

SUB-COMMITTEE ON SHIP SYSTEMS AND
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REPORT TO THE MARITIME SAFETY COMMITTEE

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1 GENERAL

1.1 The Sub-Committee on Ship Systems and Equipment (SSE), held its fifth session from 12 to 16 March 2018, chaired by Dr. S. Ota (Japan). The Vice-Chair, Mr. U. Senturk (Turkey), was also present.

1.2 The session was attended by delegations from Member States, an Associate Member of IMO, and observers from intergovernmental organizations and non-governmental organizations in consultative status, as listed in document SSE 5/INF.1.

Opening address

1.3 The Secretary-General welcomed participants and, having expressed condolences for those who lost their lives or were missing in the casualty of the **Maersk Honam**, delivered the opening address, the full text of which can be downloaded from the IMO website at: <http://www.imo.org/en/MediaCentre/SecretaryGeneral/Secretary-GeneralsSpeechesToMeetings>

1.4 In this regard, the delegations of the Philippines and Singapore made statements on the aforementioned casualty aboard the **Maersk Honam**. The full text of these statements is reproduced in annex 8.

Chair's remarks

1.5 In responding, the Chair extended the condolences of the Sub-Committee to all of those affected by the above reported incident; thanked the Secretary-General for his words of guidance and encouragement; and assured him that his advice and requests would be given every consideration in the deliberations of the Sub-Committee.

Adoption of the agenda and related matters

1.6 The Sub-Committee adopted the agenda (SSE 5/1) and agreed to be guided in its work, in general, by the annotations contained in document SSE 5/1/1 (Secretariat) and the arrangements set out in document SSE 5/1/2 (Secretariat).

2 DECISIONS OF OTHER IMO BODIES

General

2.1 The Sub-Committee noted the decisions and comments pertaining to its work made by MSC 98, III 4, A 30 and SDC 5, as reported in documents SSE 5/2 and SSE 5/2/1 (Secretariat), and took them into account in its deliberations when dealing with the relevant agenda items.

Outcome of MSC 98

2.2 The Sub-Committee also noted that MSC 98 had taken the following decisions:

- .1 with regard to the practical application of the *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments* (MSC.1/Circ.1500), agreed that:
 - .1 sub-committees should ensure completion of check/monitoring sheets for draft amendments having a long history of development and refinement;

- .2 for the draft amendments to be considered and finalized by sub-committees in plenary within one session, the Secretariat may be instructed, when necessary, to complete part III of the check/monitoring sheet and the records for regulatory development after the session, instead of establishing a specific working/drafting group;
 - .3 "minor corrections" (referred to in paragraph 3.2(vi) of document C/ES.27/D) could be excluded from application of the provisions for completion of the check/monitoring sheet and the records for regulatory development; and
 - .4 the application of the Guidance should be expanded to all safety-related IMO conventions and mandatory instruments under those conventions; and
- .2 adopted revised *Rules of Procedure of the Maritime Safety Committee* to harmonize the committees' rules of procedure, in particular rules 3 (extraordinary session) and 34.1 (quorum).

Outcome of A 30

2.3 It was further noted by the Sub-Committee that A 30, following the recommendations made by MSC 98, had adopted the *Escape route signs and equipment location markings* (resolution A.1116(30)), which will take effect on ships constructed on or after 1 January 2019 or which undergo repairs, alterations, modifications and outfitting within the scope of SOLAS chapters II-2 and/or III, as applicable, on or after 1 January 2019.

3 SAFETY OBJECTIVES AND FUNCTIONAL REQUIREMENTS OF THE GUIDELINES ON ALTERNATIVE DESIGN AND ARRANGEMENTS FOR SOLAS CHAPTERS II-1 AND III

General

3.1 The Sub-Committee recalled that MSC 95 had agreed, as part of a work plan on the development of functional requirements for SOLAS chapter III, that SSE 4 would finalize the functional requirements for SOLAS chapter III for submission to MSC 98 for approval (MSC 95/22, paragraph 12.7.3).

3.2 The Sub-Committee also recalled that MSC 98, having considered the experience gained with the application of the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1) in the context of the development of the draft functional requirements and the expected performance for SOLAS chapter III, had instructed the Sub-Committee to revise the Generic guidelines at a future session, taking into account document MSC 98/12/3 (China), and to include guidance on how to develop the functional requirements of SOLAS chapter III once the Committee had approved their quantified expected performance.

Draft functional requirements for SOLAS chapter III

3.3 With regard to the draft functional requirements for SOLAS chapter III, the Sub-Committee also recalled that MSC 98 had instructed it to consider the following principles when describing the necessary function of the draft functional requirements (expected performance) in quantitative terms:

- .1 functional requirements should be formulated in a clear, unambiguous and objective manner;
- .2 the expected performance should be expressed as precisely as possible, preferably in quantitative terms; and
- .3 the approach proposed in document MSC 98/12/6 (Germany) and the information contained in annex 4 to document SSE 4/3 (Sweden) should be used by the Sub-Committee to take the initial steps in attempting to describe functional requirements in quantitative terms,

and had invited Member States and international organizations to submit relevant information and data to the Sub-Committee for consideration and action, as appropriate (MSC 98/23, paragraphs 12.13 and 12.14).

Safety objectives and functional requirements for life-saving appliances and arrangements

3.4 The Sub-Committee had for its consideration the following documents related to the development of, and approach for addressing, functional requirements for life-saving appliances and arrangements:

- .1 SSE 5/3 (Germany), providing a methodology with a focus on SOLAS chapter III for the further development of quantitative expected performance as the necessary element to provide criteria for both: verifying compliance of the prescriptive regulations with the goals and for the evaluation of alternative design and arrangements, as well as an example of how quantitative expected performances can be used to specify safety thresholds for prescriptive regulations;
- .2 SSE 5/3/1 (United States), proposing, based on the inherent link between novel life-saving appliances and arrangements and alternative design and arrangements, that the goals, functional requirements and expected performance criteria for SOLAS chapter III should first be utilized to ensure the consistent application of SOLAS regulations III/4.3 (novel life-saving appliances or arrangements) and III/38 (Alternative design and arrangements) and the *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212) before the Organization undertakes a comprehensive revision of SOLAS chapter III or the LSA Code. Furthermore, proposing that the goals, functional requirements and expected performance criteria should be included as a new appendix to the Guidelines;
- .3 SSE 5/3/2 (Germany), providing comments on document SSE 5/3, taking into account the principles established at MSC 98 that "the expected performance should be expressed as precisely as possible and, preferably, in quantitative terms" (MSC 98/23, paragraph 12.13.2), and proposing to adjust some of the expected performances included in annex 1 to document SSE 5/3 in order to quantify the expected performance; and
- .4 SSE 5/INF.7 (United States), providing the results of their efforts to advance the development of goals, functional requirements and expected performance criteria for life-saving appliances in support of the approval of alternative designs and arrangements according to SOLAS regulation III/38.

3.5 In considering whether the focus of the work should be SOLAS chapter III, as proposed in document SSE 5/3, or the consistent application of SOLAS regulations III/4.3 and III/38 and the *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212) before the Organization undertakes a comprehensive revision of SOLAS chapter III or the LSA Code, as proposed in document SSE 5/3/1, the Sub-Committee noted the following views, inter alia:

- .1 the goal of this work should be to develop methodologies for SOLAS regulation III/38 to be universally and consistently applied; therefore, the Sub-Committee should not stray from that goal, while also taking into account the capabilities of end users;
- .2 taking into account the progress made so far with regard to the formulation of functional requirements and expected performance for SOLAS chapter III, the direction set by MSC 95 should be followed;
- .3 the work done on the development of functional requirements and expected performance should also be useful if the focus of the work moved to the consistent application of regulations III/4.3 and III/38 and the Guidelines;
- .4 the proposal in document SSE 5/3/1 would avoid the necessity for a comprehensive review of SOLAS chapter III and the LSA Code;
- .5 the process of extraction of goals, functional requirements and expected performance from the prescriptive regulations of SOLAS chapter III has introduced the notion that said chapter needed to be restructured to align it with a goal-based approach;
- .6 any gaps within SOLAS chapter III and the LSA Code should not be addressed under this output; and
- .7 the reverse engineering approach (SSE 5/INF.7, paragraph 6) proposed to address the consistent application of SOLAS regulations III/4.3 and III/38 and the Guidelines may not be in line with the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1).

3.6 In light of the foregoing and having noted that the main intent of the reverse engineering process was to ascertain underlying fundamentals of prescriptions, in line with the Formal Safety Assessment (FSA) methodology, the Sub-Committee agreed that:

- .1 the goals, functional requirements and expected performance criteria for SOLAS chapter III cannot be separated from those for life-saving appliances covered by the LSA Code;
- .2 the primary focus of this output is the development of goals, functional requirements and expected performance criteria for the evaluation of alternative design and arrangements according to SOLAS regulation III/38 and the *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212); and
- .3 once the Guidelines have been amended, to include the goals, functional requirements and expected performance criteria for life-saving appliances so they could be referenced in SOLAS regulation III/4.3.

