

SUB-COMMITTEE ON BULK LIQUIDS AND
GASES
16th session
Agenda item 11

BLG 16/11/2
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CONSIDERATION OF IACS UNIFIED INTERPRETATIONS

Secondary means of venting cargo tanks

Submitted by IACS, OCIMF, IPTA and INTERTANKO

SUMMARY

Executive summary: This document further discusses the issue of the secondary means of venting cargo tanks and offers a way forward on the issue if BLG 16 has similar comments as FP 55 had on IACS UI SC 140 revision 3

Strategic direction: 1.1

High-level action: 1.1.2

Planned output: 1.1.2.2

Action to be taken: Paragraph 6

Related documents: MSC 70/INF.23; MSC 71/23 (paragraph 22.13); FP 55/8/9, FP 55/8/11, FP 55/23 (paragraphs 8.20 and 8.21) and BLG 16/11/1

Introduction

1 IACS has submitted the latest version of its UI SC 140 (revision 3) relating to the secondary means of venting cargo tanks to this session of the Sub-Committee as BLG 16/11/1. This version of UI SC 140 was also submitted to the last session of the FP Sub-Committee at annex to FP 55/8/9. OCIMF submitted its comments on FP 55/8/9 in FP 55/8/11.

2 The outcome of the FP Sub-Committee's consideration of this latest version of UI SC 140 is reported in paragraphs 8.20 and 8.21 of FP 55/23, i.e. having considered FP 55/8/9 and FP 55/8/11, the Sub-Committee:

"... endorsed the arguments put forward by OCIMF, which were supported by many delegations, and invited IACS, in consultation with OCIMF and other interested delegations, to review the interpretation, taking into account the comments contained in document FP 55/8/11, with a view to providing BLG 16 with the outcome of such deliberations (FP 55/23, paragraph 8.21)."

Discussion

3 IACS and OCIMF have further discussed the IACS UI and come to the conclusion that a way forward, if the BLG Sub-Committee shares the sentiments of FP 55 on this matter, would be to initiate a process to develop appropriate amendments to the provisions of SOLAS chapter II-2 relating to the secondary means of venting cargo tanks, so as to remove the necessity for any unified interpretations on the matter.

4 If the Sub-Committee agrees that this is an effective and efficient means of making progress on this important safety issue, the co-sponsors believe the Sub-Committee may wish to avail itself of the provisions of paragraph 5.9 of the Guidelines on the organization and method of work of the Committees and their subsidiary bodies (MSC-MEPC.1/Circ.4), i.e.:

"However, in compliance with paragraph 4.9, when seeking the Committee's authorization to act as provided in the previous two sentences (or when spontaneously proposing an unplanned output for the current biennium or a new output to be accepted for inclusion in a Committee's post-biennial agenda), subsidiary bodies should ensure that their request complies with the provisions of paragraphs 4.6, 4.7 and 4.14, as appropriate."

5 It is also noted how paragraph 5.9 of MSC-MEPC.1/Circ.4 goes on, i.e.:

"As subsidiary bodies may not have sufficient time to develop the required information, given that usually their biennial agendas are only discussed at the end of their sessions, interested delegations should, in consultation with the subsidiary body Chairman and the Secretariat, prepare the information which should accompany the proposal necessary for the Committee(s) to decide whether an unplanned output should be included in the subsidiary body's biennial agenda or in a Committee's post-biennial agenda."

In this regard, the co-sponsors have developed the information provided at the annex to this document for further consideration of the Sub-Committee, with a view to it, or any improved version, being forwarded to MSC 90.

Action requested of the Sub-Committee

6 The Sub-Committee is invited to consider the above discussion and decide as appropriate.

ANNEX

DRAFT PROPOSAL FOR A NEW UNPLANNED OUTPUT IN THE BIENNIAL AGENDAS OF THE BLG AND FP SUB-COMMITTEES TO AMEND THE PROVISIONS IN SOLAS CHAPTER II-2 RELATING TO THE SECONDARY MEANS OF VENTING CARGO TANKS

1 This proposal for inclusion of an unplanned output is submitted in accordance with paragraphs 4.7, 5.9 and annex 1 of the Guidelines on the organization and method of work of the Committees and their subsidiary bodies (MSC-MEPC.1/Circ.4), taking into account the Organization's objectives (resolutions A.900(21) and A.909(22)) and the High-level Action Plan for the Organization and priorities for the 2010-2011 biennium (resolution A.1012(26)).

