwise bounded by enclosing structure (e.g., portable liquid cargo tanks) appears to meet the definition of "enclosed space" in the sense that the space is bounded by "portable partitions or bulkheads". Therefore, it is unclear under what authority such enclosed deck cargo space may be ignored when calculating tonnage, as is typically the case, or why such spaces are treated differently from portable quarters and other temporary deck equipment spaces.

Issue 12 – Treatment of spaces underneath overhangs

Under the enclosed space definition of regulation 2(4), space bounded by a deck above is considered enclosed space, and can be excluded only if it meets the excluded space requirements of regulation 2(5). It appears that bridge wings and other overhangs do, in fact, bound enclosed space under this definition, even though as a matter of practice, such spaces are generally ignored. Consideration should be given to developing generalized criteria (possibly under novel craft provisions) that could allow spaces with large height to breadth/depth aspect ratios, such as those bounded from above by bridge wings, to be considered as "unenclosed" and ignored from volume calculations.

Issue 13 – Definition of awning

The TM Convention treats spaces bounded by awnings differently than other spaces, but neither the TM Convention nor TM.5/Circ.5 defines what an awning is. For example, is an awning only cloth (e.g., canvas, tarpaulin), or does the term include other flexible solids such as plastic sheeting, or even materials such as Kevlar that have strength properties comparable to steel? Alternatively, should the term "awning" be defined on a functional basis (e.g., as a permanent or movable structure to protect the deck from the sun only)? There have also been differences in interpretations as to whether, by extension, fabric covers and partitions are considered to bound space that would otherwise be enclosed. Depending on how this is interpreted, designers can obtain substantial reductions in tonnage through substitution of materials.

Issue 14 – Treatment of space bounded by awnings

While regulation 2(4) indicates that a "permanent or movable awning" is not considered to bound an enclosed space, TM.5/Circ.5 treats space within the bounds of such awnings as enclosed space, which is excluded from volume calculations only if it meets certain conditions. It is possible that paragraph 4.2 was referring to spaces bounded on the sides by fabric-like material. Either way, it appears that TM.5/Circ.5 requires clarification.

Issue 15 – Shelves or other means for securing cargo or stores in excluded spaces

Under regulation 2(5), certain qualifying spaces may be excluded from tonnage calculations provided they are not "fitted with shelves or other means for securing cargo or stores", regardless of whether or not the spaces are appropriated for the carriage of cargo or stores. Consistent application of this provision has proven problematic, as designers have devised ways to effectively secure cargo without the need for the space to be "fitted" with any means of securing it. In addition, there has been disagreement on what constitutes "stores", as under the equally authentic French version of the TM Convention, the term "provisions" is used. "Provisions" includes food and possibly other items of necessity, but not items such as ropes and lifejackets.

Issue 16 – Impact of end opening obstructions on excluded spaces

While regulation 2(5)(a) addresses obstructions to end openings within a deck structure, neither this regulation nor TM.5/Circ.5 addresses the situation where there is an obstruction external to the opening. For example, gantry structures on fishing trawlers, large cable reels on certain towing and industrial vessels, and excessively high bulwarks extending on either side of the openings may serve to "protect" the openings, and are taken into consideration by some flag States. Guidance on how to address such situations would be helpful to ensure consistent treatment, and prevent exclusion of spaces that are effectively protected from the sea and weather.

Issue 17 – Excluding space opposite an end opening as a recess

If an opening in the end of a structure is treated as a "recess" under regulation 2(5)(e) instead of a "space opposite an end opening" under regulation 2(5)(a), up to twice the amount of space may be excluded. Various approaches have been used to address this issue, including the establishment of definitions for the term "boundary bulkhead" that would preclude treatment of a "typical" end opening as a recess. Clarification would be helpful to ensure consistency and avoid misuse.

Issue 18 – Characteristics of end and side openings for excluded spaces

Under regulation 2(5), the criteria for excluding space opposite end and side openings are largely prescriptive in nature, and can result in substantively different tonnage assignment on ships for which the physical arrangement varies only on the order of centimetres. Examples include: 1) criteria based on deck beam size under regulation 2(5)(a); 2) requirements for a structure to be "side-to-side" under regulation 2(5)(c); 3) impact of fitting of rails (allowed under regulation 2(5)(b) but not under regulation 2(5)(c)); and 4) prohibition against fitting of fashion plating to stanchions under regulation 2(5)(b). Consideration should be given to development of functional requirements (possible under novel craft provisions). This would provide a more accurate indication of spaces that are sufficiently open to qualify for exclusion from tonnage where prescriptive requirements are inadequate and could adversely affect ship design.

Issue 19 – Deck structure height requirements for excluded space side openings

Increasingly, ships of certain types (e.g., cruise ships, car carriers) have spaces opposite large side openings that may not qualify for exclusion as recesses under regulation 2(5)(e), but could possibly be considered for exclusion under regulation 2(5)(c). However, regulation 2(5)(c) requires side openings to be at least "one third of the height" of the associated deck structure (erection) in order to allow a qualifying space to be excluded from volume calculations. It is unclear whether this height is taken to the top of the entire structure (the most "conservative" approach), or to an internal deck within the structure (an approach which could lead to fitting of "false" decks within the ship to allow smaller openings).