Establishment of the Working Group on Life-Saving Appliances (LSA)

3.7 Following the above decisions, the Sub-Committee established the Working Group on Life-Saving Appliances (LSA) and instructed it, taking into account the comments made and decisions taken in plenary, to:

- .1 develop goals, functional requirements and expected performance to ensure the consistent application of SOLAS regulations III/4.3 (novel life-saving appliances or arrangements) and III/38 (Alternative design and arrangements) and the *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212) following the principles provided in document SSE 5/3/1, based on document SSE 4/WP.3 and taking into account documents SSE 5/3, SSE 5/3/2 and SSE 5/INF.7, and also following the principles in paragraph 12.13 of document MSC 98/23 for the description of the necessary function of the draft functional requirements (expected performance) in quantitative terms; and
- .2 consider whether it is necessary to establish a correspondence group and, if so, prepare terms of reference for consideration by the Sub-Committee.

Report of the LSA Working Group

3.8 Having considered the part of the report of the LSA Working Group (SSE 5/WP.3) dealing with this agenda item, the Sub-Committee noted that the Group identified differences in the presentation of functional requirements and expected performance provided in document SSE 5/INF.7 versus those presented in annex 1 of document SSE 4/WP.3, and that those differences would best be resolved by conducting a gap analysis between those two documents, to be undertaken intersessionally by a correspondence group.

Re-establishment of the Correspondence Group on Life-Saving Appliances

3.9 Having considered the above matters and in order to progress the work intersessionally, the Sub-Committee re-established the Correspondence Group on Life-Saving Appliances, under the coordination of Norway* and the United States*, and instructed it (see also paragraphs 4.8, 6.17 and 14.9), taking into account the comments made and decisions taken at SSE 5, to:

- .1 compare annex 1 of document SSE 4/WP.3 with document SSE 5/INF.7 and resolve any differences;
- .2 reach an agreement on the format of the presentation of the functional requirements;
- .3 verify the completeness of the functional requirements by reviewing the LSA Code and make adjustments as necessary;

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- .4 further develop expected performances with a view to finalizing the functional requirements;
- .5 develop draft amendments to MSC.1/Circ.1212, following the principles provided in document SSE 5/3/1 and based on annex 4 to document SSE 4/WP.3; and
- .6 submit a report to SSE 6.

4 DEVELOP NEW REQUIREMENTS FOR VENTILATION OF SURVIVAL CRAFT

General

4.1 The Sub-Committee recalled that MSC 97, taking into account that the proposal for this output (MSC 97/19/8 and MSC 97/INF.11) originally addressed totally enclosed lifeboats only and that the compelling need had been demonstrated for such equipment, had agreed that the Sub-Committee should develop requirements related to the ventilation of totally enclosed lifeboats with the highest priority and, thereafter, consider requirements for other survival craft.

4.2 The Sub-Committee also recalled that SSE 4, having considered matters related to the methods of ventilation of survival craft and that additional research and experience data related to the microclimate inside totally enclosed lifeboats would be helpful in order to reach a conclusion with regard to the ventilation flow to be included in the draft amendments, agreed to re-establish the Correspondence Group on Life-Saving Appliances (LSA) with terms of reference as set out in paragraph 14.9 of document SSE 4/19.

Report of the LSA Correspondence Group

4.3 The Sub-Committee considered the report of the LSA Correspondence Group (SSE 5/4) and, having approved it in general, noted that the group had:

- .1 considered whether a habitable environment inside the totally enclosed lifeboat should be maintained by prescribing microclimate parameters or ventilation or air exchange rates;
- .2 considered how long a habitable environment should be maintained, particularly with reference to the time of rescue; and
- .3 made progress regarding the draft amendments to the LSA Code, taking into account sub-paragraphs .1 and .2 above.

4.4 In the context of the above, the Sub-Committee also had for its consideration document SSE 5/4/1 (China), commenting on the report of the Correspondence Group (SSE 5/4) regarding the development of new requirements for ventilation of survival craft, in particular, proposing that:

- .1 data from academic research documents of coalmine exploitations and manned submersibles be considered;
- .2 the minimum oxygen content and the maximum carbon dioxide content, together with a minimum of 24 h sustainable period of habitable microclimate, could be regarded as the criteria for a new ventilation requirement in totally enclosed lifeboats; and

-
- .3 a new paragraph be introduced in the LSA Code to require proper distances between the engine exhaust outlet and the ventilation openings.

4.5 During the consideration of the report of the Correspondence Group and document SSE 5/4/1, the Sub-Committee noted the following general comments:

- .1 the work on this output should focus on ensuring safety and survivability, rather than comfort, in totally enclosed lifeboats on board ships operating outside polar waters;
- .2 any additional requirements for ships operating in polar waters should be addressed under agenda item 6 (Consequential work related to the new Code for ships operating in polar waters);
- .3 criteria for ventilation without prescriptions on the method to meet such criteria, i.e. active or passive, should be finalized at this session;
- .4 the draft amendments to provide habitable microclimates should be based on ventilation rates due to the fact that specific air quality requirements such as CO₂ and O₂ concentration limits would require complex tasks and verification processes;
- .5 as CO₂ concentration was the first parameter to be considered in a dangerous environment in a totally enclosed lifeboat, it should be taken into account when prescribing a habitable environment;
- .6 the work on this output to date had not taken into consideration CO levels, which should be detected as they might rise in case of leakage of an exhaust gas system;
- .7 considerations such as the volume of the totally enclosed lifeboat or the method of ventilation should assist in determining how long a habitable microclimate should be sustained, with a minimum of 24 h, which was similar to the engine endurance provisions of the LSA Code; and
- .8 taking into account the human body physiology, five days of breathable atmosphere should be agreed.

4.6 In considering the actions requested in paragraph 25 of the report of the Correspondence Group (SSE 5/4), the Sub-Committee approved the report in general and, taking into account the views expressed in paragraph 4.5 above, agreed that:

- .1 for totally enclosed lifeboats, the ventilation/air exchange rate based on microclimate parameters should be the criterion set out in the draft amendments to the LSA Code without precluding either active or passive ventilation methods; and
- .2 a habitable environment should be maintained for a period of time of not less than 24 h for lifeboats, in general, while a longer period may be required for survival craft of ships operating in polar waters.

4.7 In light of the foregoing, the Sub-Committee instructed the LSA Working Group to further consider the above-mentioned matters in the context of the preparation of amendments to the LSA Code.

Instructions to the LSA Working Group

4.8 The Sub-Committee instructed the LSA Working Group, established under agenda item 3 (see paragraph 3.7), taking into account comments made and decisions taken in plenary, to:

- .1 finalize draft amendments to the LSA Code based on document SSE 5/4 and taking into account document SSE 5/4/1;
- .2 if time permits, consider amendments to the *Revised recommendation on testing of life saving appliances* (resolution MSC.81(70)) and any necessary consequential amendments to other IMO instruments, taking into account annexes 1 and 2 to document SSE 5/4, and advise the Sub-Committee accordingly; and
- .3 consider whether it is necessary to establish a correspondence group to develop new requirements for ventilation of survival craft other than totally enclosed lifeboats and, if so, prepare terms of reference for consideration by the Sub-Committee.

Report of the LSA Working Group

4.9 Having considered the part of the report of the LSA Working Group (SSE 5/WP.3) dealing with this agenda item, the Sub-Committee took action as outlined below.

Draft amendments to the LSA Code regarding ventilation on totally enclosed lifeboats

4.10 The Sub-Committee, having noted the following views of the group:

- .1 the CO₂ concentration was the determining parameter for ventilation requirements and should not exceed 5,000 ppm, which required a ventilation rate of at least 5 m³/h per person;
- .2 in order to ensure the ventilation power, sufficient fuel should be provided to allow for 24 h of ventilation and, at the same time, run the fully loaded lifeboat at 6 knots for a period of not less than 24 h; and
- .3 the new ventilation requirements should apply to all new-built totally enclosed lifeboats installed on board a ship after the enter-into-force date of the amendments,

agreed to the draft amendments to the LSA Code, as set out in annex 1 of document SSE 5/WP.3, for eventual submission to the Committee for approval once the related amendments to the LSA Code regarding ventilation on survival craft other than totally enclosed lifeboats were finalized.