IMO's objectives

2 This proposal is considered entirely consistent with, and supporting of, the objectives of the Organization, as provided in resolutions A.900(21) and A.909(22), in particular "*ensuring the effective uniform implementation of existing IMO standards and regulations relating to maritime safety and environmental protection*" and "*the needs of the shipping industry should be duly taken into account*".

3 Noting the protracted efforts there have been for a number of years to understand the intent and rationale, and implement in a global and consistent manner, the SOLAS provisions relating to secondary means of venting cargo tanks; it is considered that this proposal is entirely consistent with Strategic Directions 2 and 5.2, i.e. "*IMO will foster global compliance with its instruments governing international shipping and will promote their uniform implementation by Member States*" and "*Enhancing technical, operational and safety management standards*" respectively. In particular, this proposal is considered consistent with, and supporting of, High-level Actions 2.0.1 and 5.2.1, i.e. "*Monitor and improve conventions, etc., and provide interpretations thereof if requested by Member States*" and "*Keep under review the technical and operational safety aspects of all types of ships, including fishing vessels*" respectively.

4 For the ship types under consideration (tankers), the proper and effective design, installation and operation of a secondary means of venting cargo tanks is critical to the safety of the vessel and those on board.

Compelling need

5 Noting that this proposal is for the Organization to embark upon a process to develop appropriate amendments to an existing convention (SOLAS), it is considered that there is a "compelling" need to undertake this work based on the following reasoning. This issue is directly related to the safety of ships, and more importantly the crews that serve on them. It is further noted that problems and shortcomings have been identified in the existing regulatory framework. This is demonstrated by the fact that an IACS UI has been found to be necessary to provide a common understanding of the intent of the regulation, which the FP Sub-Committee, at least, has now agreed should be further reviewed in light of the comments provided by OCIMF in FP 55/8/11. The current uncertainty in the correct implementation of the intent of the regulations needs to be addressed as a matter of priority.

6 The 1996 amendments to SOLAS chapter II-2 introduced requirements relating to the secondary means of venting for tankers. These amendments were developed as result of the Organization being aware of a number of major over pressurization incidents (such as Mobil Petrel, British Argosy and Credo) that have resulted in major structural failure on board

the vessel, substantial plant damage and only by good luck, no loss of life. In some cases it has been necessary to activate national major incident plans.

Analysis of the issue

7 The 1996 amendments to SOLAS chapter II-2 relating to the secondary means of venting cargo tanks became effective for new tankers constructed after 1 July 1998 and for existing tankers, at the first scheduled dry-docking after 1 July 1998. IACS submitted its Unified Interpretation UI SC 140 to the Organization in document MSC 70/INF.23. This UI accepted the P/V-breaker as the secondary means of venting for tankers where cargo tanks would not be isolated from the cargo tank venting/inert gas main during loading, ballasting or discharging operations. This IACS unified interpretation was based on SOLAS regulations II-2/4.5.3.2.2 and II-2/11.6.1.1, which indicate that isolation of a cargo tank is acceptable provided P/V-valves with capacity for flow of small volumes for thermal breathing were provided, as well as the requirement for isolation valves to be provided with locking arrangements under the control of the responsible ship's officer. The Committee noted with interest the information provided by IACS in document MSC 70/INF.23 (paragraph 22.13 of MSC 71/23).

8 In response to the submission of the latest version of UI SC 140 to FP 55 (FP 55/8/9), OCIMF (in FP 55/8/11) has raised concern that damage to, or inadvertent closing of, a cargo tank isolation valve required by SOLAS regulation II-2/4.5.3.2.2 will render the P/V-breaker ineffective and can therefore lead to tank rupture during loading/unloading. It is acknowledged that SOLAS regulation II-2/4.5.3.2.2 requires such isolation valves to be provided with locking arrangements under the control of the responsible ship's officer, but examples of such inadvertent closing of valves resulting in incidents, indicate that such locking arrangements do not provide an acceptable level of safety. Accordingly, it is considered that as long as such isolating valves are provided, the P/V-breaker is not acceptable as a secondary mean of venting and acceptable alternative means of secondary venting must be provided for each cargo and slop tank. Acceptable alternative means are either individual P/V-valves serving each cargo tank with capacity to permit the passage of large volumes of vapour during loading, ballasting and unloading of a cargo or slop tank (often referred to as full flow P/V-valves), or individual P/V-sensors with alarms for each cargo and slop tank.