Issue 20 – Restrictions on excluding space below uncovered openings

The text of regulation 2(5)(d) and the accompanying figure leave it unclear as to the extent to which a space "immediately below" a deck opening may be excluded. A question along these lines was raised by a flag State in document SLF 29/10, but was not resolved. Clarification would be helpful to ensure consistency and avoid misuse.

Issue 21 – Remeasurement following net tonnage change

It is unclear how the regulation 5 language relates to the language in article 10 of the Convention, which also addresses remeasurement. For example, if a change in the characteristics cited in regulation 5 causes net tonnage to change by an amount of unity (one unit of net tonnage), does the regulation 5 language require both gross and net tonnage to be recalculated and recertified, even if the gross tonnage change is not of sufficient magnitude to cause remeasurement?

Issue 22 – Treatment of topside spaces of complex shape

Accounting for the volume measurement of miscellaneous topside spaces having complex shape can be problematic in terms of evaluating whether the space may be ignored under TM.5/Circ.5 guidance as "not exceeding 1 m³", and/or in the excessive amount of time involved in calculating the "enclosed volume". Examples include shore gangway storage, double skin bulwarks, outside moulded seating (which may or may not be part of a bulwark), Jacuzzis and sun lounges, recessed swimming pools and spaces bounded from above by complex roof designs. These features are typically seen on yachts of modern construction, but may also be encountered in other ship types, including passenger ships.

Issue 23 – Treatment of hull spaces of complex shape

Column-stabilized units, such as semi-submersible drilling units, and ships of similar design are often fitted with cross-bracing, for which volumes can be extremely difficult to calculate. Consideration should be given to developing guidance on how to treat such volumes in an efficient and consistent manner.

Issue 24 – Evaluating accessibility of mast, kingposts and support structures

TM.5/Circ.5 allows masts, kingposts, cranes, crane and container support structures that are greater than 1 m³ in volume to be ignored when calculating volume, if they are "completely inaccessible". In practice, however, the majority of such spaces are accessible in some fashion for survey and maintenance, which brings the "accessibility" constraint into question. This matter should be reviewed in the interest of ensuring consistent measurement treatment of such spaces.

Issue 25 – Treatment of spaces inside the hull as open to the sea

Regulation 6(3) allows volumes of spaces open to the sea to be excluded from tonnage. The degree to which a normally flooded or free-flooding space inside the hull is considered "open" has required interpretation, in view of the criteria of regulation 2(5) that requires spaces above the upper deck to be reasonably "open" before they may be excluded. Further, designers have sought to reduce tonnage or principal dimensions through contrivances to treat otherwise enclosed spaces as spaces that are "open spaces to the sea". Examples include: 1) standpipes in underdeck voids and ballast spaces; 2) holes in bows and sterns of ships of all types; and 3) holes in cross-deck structures on multi-hull ships. Consideration should be given to developing guidance on how to treat such volumes in a consistent manner.

Issue 26 – Treatment of spaces outside the hull as open to the sea

Regulation 6(3) allows volumes of spaces open to the sea to be excluded from tonnage. The degree to which a space outside the hull is considered open to the sea has required interpretation in cases where free communication between the space and the sea is in some way restricted. Examples include: 1) "wells" or "pockets" for retractable keels and stabilizers with fairing plates; 2) semi-weatherproof storage spaces in the stern step areas of yachts that are protected from the sea by non-watertight closures; 3) bow thrusters tunnels fitted with doors to reduce underwater resistance; and 4) sea valve recesses ("sea chests") fitted with fine mesh strainers.

Issue 27 – Treatment of moon pools

Moon pools and similar large "through-hull" openings that are sometimes fitted with covers or are otherwise covered from above by enclosing structure within the ship's hull or above the upper deck. In addition, some moon pool wells are fitted with retractable doors at their lower extremities, or at some distance from the keel, which in some cases serve as non-watertight fairings and in other cases as watertight closures. It is unclear as to whether spaces fitted with such covers or doors may be excluded as open to the sea under regulation 6(3), and if so, to the extent the space above the doors may be treated as excluded.

Issue 28 – TM.5/Circ.5 format and content

The consolidated interpretations of the annex to TM.5/Circ.5, which is 11 pages long, have grown considerably since such interpretations were initially issued in 1979 as a three-page document. Further, interpretations established over the years were often developed to address specific situations, rather than providing broader guidance applicable to more general situations. In addition, updating of the Interpretations is necessary to reflect the action of the Recommendations concerning tonnage measurement of open-top containerships (resolution MSC.234(82)). Consideration should be given to comprehensive review of the TM Circular, with the view toward replacing it with an updated version that is easier to use. This updated version could consolidate interpretations where appropriate, and express them in a more general way.

Issue 29 – Single Voyage For Vessel Delivery

Under articles 2(3), 3(1), 7(1) and 12(1)(a), a ship flying the flag of a country that is party to the TM Convention is subject to the Convention and must have an ITC on board the ship when engaged on an international voyage. Consideration should be given to exempting ships from these requirements when engaged on a single international voyage between the originating country and the ship's flag State for purposes of ship delivery (e.g., after the ship is initially constructed or otherwise obtained).