Instructions to the LSA Correspondence Group

4.11 Having considered the above matters and in order to progress the work intersessionally, the Sub-Committee instructed the LSA Correspondence Group, established under agenda item 3 (see paragraphs 3.9 and 14.9), taking into account the comments made and decisions take in plenary, to:

- .1 review data on microclimates as referenced in annexes 1 and 2 to document SSE 5/4 and document SSE 5/4/1 with respect to survival craft and data from other sources deemed reliable and relevant;
- .2 based on that review and taking into consideration the expected performance established for totally enclosed lifeboats, identify and recommend the possible criteria for new ventilation requirements for survival craft other than totally enclosed lifeboats;
- .3 recommend the criteria to be used for ventilation requirements for survival craft other than totally enclosed lifeboats;
- .4 prepare the draft amendments to the LSA Code, chapter IV, on ventilation requirements for survival craft other than totally enclosed lifeboats; and
- .5 prepare draft amendments to resolution MSC.81(70) for the testing of the means of ventilation for all survival craft and the necessary consequential amendments to other IMO instruments, based on annex 2 to document SSE 4/14, taking into consideration the safe operational conditions that may allow lifeboat hatches to be opened for ventilation.

Extension of the target completion year

4.12 In light of the above decisions, the Sub-Committee invited the Committee to extend the target completion year for this output to 2019.

5 UNIFORM IMPLEMENTATION OF PARAGRAPH 6.1.1.3 OF THE LSA CODE

General

5.1 The Sub-Committee recalled that SSE 4, having noted the concerns expressed regarding the hazards that the draft amendment to the LSA Code would introduce if the launching phase of a rescue boat from the stowed position to the outboard position was to be allowed without the number of persons assigned to crew the rescue boat on board, had endorsed the draft amendment to paragraph 6.1.1.3 of the LSA Code and had invited MSC 98 to approve them with a view to subsequent adoption.

5.2 In this regard, the Sub-Committee noted that MSC 98, having noted that the concerns expressed at SSE 4 had been reiterated, as well as a number of views related to the scope of application of the amendment, had instructed the Sub-Committee to further consider the draft amendment to paragraph 6.1.1.3 of the LSA Code, taking into account the above-mentioned comments, and advise the Committee accordingly (MSC 98/23, paragraphs 12.22 and 12.23).

Draft amendment to the LSA Code

5.3 The Sub-Committee had for its consideration the following documents:

- .1 SSE 5/5 (Bahamas, Norway and Republic of Korea), proposing to add that manually-launched rescue boats should be provided with means for bringing and holding the craft against the ship's side so that persons can embark safely, which is a provision currently applicable to lifeboats and liferafts (SOLAS regulation III/11.8);
- .2 SSE 5/5/1 (Japan), providing a draft amendment to paragraph 6.1.1.3 of the LSA Code intended to allow for the use of hand-operated mechanisms for

launching rescue boats that are not one of the lifeboats prescribed by SOLAS, taking into account the concerns expressed at MSC 98 (MSC 98/23, paragraph 12.22) and, in particular:

- .1 the need to introduce the mass of the persons assigned to crew the rescue boat in the draft amendment in order to address the requirement for passenger ships to board the boat and launch it directly from the stowed position;
 - .2 that the amendment should apply to both passenger and cargo ships; and
 - .3 that the application of the amendment be based on the installation date of the equipment; and
- .3 SSE 5/5/2 (Japan), providing comments on the amendment to paragraph 6.1.1.3 of the LSA Code, contained in document SSE 5/5 and, in particular that, although the inclusion of the new requirement proposed in the referred document, i.e. provide means for bringing and holding a manually launched rescue boat alongside the ship in order for the persons to safely embark/disembark, would prevent the safety hazard caused by boarding a rescue boat after the boat has been swung outboard (MSC 98/23, paragraph 12.22), such a requirement should be included in SOLAS chapter III rather than in the LSA Code, since this inclusion was outside the scope of this output.

5.4 In the ensuing discussion, the Sub-Committee noted the following views expressed:

- .1 the Sub-Committee should follow the instruction of MSC 98 (see paragraph 5.2 above) in order to address the concerns raised at that session of the Committee;
- .2 the new provision in the LSA Code should not apply to passenger ships;
- .3 the additional requirement for bringing the rescue boat against the ship's side and holding it alongside so that persons can be safely embarked provides the necessary safeguard to avoid further risks;
- .4 if the maximum allowable mass was to be increased, as proposed in document SSE 5/5/1, without adjusting either the force on the crank handle or the maximum crank radius, the manual operation speed and, consequentially, the level of safety would be reduced; and
- .5 the whole launching procedure of the rescue boat should not be included in the new provision, which should be addressed in the safety management system and the training manual.

5.5 Taking into account that the new provision of the LSA Code would allow for rescue boat arrangements that were not permitted so far, the Sub-Committee agreed that an application date based on the installation date of the equipment was unnecessary.

Instructions to the LSA Working Group

5.6 Consequently, the Sub-Committee further instructed the LSA Working Group established under agenda item 3 (see paragraph 3.7), taking into account comments made and decisions taken in plenary, to finalize the draft amendment to paragraph 6.1.1.3 of the LSA Code, taking into account document SSE 5/5.

Report of the LSA Working Group

5.7 Having considered the part of the report of the LSA Working Group (SSE 5/WP.3) dealing with the agenda item, the Sub-Committee agreed to the draft amendments to paragraph 6.1.1.3 of the LSA Code regarding manual launching of rescue boats, as set out in annex 1, for submission to MSC 100 for approval and subsequent adoption.

Completion of the work on the output

5.8 The Sub-Committee invited the Committee to note that the work on the output had been completed.

6 CONSEQUENTIAL WORK RELATED TO THE NEW CODE FOR SHIPS OPERATING IN POLAR WATERS

GENERAL

6.1 The Sub-Committee recalled that it had been instructed by MSC 97 (MSC 97/22, paragraph 8.30) to:

- .1 review the LSA Code and the relevant IMO resolutions to adapt current testing and performance standards to the Polar Code provisions or develop additional requirements, if necessary. In this regard, the application should only address life-saving appliances in polar waters when required by the relevant application requirements in the Polar Code (all ships, ships intended to operate in low air temperature, ship ice classes in accordance with chapter 3, etc.); and
- .2 develop guidance on extinguishing media at polar service temperatures (PST) and consider any necessary amendments to current standards for fire-fighters' outfits.

6.2 The Sub-Committee also recalled that SSE 4 had endorsed the draft work plan to address additional requirements related to life-saving appliances and arrangements on board ships operating in polar waters, as prepared by the LSA Working Group (SSE 4/WP.3, paragraph 35); invited interested delegations and international organizations to submit proposals regarding the development of guidance on extinguishing media at PST; and to consider any necessary amendments to current standards for fire-fighters' outfits in line with the original instructions of MSC 97.

6.3 The Sub-Committee further recalled that SSE 4, in order to progress the work intersessionally, had instructed the LSA Correspondence Group to submit a report to this session according to the terms of reference set out in paragraph 15.9 of document SSE 4/19.

REPORT OF THE LSA CORRESPONDENCE GROUP

6.4 The Sub-Committee considered the part of the report of the LSA Correspondence Group (SSE 5/4) dealing with this agenda item and, in particular, noted that the group:

- .1 had developed a list of specific conditions and performance criteria for life-saving appliances and arrangements in the polar environment, which needed further consideration, and agreed that this work was subject to the development of test and performance criteria for life-saving appliances and arrangements on board ships operating in polar waters;
- .2 had agreed that, notwithstanding the minimum time of rescue prescribed by the Polar Code, only the fact of holding a Polar Ship Certificate does not entail special life-saving appliances and arrangements' requirements beyond the LSA Code;
- .3 had prepared a draft matrix of test and performance criteria for life-saving appliances and arrangements specific for the polar environment; and
- .4 having agreed that the requirements for polar life-saving appliances and arrangements should not inadvertently impose mandatory requirements on life-saving appliances and arrangements not intended for ships operating in polar waters, had considered different options for the regulatory framework to address conditions, test and performance criteria, such as an MSC resolution, the development of ISO standards or amendments to the Polar Code or the LSA Code.

6.5 The Sub-Committee also considered document SSE 5/6 (Norway), which, while expressing the view that any additional performance and/or test standards should, similarly to the Polar Code, be add-ons to existing instruments in order to eliminate the possibility of unintentionally affecting equipment used elsewhere, contained a proposal for "Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters", in line with the work plan agreed at SSE 4 (SSE 4/WP.3, paragraph 35). As proposed, the Interim guidelines would address the urgency of the matter as any long-term solution would not enter into force before 1 January 2024, at the earliest.

6.6 Furthermore, the Sub-Committee noted the information contained in document SSE 5/INF.3 (Norway) about the SARex II exercise, which was a follow-up to SARex I, including a link to the complete report.