9 Based on this concern, several oil majors have required tankers to install full flow P/V-valves on each cargo tank in order to ensure adequate safety against over- and under-pressure in the event a cargo tank isolation valve is damaged or inadvertently closed. This has therefore become a form of "industry standard" on new crude oil tankers for the past 10 years. It should also be noted that USCG requirements related to vapour emission control systems may result in increased capacity of such P/V-valves. Accordingly, the consequences of requiring P/V-valves to have increased capacity are negligible.

10 Having considered FP 55/8/9 and FP 55/8/11, FP 55 *"endorsed the arguments put forward by OCIMF [paragraph 8.20 of FP 55/23], which were supported by many delegations, and invited IACS, in consultation with OCIMF and other interested delegations, to review the interpretation, taking into account the comments contained in document FP 55/8/11, with a view to providing BLG 16 with the outcome of such deliberations"* (FP 55/23, paragraph 8.21).

11 Having further reviewed the issue, it is proposed that SOLAS chapter II-2 is amended to reflect the above industry practice. Noting paragraph 4.25 of MSC-MEPC.1/Circ.4 and the principle therein that "if a problem is raised, then an appropriate solution thereto should also be suggested", a first draft of the proposed amendments is

provided in appendix 1. The proposal implies that the capacity of P/V-valves required in the event of failure or inadvertent closing of an isolation valve has a capacity to permit the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging. Needless to say, such P/V-valves will also allow for thermal breathing of small volumes of air, vapour or inert gas of same tanks during, e.g. laden voyage.

12 It is noted that on chemical tankers each cargo tank is already required to be provided with a P/V-valve with capacity to permit the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging as their primary mean of venting, because they are arranged for isolating cargo tanks from the inert gas main. Hence, the amendment would not affect chemical tankers and therefore an amendment of section 8.3.3 of the IBC Code is not considered necessary.

13 Noting annex 1 to the annex to MSC-MEPC.1/Circ.4, the practicability and feasibility of the proposal have therefore been addressed in paragraphs 9 and 11 above; while the proportionality of the proposal has been discussed in paragraph 12.

Analysis of implications

14 It is recognized that amendments to an IMO convention, in this case SOLAS, will have to be transferred into the national legislation of Member States in order to take legal effect on ships that fly the flag of that State. In this respect the anticipated outcome of this proposal will represent an administrative burden for Governments. However, for those Governments who regulate their ships by a system of primary and secondary legislation, it is hoped that the associated legislative burden will not be excessive, as these amendments only clarify an existing requirement to provide a secondary means of venting cargo tanks, i.e. it is hoped these amendments will not require the time of national parliaments to address.

15 For shipyards and shipowners it is anticipated that these amendments, which will only be applicable to "new ships", will not represent an increase in costs to industry (see paragraph 9 above, which notes the existing industry practice to install full flow P/V-valves on each cargo tank). Indeed, it is considered that the proposal will simplify and harmonize the current industry practice with the international regulatory framework, with benefits to all stakeholders – in particular shipyards and shipowners. There will be an increase in the maintenance, inspection and survey burden if such valves are fitted on all cargo tanks, but there are no foreseen changes to the statutory certification for tankers.

Benefits

16 The proposal will facilitate the global and consistent implementation of the provisions relating to the secondary means of venting cargo tanks, confirm the intent of these vital safety-related requirements and clarify how compliance with the regulatory requirements is to be achieved, which will directly benefit and improve the safety of those working on board tankers.

Industry standards

17 It could be considered that the existing IACS Unified Interpretation SC 140 represents an "industry standard", in that since 1998 it has been used by all IACS Members on newbuildings. However, as recorded in paragraphs 8.20 and 8.21 of FP 55/23, and in light of the new evidence that has been brought to the attention of the organization by OCIMF in FP 55/8/11, an opinion has now been expressed that this Unified Interpretation should, at least, be reviewed.

18 It is also noted that a form of "industry standard" exists, as reported in paragraph 9 above, in that several oil majors have required the installation of full flow P/V-valves on each cargo tank on new crude oil tankers for the past 10 years. Indeed, the OCIMF tanker ship inspection process "SIRE", which has been in place for over 20 years, has a question set, called VIQ (a guide to the inspection of the vessel through a standard question set). Under section 8 (Cargo) of the VIQ, question 8.39 addresses the fitting of secondary ventilation systems to all cargo tanks. The VIQ is a primary guidance tool, next to international regulations and classification rule sets, used in the construction of tanker vessels, and is considered to represent "best industry practice".