6.7 In considering the report of the Correspondence Group and document SSE 5/6, the Sub-Committee noted the following views expressed:

- .1 the Polar Code had already entered into force and the real challenges posed by the polar environment had made it necessary to finalize the testing and performance standards for life-saving appliances and arrangements on ships operating in polar waters as soon as possible;
- .2 the finalization of Interim guidelines would contribute to the global and consistent implementation of the Polar Code;
- .3 the Interim guidelines should be organized so as to ensure that the application of each provision is subject to the operational assessment in order to mitigate the identified hazards;

- .4 the work on this output should not depart from the goal-based approach of the Polar Code in order to address the range of operations in polar regions; and
- .5 some of the performance standards under development might be generally applicable to life-saving appliances and arrangements.

6.8 The Sub-Committee also noted the information provided by the observer from ISO regarding the ongoing work that ISO was conducting in order to support the implementation of the Polar Code. In this regard, the Sub-Committee noted that ISO/TC 8 had already developed polar standards, such as ISO 18215 on "Ships and marine technology – Vessel machinery operations in polar waters – Guidelines" and that ISO is currently working on identifying further suitable areas for ISO standards. The observer from ISO encouraged delegations to assist in the process of developing standards that might be relevant to the Polar Code.

6.9 Following the above discussion, the Sub-Committee:

- .1 agreed that the specific conditions and test and performance criteria for life-saving appliances and arrangements intended for use in polar waters required further consideration by a working group;
- .2 noted the Correspondence Group's understanding that the fact of holding a Polar Ship Certificate alone did not in itself entail compliance with special life-saving appliances and arrangements' requirements beyond the LSA Code;
- .3 agreed that the methods related to the regulatory framework to address conditions, test and performance criteria required further consideration by a working group; and
- .4 agreed that Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters had to be developed due to the urgency of the matter.

INSTRUCTIONS TO THE LSA WORKING GROUP

6.10 Consequently, the Sub-Committee instructed the LSA Working Group, established under agenda item 3 (see paragraph 3.7), taking into account comments made and decisions taken in plenary, to:

- .1 finalize the specific conditions and test and performance criteria for life-saving appliances and arrangements on board ships operating in polar waters, taking into account annexes 2, 4 and 5 to document SSE 5/4 and document SSE 4/INF.4;
- .2 if time permits, consider suitable regulatory options to address new test and performance criteria, taking into account document SSE 5/4, and advise the Sub-Committee accordingly;
- .3 finalize the draft Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters, as the highest priority, based on document SSE 5/6; and

- .4 consider whether it is necessary to establish a correspondence group and, if so, prepare terms of reference, taking into account the work plan set out in paragraph 35 of document SSE 4/WP.3, for consideration by the Sub-Committee.

REPORT OF THE LSA WORKING GROUP

6.11 Having considered the part of the report of the LSA Working Group (SSE 5/WP.3) dealing with this agenda item, the Sub-Committee took action as outlined in paragraphs 6.12 to 6.17 below.

Development of Interim guidelines

6.12 The Sub-Committee noted the progress made by the Group on the development of the draft Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters, particularly on the following assessment criteria:

- .1 maximum expected time of rescue;
- .2 operation in low-air temperatures (ships with an assigned PST);
- .3 operation in ice;
- .4 icing of life-saving appliances and arrangements;
- .5 the effect of operation in high latitudes;
- .6 operation in extended periods of darkness; and
- .7 abandonment onto ice or land.

6.13 However, the Sub-Committee also noted the difficulties encountered by the Group during its deliberations, as set out in paragraphs 24 and 25 of document SSE 5/WP.3, which prevented it from finalizing the draft Interim guidelines at this session.

6.14 Consequently, the Sub-Committee concurred with the Group's recommendation to progress the work on the draft Interim Guidelines intersessionally via a correspondence group (see paragraph 6.17).

Specific conditions and regulatory options to address test and performance criteria

6.15 The Sub-Committee noted the Group's consideration of the specific conditions, test and performance criteria for life-saving appliances and arrangements on board ships operating in polar waters and that they could be annexed to the draft Interim guidelines.

6.16 In considering the regulatory options to address new test and performance criteria, the Sub-Committee endorsed the group's view that these should be decided after the finalization of the specific conditions and test and performance criteria and the draft Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters.

GUIDANCE ON EXTINGUISHING MEDIA AT POLAR SERVICE TEMPERATURES (PST) AND AMENDMENTS TO CURRENT STANDARDS FOR FIRE-FIGHTERS' OUTFITS

6.17 The Sub-Committee noted that no documents had been submitted to this session to either develop guidance on extinguishing media at PST or consider any necessary amendments to current standards for fire-fighters' outfits.

INSTRUCTIONS TO THE LSA CORRESPONDENCE GROUP

6.18 Having considered the above matters and the recommendations of the LSA Working Group, the Sub-Committee instructed the LSA Correspondence Group established under agenda item 3 (see paragraphs 3.9 and 14.9), taking into account the comments made and decisions taken at SSE 5, to:

- .1 further develop, with a view towards finalization, the draft Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters, based on annexes 3 and 4 to document SSE 5/WP.3, taking into account annexes 2, 4 and 5 to document SSE 5/4 and document SSE 4/INF.4; and
- .2 consider suitable regulatory options to address future new test and performance criteria, e.g. a new chapter of the LSA Code, amendments to MSC.81(70), amendments to the Polar Code part I-B or a standalone resolution/circular.

7 REVIEW SOLAS CHAPTER II-2 AND ASSOCIATED CODES TO MINIMIZE THE INCIDENCE AND CONSEQUENCES OF FIRES ON RO-RO SPACES AND SPECIAL CATEGORY SPACES OF NEW AND EXISTING RO-RO PASSENGER SHIPS

GENERAL

7.1 The Sub-Committee recalled that SSE 4 had endorsed that the method of work to review SOLAS chapter II-2 and associated codes should generally follow a risk-based methodology, such as Formal Safety Assessment (FSA), or, where relevant, similar but simplified techniques, or the adoption of the existing best practice.

7.2 It was also recalled by the Sub-Committee that SSE 4 had agreed on the following two-step approach:

- .1 the development of the Interim guidelines; and
- .2 the development of amendments to SOLAS chapter II-2 and associated codes.

7.3 The Sub-Committee noted that MSC 98 had agreed that the review of SOLAS chapter II-2 and associated codes could consequentially lead to the development of amendments to SOLAS chapters II-2 and III, the FSS Code, the 2010 FTP Code, the STCW Convention and Code and relevant guidelines and, therefore, the development of such consequential amendments should not require a proposal for a new output.

7.4 The Sub-Committee also noted that MSC 98 had approved the scope of work for, and the work plan on, the review of SOLAS chapter II-2 and associated codes regarding ro-ro spaces and special category spaces of new and existing ro-ro passenger ships, as set out in

annexes 13 and 14 to document SSE 4/19, respectively, which had been prepared following the instructions of MSC 97.

DEVELOPMENT OF DRAFT AMENDMENTS TO SOLAS CHAPTER II-2 AND ITS ASSOCIATED CODES AND NEW INTERIM GUIDELINES

7.5 With regard to proposals for draft amendments to SOLAS and its associated codes, and the development of new Interim guidelines, the Sub-Committee had the following documents for its consideration:

- .1 SSE 5/7 (Japan), providing the results of the deliberation of Japanese stakeholders on the effective risk control options (RCOs), including risk control measures (RCMs) classified according to the five tasks approved at MSC 98 (MSC 98/23, paragraph 12.42.2), taking into account the procedures of the Formal Safety Assessment (FSA) methodology and with an emphasis on the identified hazards; and key issues for fire safety measures for ro-ro spaces and special category spaces of new and existing passenger ships;
- .2 SSE 5/7/1 (Austria et al.), containing a proposal to develop guidelines on appropriate measures regarding the increased fire risk caused by the transport of electrically powered vehicles and reefer units, as well as other alternatively driven vehicles;
- .3 SSE 5/7/2 (Austria et al.), proposing specific measures regarding electrical connections to vehicles and cargo units aiming to lower the occurrence rate of fires in ro-ro and special category spaces of both new and existing ro-ro passenger ships, as far as practicable, with a view to develop: draft amendments to SOLAS chapter II-2; draft new guidelines, or draft amendments to the FSS Code; and draft amendments to the *Survey guidelines under the harmonized system of survey and certification (HSSC), 2017* (resolution A.1120(30));
- .4 SSE 5/7/4 (China), proposing to consider the following fire safety measures in subsequent SOLAS and related codes' revisions in the context of control plans for reducing fire risks in ro-ro spaces and special category spaces specific to ships carrying electric vehicles powered by lithium-ion batteries, based on the fact that the fire risk characteristics of electric vehicles powered by lithium-ion batteries are different from those of conventional vehicles:
 - .1 remotely controlled or automatic positioned additional fire-extinguishing measures similar to fire monitors, including drainage systems;
 - .2 electric vehicles powered by lithium-ion batteries should be stored separately from conventional vehicles on board ships so that appropriate fire safety and management measures may be taken; and
 - .3 before effective fire control measures are in place, develop relevant requirements for electric vehicles powered by lithium-ion batteries carried on ships; and
- .5 SSE 5/7/5 (China), proposing that the following fire safety measures be considered for the subsequent revision of SOLAS and related codes when

reviewing the control option of minimizing the fire risk of ro-ro spaces and special category spaces:

- .1 skid-resistant materials applied on decks of ro-ro spaces and special category spaces should be in line with the requirements of SOLAS regulation II-2/6.2.1 for paints, varnishes and other finishes;
- .2 ensure minimum distances between the nozzle and the vehicle or the maximum protection area for which the pressure water spraying fire-extinguishing system nozzle can play its role effectively;
- .3 based on existing SOLAS regulation II-2/20.3.1.5, permanent openings should not be fitted within certain distances forward and aft in the side bulkhead of ro-ro spaces below life-saving appliances, taking into account SOLAS chapter III; and
- .4 ro-ro spaces and special category spaces should be divided into several zones, which should be locally protected by a combination of area fire detection and local fire extinguishment, in addition to the provision of total flooding fixed fire-extinguishing systems.

7.6 In addition, the Sub-Committee noted with appreciation the information provided in the following documents:

- .1 SSE 5/INF.4 (Austria et al.), providing information from several studies that were directly relevant to the items identified in the approved scope of work for this output, in particular, from the study contained in the annex to document SSE 4/INF.6 (EC) and the studies presented in documents SSE 2/INF.3 (Germany) and MSC 96/INF.3 (Germany). The document focuses on matters such as electrical fire as an ignition risk; fire risk related to the transport of electrically powered vehicles, including fuel cells, and vehicles with refrigeration units on ro-ro and ro-ro passenger ships; fire growth mechanisms; and the impact of "early" or "late" decision on the fire growth rate;
- .2 SSE 5/INF.5 (Japan), providing information on the guidelines for establishing fire-fighting strategies of individual ro-ro passenger ships, which were published by the Committee for Prevention of Fire on Ro-Ro Passenger Ships organized by the Maritime Bureau of Japan in March 2016; and
- .3 SSE 5/INF.6 (China), introducing the use of a fixed CO₂ fire-extinguishing system in ro-ro spaces of Chinese ro-ro passenger ships engaged in domestic coastal voyages, highlighting the advantages of such systems compared to water-spraying systems in ro-ro and special category spaces.

7.7 In considering the above documents, the Sub-Committee noted the following views expressed during the discussion:

- .1 the identification of hazards and risk control measures should be used to develop interim guidelines and draft amendments to SOLAS and associated codes;
- .2 key issues for safety and risk control measures (SEE 5/7) provided a useful input; however, smoke extraction as a fire-fighting strategy, as well as the

- lack of risk control measures associated with fire "containment" in ro-ro spaces and special category spaces, raised some concerns;
- .3 smoke extraction in cases of fire in ro-ro spaces and special category spaces represented a complex and comprehensive fire-fighting strategy, which embraced different areas including training, and the strategy as presented might be inconsistent with the principles associated with the "fire triangle", as well as ineffective in open ro-ro spaces;
 - .4 the retrofit of electrical connection boxes as a result of the work on this output should be carefully considered as there were differing electrical connection configurations in ro-ro spaces and special category spaces;
 - .5 not all lithium-ion batteries had the same behaviour in cases of compression, collision, overcharge/discharge or short circuit and, therefore, different safety measures might be necessary with regard to the carriage of electric vehicles powered by lithium-ion batteries;
 - .6 for fires involving electric vehicles powered by lithium-ion batteries, the supply of large quantities of water was an effective measure to cool down the batteries in order to reduce the temperature and extinguish the fire;
 - .7 the use of CO₂ fixed fire-extinguishing systems in special category spaces should be carefully considered, taking into account that SOLAS regulation II-2/20.6.1.2 required that said spaces be fitted with a fixed water-based fire-fighting system complying with the provisions of the FSS Code;
 - .8 the Human Element, Training and Watchkeeping (HTW) Sub-Committee should not be requested to take any actions with regard to training issues until after the draft amendments are finalized; and
 - .9 taking into account that the FIRESAFE II study was expected to be finalized later that year and that it would provide additional input to the work on this output, an extension of its target completion year to 2020 should be considered.

7.8 Taking into account the above views, the Sub-Committee agreed that the draft interim guidelines to be developed at this session should not be limited to the transport of electrically powered vehicles and reefer units and their connection to the ship's electrical supply.

DRAFT AMENDMENTS TO THE REVISED GUIDELINES FOR THE DESIGN AND APPROVAL OF FIXED WATER-BASED FIRE-FIGHTING SYSTEMS FOR RO-RO SPACES AND SPECIAL CATEGORY SPACES (MSC.1/CIRC.1430)

7.9 The Sub-Committee considered the following documents containing proposals related to the *Revised guidelines for the design and approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces* (MSC.1/Circ.1430):

- .1 SSE 5/7/3 (IACS), proposing to evaluate the need for amending the Revised guidelines in order to specify how full control of the fixed water-based fire-fighting systems from a single room outside the protected space can be achieved; and

- .2 SSE 5/7/6 (CESA), providing comments on document SSE 5/7 and addressing issues within the Revised guidelines concerning sprinklers and nozzles that may not ensure undisturbed spray when installed in the underside of the deck of ro-ro ships with stiffeners with a height of more than 0.6 m in accordance with the Revised guidelines.

7.10 In the ensuing discussion, the Sub-Committee noted the following comments:

- .1 both documents provided sensible proposals to amend the Revised guidelines;
- .2 nozzles of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces should not be exposed to damage during loading and unloading operations; and
- .3 the horizontal distance between nozzles should not be overly prescriptive, taking into account its impact on the effective operation of the system.

7.11 Subsequently, the Sub-Committee agreed to instruct the Working Group on Fire Protection (FP) to prepare draft amendments to the Revised guidelines, taking into account documents SSE 5/7/3, SSE 5/7/5 and SSE 5/7/6 and advise the Sub-Committee accordingly.

ESTABLISHMENT OF THE FP WORKING GROUP

7.12 Having considered the above matters, the Sub-Committee established the Working Group on Fire Protection (FP) and instructed it, taking into account the comments made and decisions taken in plenary, to:

- .1 provisionally identify which fire safety provisions of SOLAS and related instruments need to be revised, taking into account the scope of work set out in annex 13 to document SSE 4/19 and all the documents submitted to this session;
- .2 based on the identification of fire safety provisions in sub-paragraph .1 above, consider the scope and structure of the draft interim guidelines, taking into account documents SSE 5/7, SSE 5/7/1, SSE 5/7/2, SSE 5/7/4, SSE 5/7/5, SSE 5/INF.4, SSE 5/INF.5 and SSE 5/INF.6, and advise the Sub-Committee accordingly;
- .3 based on the identification of fire safety provisions in sub-paragraph .1 above, proceed with the development of draft amendments to SOLAS and related instruments, taking into account documents SSE 5/7, SSE 5/7/2, SSE 5/7/4, SSE 5/7/5, SSE 5/INF.4, SSE 5/INF.5 and SSE 5/INF.6;
- .4 with regard to training issues, consider what actions, if any, need to be taken by HTW 5, taking into account annexes 13 and 14 to document SSE 4/19, and advise the Sub-Committee accordingly;
- .5 prepare draft amendments to the *Revised guidelines for the design and approval of fixed water based fire-fighting systems for ro-ro spaces and special category spaces* (MSC.1/Circ.1430), taking into account documents SSE 5/7/3, SSE 5/7/5 (paragraphs 7 to 9) and SSE 5/7/6; and

- .6 consider whether it is necessary to establish a correspondence group and, if so, prepare terms of reference, taking into account the work plan set out in annex 14 of document SSE 4/19, for consideration by the Sub-Committee.

REPORT OF THE FP WORKING GROUP

7.13 Having considered the part of the report of the Working group on Fire Protection (SSE 5/WP.4) dealing with this agenda item, the Sub-Committee approved it in general and took action as outlined in paragraphs 7.14 to 7.20 below.

Identification of the provisions that may need to be revised

7.14 The Sub-Committee approved the list of provisionally identified IMO instruments that might need to be revised to minimize the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships, including those under the purview of the Sub-Committees on Carriage of Cargoes and Containers (CCC) and HTW, as set out in annex 1 to document SSE 5/WP.4.

Development of interim guidelines

7.15 With regard to the Group's discussion on the development of guidelines for minimizing the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships, the Sub-Committee considered the provisional structure for the draft Interim guidelines proposed by the Group, which lists, for each section of the draft Interim guidelines, the relevant document reference to be used as the basis for the guidelines' text, and approved the provisional structure set out in annex 2 to document SSE 5/WP.4.

Draft amendments to the 1974 SOLAS Convention and related instruments

7.16 The Sub-Committee noted that, due to time constraints, the Group was unable to commence identifying and amending fire safety provisions in SOLAS chapter II-2 and associated codes.