Output

19 IN SMART terms (specific, measureable, achievable, realistic and time-bound), the output from this proposal will be amendments to the relevant SOLAS requirements (see appendix 1) that will apply to "new" ships, i.e. contracted for construction on or after the entry into force of the amendments. The draft texts provided in the appendix 1 have been developed by experts from classification societies/Recognized Organizations and ship operators and therefore considered achievable and realistic. The fact that the proposal does not rely on any new or innovative technology or equipment is considered relevant in terms of considering the time-bound element of the output, i.e. the effective implementation of the proposals will not need to wait for new technology to come to the market. Also, in terms of finalizing the Organization's consideration of the issue, reference is made to the section below entitled "Priority/urgency".

Human element

20 The completed checklist as per MSC-MEPC.7/Circ.1 is attached at appendix 2. In particular, it is noted that, as discussed in paragraph 8 above, this "hardware-based" solution is being proposed as a result of concerns that have been raised regarding the fallibility of "human performance". Also, these systems are already fitted on board ships and consequently their operation, maintenance, inspection, testing is already familiar to crews on tankers and no additional training for crews or other stakeholders is anticipated as a consequence of the adoption of the proposed amendments to SOLAS chapter II-2. In particular, "*human element guidance on the application and/or implementation of the proposed solution*" (section 5 of the checklist) already exists for all the listed stakeholders.

Priority/urgency

21 It is considered that this issue should be addressed as a matter of priority and as soon as practicable within the working arrangements of the Organization. This issue is directly related to the safety of ships, and more importantly the crews that serve on them. It is further noted that problems and shortcomings have been identified in the existing regulatory framework.

22 Taking account that a draft text of the amendments is provided in appendix 1, which it is believed will serve as a base text for further improvement, it is proposed that consideration of the issue at one session each of the FP and BLG Sub-Committees will be sufficient to complete the technical analysis, before the draft amendments are forwarded to the Maritime Safety Committee for approval and subsequent adoption.

Action required

23 The Maritime Safety Committee is requested to add a new unplanned output to the biennial agendas for 2012-2013 of the FP and BLG Sub-Committees, with a view to having this work completed as soon as practicable.

* * *

Appendix 1

PROPOSED AMENDMENTS TO SOLAS REGULATION II-2/4.5.3.2.2

1 The text of SOLAS regulation II-2/4.5.3.2.2 is proposed to be amended as follows (additions):

5.3.2.2 Where the arrangements are combined with other cargo tanks, either stop valves or other acceptable means shall be provided to isolate each cargo tank. Where stop valves are fitted, they shall be provided with locking arrangements which shall be under the control of the responsible ship's officer. There shall be a clear visual indication of the operational status of the valves or other acceptable means. Where tanks have been isolated, it shall be ensured that relevant isolating valves are opened before cargo loading or ballasting or discharging of those tanks is commenced. Any isolation must continue to permit the flow caused by thermal variations in a cargo tank in accordance with regulation 11.6.1.1.

For tankers constructed on or after [...], any isolation must also continue to permit the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging in accordance with regulation 11.6.1.2.

Proposed amendments to SOLAS regulation II-2/11.6

2 The text of SOLAS regulation II-2/11.6.1 is proposed to be amended as follows (additions):

6.1 General

The venting arrangements shall be so designed and operated as to ensure that neither pressure nor vacuum in cargo tanks shall exceed design parameters and be such as to provide for:

- .1 the flow of the small volumes of vapour, air or inert gas mixtures caused by thermal variations in a cargo tank in all cases through pressure/vacuum valves; and
- .2 the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging.

In accordance with regulations 4.5.3.2.2 and 11.6.3.2, for tankers constructed on or after [...], any isolation of a cargo tank must also continue to permit the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging.

3 The text of SOLAS regulation II-2/11.6.2 is proposed to be amended as follows (additions):

6.2 Openings for small flow by thermal variations

Openings for pressure release required by paragraph 6.1.1 shall:

- .1 have as great a height as is practicable above the cargo tank deck to obtain maximum dispersal of flammable vapours, but in no case less than 2 m above the cargo tank deck; and
- .2 be arranged at the furthest distance practicable but not less than 5 m from the nearest air intakes and openings to enclosed spaces containing a source of ignition and from deck machinery and equipment which may constitute an ignition hazard. Anchor windlass and chain locker openings constitute an ignition hazard.

In accordance with regulations 4.5.3.2.2 and 11.6.3.2, for tankers constructed on or after [...], the openings must also allow for the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging and must therefore be arranged in accordance with regulation 4.5.3.4.1.