Draft amendments to MSC.1/Circ.1430

7.17 The Sub-Committee agreed to the draft MSC circular on Amendments to the Revised guidelines for the design and approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces (MSC.1/Circ.1430), as set out in annex 2, for submission to MSC 100 for approval.

Training issues and actions to be taken by the HTW Sub-Committee

7.18 The Sub-Committee noted that the Group could not prepare specific instructions on training issues and action to be taken by the HTW Sub-Committee without having, at least, initial draft amendments to SOLAS chapter II-2 and associated codes.

7.19 In this context, the following views were noted by the Sub-Committee:

- .1 the lack of training of crew in extinguishing fires on ro-ro decks carrying gas and electrically driven cars was obvious, as demonstrated by the incident referred to by Japan in document SSE 5/7, and should therefore be considered by the HTW Sub-Committee;

- .2 while a need for training of crews in respect to extinguishing fires on ro-ro decks was evident, the specific training requirements could not be decided upon at that stage; and
- .3 even if specific training requirements could not be identified at that stage, as some delegations suggested, the HTW Sub-Committee should still be involved as it would be in the position to advise on how best to proceed on this issue.

7.20 Following discussion and recalling that the HTW Sub-Committee, due to the potential inherent training needs, had been assigned as associated organ for this output, the Sub-Committee agreed that it was premature to request the HTW Sub-Committee to consider this issue.

RE-ESTABLISHMENT OF THE FP CORRESPONDENCE GROUP

7.21 Having considered the above matters and the recommendations of the FP Working Group, the Sub-Committee re-established the Correspondence Group on Fire Protection (FP), under the coordination of Japan,* and instructed it, taking into account the comments made and decisions taken at SSE 5 (SSE 5/WP.4 and SSE 5/17), to:

- .1 develop draft interim guidelines for minimizing the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships;
- .2 develop draft amendments to the 1974 SOLAS Convention and associated codes, taking into account their application to existing ships;
- .3 identify other related instruments which need to be consequentially amended; and
- .4 submit a report to SSE 6.

8 AMENDMENTS TO THE FSS CODE FOR CO₂ PIPELINES IN UNDER-DECK PASSAGEWAYS

General

8.1 The Sub-Committee recalled that SSE 4, following consideration of the report of the Working Group on Fire Protection (SSE 4/WP.5), had noted the concerns expressed regarding the practicality of the proposed amendments, as well as the absence of any submitted information about casualty incidents related to fixed fire-extinguishing system lines and the cost of welded joints of pipelines conveying fire-extinguishing media.

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8.2 It was also recalled by the Sub-Committee that SSE 4 had agreed that there was no need to further proceed with amendments to the FSS Code for fire-extinguishing medium pipes in under-deck passageways at that stage and had noted that interested delegations might submit information regarding incidents related to fixed fire-extinguishing system lines, practical experience in using welded pipes on board large cargo ships and cost analysis of welded connections for consideration by the Sub-Committee.

Draft amendments to the FSS Code

8.3 The Sub-Committee had for its consideration document SSE 5/8 (China), providing an updated proposal for amendments to chapter 5 of the FSS Code in order to include an additional requirement for fixed gas fire-extinguishing system pipelines in under-deck passageways to be joined only by welding, based on the comments made at SSE 4 and additional research into the reliability and cost of welded joints versus flange connections.

8.4 In connection with the above, the Sub-Committee noted the information provided in document SSE 5/INF.8 (China), containing a report on a statistical analysis of the number of times, reasons and ratio of CO₂ leakages during the ships' release from the CO₂ system. The data was collected from fire casualty investigation reports, which were published on the official website of the related marine investigation authorities.

8.5 In the ensuing discussion, the Sub-Committee noted the following views:

- .1 according to the information provided, the vast majority of incidents concerning CO₂ leakages in fixed gas fire-extinguishing system pipelines took place in the CO₂ room or the protected space; therefore, under-deck passageways did not seem to be generally affected;
- .2 based on the research of incidents, there appeared to be little connection between incidents and fatalities;
- .3 welded joints should be presented as one of the options acceptable within the corresponding requirements of the FSS Code;
- .4 practicality and implications of the proposed amendment should be thoroughly considered and, in particular, the meaning of the term "under-deck passageways" should be specified; otherwise spaces such as engine rooms and ro-ro spaces could be regarded as "under-deck passageways";
- .5 the development of the draft amendments should consider enclosed spaces that needed to be addressed, the different types of pipe joints, the fabrication and sampling procedures of joints and the pressure testing of piping systems, which generally fell within the scope of the rules of classification societies;
- .6 requiring all joints to be welded would increase the total cost of the fixed gas fire-extinguishing system and might increase the risk of gas leakages due to defective welds during fabrication;
- .7 the information provided in document SSE 5/8 did not appear to be realistic with regards to access to, and maintenance of, welded joints in under-deck passageways, where the space was necessarily limited; and

- .8 flange joints entailed very low skilled maintenance and repair tasks compared with welded joints.

8.6 In light of the above views, the Sub-Committee agreed to take no further action on this output.

Completion of the work on the output

8.7 Consequently, the Sub-Committee invited the Committee to note that the work on this output had been completed.

9 AMENDMENTS TO MSC.1/CIRC.1315

General

9.1 The Sub-Committee recalled that, following consideration of document MSC 98/20/8 (Republic of Korea), proposing to amend the *Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk* (MSC.1/Circ.1315) to ensure the capabilities of fixed dry chemical powder fire-extinguishing systems, MSC 98 had agreed to include a new output in the 2018-2019 biennial agenda of the Sub-Committee and the provisional agenda for SSE 5 on "Amendments to MSC.1/Circ.1315", with a target completion year of 2019 (MSC 98/23, paragraphs 20.37 and 20.38).

9.2 It was also recalled by the Sub-Committee that MSC 98 had noted that some delegations had expressed the concern that sodium-based powders should not be included in the proposal as this might reduce the safety level of fire-extinguishing performance owing to clogging. MSC 98 had also noted concerns relating to the deletion of potassium-powder based systems from the Guidelines.

Draft amendments to the Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk (MSC.1/Circ.1315)

9.3 The Sub-Committee had for its consideration the following documents:

- .1 SSE 5/9 (Austria et al.), containing considerations of dry chemical powders to be used in fixed fire-extinguishing systems as provided for in the Guidelines and, in particular, highlighting that, although sodium bicarbonate (NaHCO_3 , baking soda) and potassium bicarbonate (KHCO_3) are very similar powders, potassium bicarbonate dry chemicals are more effective and reliable than sodium bicarbonate-based dry chemical powders, particularly in regard to the protection of ships carrying liquefied gases in bulk. In this connection, taking into account the scientific literature produced over the years, it is suggested that powders based on sodium bicarbonate should not be allowed for use on gas tankers;
- .2 SSE 5/9/1 (Japan), proposing amendments to the Guidelines, in particular not to include sodium bicarbonate powder for fire-extinguishing media owing to its tendency to decompose at relatively low temperatures and the consequent clogging of the pipelines; and the inclusion of references to recognized standards for the approval of dry chemical powder, including its fire-extinguishing capability, and the consequent deletion of redundant parts in the Guidelines;

- .3 SSE 5/9/2 (China), providing a proposal to amend the Guidelines, in particular to clarify the chemical composition in the definition of "dry chemical powder"; to clarify that dry powder should be approved by the Administration according to standard ISO 7202:2012; and amending provisions in paragraph 8.1 (Fluidity test) of the appendix to the Guidelines to ensure the good fluidity of dry powder; and
- .4 SSE 5/9/3 (Republic of Korea), providing an updated proposal to the one included in document MSC 98/20/8 to amend the Guidelines, in particular that:
 - .1 approved dry chemical powders, without specifying composition, be used in fixed dry chemical powder systems and be periodically agitated according to paragraph 7.9.3 of the *Revised guidelines for the maintenance and inspection of fire protection systems and appliances* (MSC.1/Circ.1432); and
 - .2 criteria such as the nominal heat release rate, the test installation requirements or the test procedure be relevant for the fire-extinguishing capability test.

9.4 In considering the above documents, the Sub-Committee noted that the main concerns expressed were related to the use of sodium bicarbonate as a fire-extinguishing medium on ships carrying liquefied gases in bulk owing to the following reasons:

- .1 its tendency to decompose at relatively low temperatures and the consequent clogging of the pipelines; and
- .2 the identified risk of producing gas, which might lead to an unsafe increase of the pressure in the medium's container.

9.5 In light of the foregoing, the Sub-Committee agreed that:

- .1 sodium bicarbonate should be excluded as an acceptable dry chemical powder on ships carrying liquefied gases in bulk;
- .2 dry chemical powder other than sodium bicarbonate should be approved by the Administration in accordance with recognized international standards; and
- .3 a specific fire-extinguishing capability test might be necessary within the Guidelines.

Instructions to the FP Working Group

9.6 Subsequently, the Sub-Committee instructed the FP Working Group, established under agenda item 7 (see paragraph 7.12), taking into account comments made and decisions taken in plenary, to prepare draft amendments to the *Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk* (MSC.1/Circ.1315), taking into account documents SSE 5/9, SSE 5/9/1, SSE 5/9/2 and SSE 5/9/3.

Report of the FP Working Group

9.7 Having considered the part of the report of the FP Working Group (SSE 5/WP.4) dealing with this agenda item, the Sub-Committee took action as outlined in paragraphs 9.8 to 9.11 below.

9.8 The Sub-Committee noted the discussions in the group, including that all dry chemical powders in use were mixtures (containing additives in traces) and that a single compound dry powder did not exist; therefore, it would be necessary to further develop criteria according to which a dry powder could be considered as a sodium bicarbonate powder (e.g. mass percentage of the main compound), as opposed to a sodium-based dry powder.

9.9 The Sub-Committee also noted that the Group considered that the development of draft amendments to the Guidelines was premature due to the lack of expertise within the group, in particular with respect to the testing procedure, and that further input was required from dry chemicals experts.

9.10 The Sub-Committee further noted the issues identified by the Group that needed to be further considered when developing the draft amendments to the Guidelines (SSE 5/WP.4, paragraph 20), which include, but are not limited to:

- .1 testing temperature for the dry powders;
- .2 identification of the lumping and caking temperature of the powders;
- .3 size and shape of the particles;
- .4 moisture behaviour;
- .5 safety concerns of certain mixtures (such as mixing of $\text{NH}_4\text{H}_2\text{PO}_4$, NaHCO_3 or CaCO_3);
- .6 maintenance and servicing requirements;
- .7 mixing ratio of compounds;
- .8 the limits of usage of sodium bicarbonate compounds (in terms of mass percentages);
- .9 characteristics of fires to be extinguished for the fire test;
- .10 establishment of acceptance criteria for extinguishment in the fire test;
- .11 test set-up for the fire test; and
- .12 test procedure.

Instructions to the FP Correspondence Group

9.11 Having considered the above matters and in order to progress the work intersessionally, the Sub-Committee instructed the FP Correspondence Group, established

under agenda item 7 (see paragraph 7.21), taking into account the comments made and decisions taken at SSE 5 (SSE 5/WP.4 and SSE 5/17, section 9), to:

- .1 develop draft acceptance criteria for dry chemical powders in terms of fluidity, moisture behaviour and suitability for use on board ships carrying liquefied gases in bulk, with a view to establishing performance and testing requirements;
- .2 develop draft acceptance criteria for dry chemical powders in terms of fire extinguishing capabilities, with a view to establishing performance and testing requirements; and
- .3 identify available standards and best practices relevant to the maritime sector, as well as possible gaps in the existing international regulations.

10 REQUIREMENTS FOR ONBOARD LIFTING APPLIANCES AND ANCHOR HANDLING WINCHES

General

10.1 The Sub-Committee recalled that SSE 4 had agreed that:

- .1 the new provisions for Onboard Lifting Appliances and Anchor Handling Winches (OLAW) should be included in SOLAS chapter II-1;
- .2 the scope of application of new SOLAS requirements should be based on the installation date of the equipment;
- .3 boundaries for the application of the new SOLAS regulation should be based on the Safe Working Load (SWL) of the appliance;
- .4 a functional requirement addressing a design life of OLAW comparable to that of the ship on which it was installed should not be included;
- .5 a draft functional requirement for inspection and testing should be included; and
- .6 draft guidelines should be further developed without the list of available industry codes and/or standards.

10.2 It was also recalled by the Sub-Committee that SSE 4 had invited MSC 98 to note that the issue of "out of order" or "out of service" OLAW and the validity of a ship's SOLAS certification needed further consideration.

10.3 The Sub-Committee further recalled that SSE 4 had re-established the Correspondence Group on Onboard Lifting Appliances and Anchor Handling Winches, with terms of reference set out in paragraph 8.27 of document SSE 4/19, and had instructed the Group to submit a report to this session.

10.4 The Sub-Committee noted that MSC 98 (MSC 98/23, paragraphs 12.25 to 12.29) had:

- .1 endorsed the work plan to review the development of requirements for onboard lifting appliances and winches, as set out in the annex to document MSC 98/12/5 (Germany); and

- .2 expressed the view that the agreement of SSE 4 regarding which SOLAS chapter should include the new OLAW provisions needed further consideration.

Report of the Correspondence Group and related documents

General

10.5 The Sub-Committee considered the report of the OLAW Correspondence Group (SSE 5/10) and, having approved it in general, noted the progress made on the following matters:

- .1 the goal- and function-based SOLAS regulations, with a particular emphasis on which equipment, including its SWL, should be subject to the new provisions; the scope of application to existing equipment; how to deal with inspection and testing; how to address training and qualification of the ship's crew and shore-based personnel; and how loose gear brought from the shore-side should be treated; and
- .2 the draft guidelines supporting the goals and functional requirements, including the need for a section on design, construction and installation.

10.6 In this context, the Sub-Committee also considered the following documents:

- .1 SSE 5/10/1 (Germany), providing a proposal for the further development of functional requirements in accordance with, and taking into account, the experience gained in the application of the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1) in the context of the ongoing work related to the development of goal- and function-based SOLAS regulations. In this regard, the document provides the results of a hazard identification (HazId), which was conducted considering the main elements of onboard lifting appliances, in order for the functional requirements to address all relevant hazards;
- .2 SSE 5/10/2 (China), providing comments on document SSE 5/10 and, in particular, proposing that:
 - .1 an inclusion list in paragraph 1.2 and an exclusions list in paragraph 1.3 was more appropriate rather than "only an exclusions list as paragraph 1.2";
 - .2 as the competence of the ship's crew was not included in the functional requirements related to the ship structure in the Generic guidelines, it would be sensible to delete the corresponding functional requirement from the draft list of functional requirements (SOLAS regulation II-1/3-13.4.1.8);
 - .3 the provision of operation and maintenance manuals for existing onboard lifting appliances and anchor handling winches should be required after an effective date; and
 - .4 a high-priority discussion should be held to develop interim guidelines for the safety of onboard lifting appliances and anchor handling winches in order to provide an interim technical guidance

for the industry and to allow more practical experience to be gained for the discussion on the final relevant guidelines that would support the goals and functional requirements developed;

- .3 SSE 5/10/3 (IACS), proposing a number of changes to the draft amendments to SOLAS and the draft guidelines, as set out in annexes 1 and 2 of the report of the Correspondence Group (SSE 5/10) and, in particular, addressing:
 - .1 thorough examination, inspection, testing and certification;
 - .2 the inclusion of appropriate definitions for key terms;
 - .3 the need for a list of inclusions with some exclusions, including consideration of equipment-handling personnel;
 - .4 the scope of application of existing lifting appliances; and
 - .5 the unnecessary detailed technical provisions that have been introduced in the draft guidelines for onboard lifting appliances and anchor handling winches;
- .4 SSE 5/10/4 (ICS), commenting on the report of the Correspondence Group on Onboard Lifting Appliances and Anchor Handling Winches contained in document SSE 5/10 (Japan) and, in particular, proposing:
 - .1 to redefine the phrase "repairs, alterations or modification of a major character of an existing onboard lifting appliance or anchor handling winch" in the new SOLAS regulation, with the aim of eliminating any possible ambiguity;
 - .2 options to leave loose gear from the shore-side out of the scope of application of the new SOLAS regulation;
 - .3 to introduce failure mode analysis in the draft guidelines to ensure that the functional performance requirements of the Administration are satisfied; and
 - .4 to eliminate references to the STCW Convention and ISM Code from the draft guidelines to avoid misinterpretation; and
- .5 SSE 5/10/5 (Japan), providing comments on document SSE 5/10 and, in particular, proposing:
 - .1 the inclusion of a definition for "installed on or after [*date*]" in SOLAS regulations II-1/2 and II-1/1.1.1 in order to clarify the application of draft SOLAS regulation II-1/3-13;
 - .2 to set a threshold SWL for the application of the new SOLAS provisions of 1,000 kg in order to avoid imposing impracticable obligations on the industry, Administrations and classification societies, as well as avoiding problems of implementation of draft SOLAS regulation II-1/3-13; and

- .3 to allow some flexibility regarding the approval of SWLs of existing equipment by enabling the use of loads nominated by shipowners or operators where the design loads of the equipment are not known, similarly to the approach in the *Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation* (MSC.1/Circ.1331).