4 The text of SOLAS regulation II-2/11.6.3.2 is proposed to be amended as follows (additions):

6.3.2 Secondary means for pressure/vacuum relief

A secondary means of allowing full flow relief of vapour, air or inert gas mixtures to prevent over-pressure or under-pressure in the event of failure of the arrangements in paragraph 6.1.2, including damage to, or inadvertent closing of, the means of isolation required in regulation 4.5.3.2.2. Alternatively, pressure sensors may be fitted in each tank protected by the arrangement required in paragraph 6.1.2, with a monitoring system in the ship's cargo control room or the position from which cargo operations are normally carried out. Such monitoring equipment shall also provide an alarm facility which is activated by detection of over-pressure or under-pressure conditions within a tank.

* * *

Appendix 2

CHECKLIST FOR CONSIDERING HUMAN ELEMENT ISSUES BY IMO BODIES

<p>Instructions: If the answer to any of the questions below is:</p> <p style="margin-left: 40px;">(A) YES, the preparing body should provide supporting details and/or recommendation for further work. (B) NO, the preparing body should make proper justification as to why human element issues were not considered. (C) NA (Not Applicable) if the preparing body should make proper justification as to why human element issues were not considered applicable.</p>	
<p>Subject Being Assessed: (e.g. Resolution, Instrument, Circular being considered)</p> <p style="margin-left: 20px;">Provisions in SOLAS chapter II-2 relating to secondary means of venting cargo tanks</p>	
<p>Responsible Body: (e.g. Committee, Sub-Committee, Working Group, Correspondence Group, Member State)</p> <p style="margin-left: 20px;">Maritime Safety Committee/FP and BLG Sub-Committees</p>	
1. Was the human element considered during development or amendment process related to this subject?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
2. Has input from seafarers or their proxies been solicited?	<input type="checkbox"/> Yes ✓No <input type="checkbox"/> NA
3. Are the solutions proposed for the subject in agreement with existing instruments? (Identify instruments considered in comments section)	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
4. Have human element solutions been made as an alternative and/or in conjunction with technical solutions?	<input type="checkbox"/> Yes ✓No <input type="checkbox"/> NA
5. Has human element guidance on the application and/or implementation of the proposed solution been provided for the following:	
• Administrations?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
• Shipowners/managers?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
• Seafarers?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
• Surveyors?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
6. At some point, before final adoption, has the solution been reviewed or considered by a relevant IMO body with relevant human element expertise?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
7. Does the solution address safeguards to avoid single person errors?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
8. Does the solution address safeguards to avoid organizational errors?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
9. If the proposal is to be directed at seafarers, is the information in a form that can be presented to and is easily understood by the seafarer?	<input type="checkbox"/> Yes <input type="checkbox"/> No✓NA
10. Have human element experts been consulted in development of the solution?	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
11. HUMAN ELEMENT: Has the proposal been assessed against each of the factors below?	
<input type="checkbox"/> CREWING. The number of qualified personnel required and available to safely operate, maintain, support, and provide training for system.	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> PERSONNEL. The necessary knowledge, skills, abilities, and experience levels that are needed to properly perform job tasks.	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> TRAINING. The process and tools by which personnel acquire or improve the necessary knowledge, skills, and abilities to achieve desired job/task performance.	✓Yes <input type="checkbox"/> No <input type="checkbox"/> NA

<input type="checkbox"/> OCCUPATIONAL HEALTH AND SAFETY. The management systems, programmes, procedures, policies, training, documentation, equipment, etc. to properly manage risks.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> WORKING ENVIRONMENT. Conditions that are necessary to sustain the safety, health, and comfort of those on working on board, such as noise, vibration, lighting, climate, and other factors that affect crew endurance, fatigue, alertness and morale.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> HUMAN SURVIVABILITY. System features that reduce the risk of illness, injury, or death in a catastrophic event such as fire, explosion, spill, collision, flooding, or intentional attack. The assessment should consider desired human performance in emergency situations for detection, response, evacuation, survival and rescue and the interface with emergency procedures, systems, facilities and equipment.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<input type="checkbox"/> HUMAN FACTORS ENGINEERING. Human-system interface to be consistent with the physical, cognitive, and sensory abilities of the user population.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
<p>Comments: (1) Justification if answers are NO or Not Applicable. (2) Recommendations for additional human element assessment needed. (3) Key risk management strategies employed. (4) Other comments. (5) Supporting documentation.</p>	