Actions requested by the Correspondence Group

10.7 In considering the report of the Correspondence Group and the above documents, the Sub-Committee noted the following general comments:

- .1 although the goals and functional requirements would constitute a relevant part of the development of new SOLAS regulations, the Sub-Committee should target its efforts at delivering the interim outcome of the development of goals and functional requirements for onboard lifting appliances and anchor handling winches, as instructed by MSC 98;
- .2 the new requirements for onboard lifting appliances and anchor handling winches should avoid any additional unnecessary administrative burden;
- .3 a hazard identification should be the initial phase of the development of functional requirements with the caveat that it should not delay the finalization of the work on this output; and
- .4 although there were a number of certification regimes for compliance of loose gear with ISO standards, there was no accredited certification scheme in place.

10.8 In considering the actions requested in paragraph 68 of the report of the Correspondence Group (SSE 5/10), the Sub-Committee approved the report in general and took action as indicated below.

Scope of application

10.9 The Sub-Committee considered the deliberations with regard to the scope of application of the new requirements (SSE 5/10, annex 1, draft regulations 1.2 and 1.3), in particular, the three identified options: a "list of inclusions"; a "list of inclusions with some exclusions"; and a "list of exclusions", and noted the following views expressed on this issue:

- .1 a list of inclusions would clearly identify the equipment subject to the survey regime; however, the definitions for onboard lifting appliances would need to be revised to ensure that they were fit for purpose;
- .2 a list of inclusions with some exclusions would clearly define the scope of application of the new requirements; and
- .3 all appliances should be subject to the new requirements unless expressly provided in an exclusions list, which should be prepared taking into account whether the equipment was properly addressed by other instruments, the low risk of equipment or the absence of responsibility for the equipment by the ship or the company.

10.10 In considering how best to proceed, the Sub-Committee, recognizing the lack of agreement on this matter, invited MSC 100 to decide on how the scope of application of the

new requirements should be specified, taking into account the comments made at this session. Consequently, the Sub-Committee invited interested Member States and international organizations to submit proposals to MSC 100 in order to assist the Committee in making the decision.

References to the MODU Code

10.11 The Sub-Committee noted the legal advice provided by the Secretariat, which highlighted that referencing the MODU Code as an exclusion of application in the draft SOLAS regulations might be redundant and not appropriate.

Safe Working Load (SWL)

10.12 With regard to the SWL threshold value in the new SOLAS regulations, the Sub-Committee, having noted the following views expressed:

- .1 a 1,000 kg threshold was in line with the current certification practice of the industry and would prevent application to miscellaneous equipment such as "small chain blocks";
- .2 although SSE 4 had agreed that boundaries for the application of the new SOLAS regulation should be based on the SWL of the appliance, there should be no SWL threshold, taking into account that the risk to operators and crew members in case of failure of the equipment did not depend on said threshold; and
- .3 the application of the survey and certification regime for the appliances, as appropriate, should be established in accordance with a SWL threshold of 1,000 kg and the remaining functional requirements should apply to all appliances, irrespective of their SWL,

recognized that the decision on the SWL threshold to set the boundaries for the application of the new SOLAS regulation was linked to the discussion under paragraph 10.9 above. Consequently, the Sub-Committee decided to consider this matter at SSE 6, taking into account the decisions to be taken at MSC 100 relating to the scope of application.

Shore-based training and shore-side loose gear

10.13 The Sub-Committee agreed that the measures relating to the qualification and training for shore-based personnel required further consideration by a working group, taking into account the views expressed that the responsibility for ensuring adequate training of shore-based personnel rested with the shore-based company providing the personnel.

10.14 The Sub-Committee also agreed that loose gear brought from the shore-side should be excluded from the application of the new SOLAS regulation, taking into account that the Safety Management System should address the operational safety of said equipment if used by the crew; and decided to refer this matter to a working group for further consideration.

Placeholder for the draft new SOLAS regulations

10.15 Recalling the view expressed at MSC 98 that the determination of which SOLAS chapter should include the new OLAW provisions required further consideration, the Sub-Committee further considered this matter and noted the following views:

- .1 OLAW requirements could be suitably included in SOLAS chapter II-1, which already contained provisions such as regulations 3-8 and 3-9 for towing mooring equipment and means of embarkation on and disembarkation from ships, respectively, comparable to those for OLAW;
- .2 SOLAS chapter II-1 offered a robust and effective solution, which in turn might address the concerns expressed with regard to the introduction of additional unnecessary administrative burdens, as it represented a tool familiar to Administrations;
- .3 requirements for OLAW, as they were structural items, should be included in SOLAS chapter II-1 and be subject to the statutory survey regime of SOLAS chapter I;
- .4 if the new requirements for OLAW were to be placed in SOLAS chapter II-1, the survey and certification scheme of said equipment would be subject to SOLAS regulations I/7, I/10 and I/12, which might unnecessarily link failures of OLAW with port State control-related delays; therefore, a self-dedicated chapter in SOLAS with thorough examination provisions, as a stand-alone requirement, would separate the OLAW inspection regime from the one set out in SOLAS chapter I; and
- .5 the nature of OLAW required a different survey and certification regime from that of the ship's structure, machinery and equipment; therefore, the new requirements should be included either in SOLAS chapter XI-1 or in a new SOLAS chapter.

10.16 Following discussion and noting that there was no agreement in this regard, the Sub-Committee instructed the Working Group to further consider the above matter and advise the Sub-Committee accordingly.

Establishment of the working group

10.17 In light of the above, the Sub-Committee established the Working Group on Onboard Lifting Appliances and Anchor Handling Winches and instructed it, taking into account the comments made and decisions taken in plenary, to:

- .1 further develop draft goals and functional requirements taking into account the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1) and all documents submitted to this session under this output;
- .2 further consider which chapter of SOLAS should be the placeholder of the new onboard lifting appliances and anchor handling winches regulations and advise the Sub-Committee accordingly;
- .3 based on the draft goals and functional requirements developed under sub-paragraph .1 above, further develop draft SOLAS regulations for onboard lifting appliances and anchor handling winches, including the goals and functional requirements, the necessary definitions, the scope of application to new and existing ships, inspection and testing, training and qualification of personnel, taking into account annex 1 to document SSE 5/10 and documents SSE 5/10/1, SSE 5/10/2, SSE 5/10/3, SSE 5/10/4 and SSE 5/10/5;

- .4 further develop the draft guidelines for the safety of onboard lifting appliances and anchor handling winches, based on the draft set out in annex 2 to document SSE 5/10, taking into account the comments provided in documents SSE 5/10/2, SSE 5/10/3, SSE 5/10/4 and SSE 5/10/5; and
- .5 consider whether it is necessary to re-establish a correspondence group and, if so, prepare terms of reference for consideration by the Sub-Committee.

Report of the Working Group

10.18 Having considered the report of the Working Group (SSE 5/WP.5), the Sub-Committee approved the report in general and took actions as outlined in paragraphs 10.19 to 10.37 below.

Further development of the functional requirements and associated regulations

10.19 The Sub-Committee noted the progress made by the Group in further developing the functional requirements by considering all relevant hazards concerning OLAW, including those listed in the table in annex 1 to document SSE 5/10/1 and in accordance with the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1), as set out in annex 1 to document SSE 5/WP.5.

10.20 The Sub-Committee also noted that the work of the Group was based on a linkage table, which connected the draft functional requirements with their associated regulations (SSE 5/WP.5, annex 2).

10.21 In considering the Group's discussion on survey requirements for OLAW, the Sub-Committee noted the view of the Group that survey requirements were already addressed in SOLAS chapter I, including survey windows.

Training requirements for onboard lifting appliances and anchor handling winches

10.22 Given the number of accidents in relation to OLAW, some delegations expressed the following views, in response to the divergence of views of the Group (SSE 5/WP.5, paragraphs 18 to 24):

- .1 the original proposal for the output at MSC 89 (MSC 89/22/12), contained no reference to training and neither was there such reference in the report of the Correspondence Group to SSE 1;
- .2 if training was to be considered under this output, the HTW Sub-Committee should be listed as an associated organ in order to consider only training of shipboard personnel, as training for shore-based personnel was the responsibility of the port State following ILO's international training and certification regime;
- .3 the use of OLAW involved hazards that needed to be addressed through training to minimize the risks;
- .4 anyone who used OLAW on board should be trained, whether they be ship's crews or shore-based personnel; and

- .5 SOLAS may not be the instrument to address training matters but the Organization had already issued guidelines for training of shore-based personnel, such as in the *Guidelines on minimum training and education for mooring personnel* (FAL.6/Circ.11/Rev.1).

10.23 Following discussion, the Sub-Committee agreed to invite the Committee to note the views expressed on how to address training and certification of crews and shore-based personnel using OLAW.

Certification of loose gear

10.24 The Sub-Committee noted the Group's discussion on the certification of loose gear and that it had agreed to consider this matter further in a correspondence group, if established (see paragraph 10.37).

Out of service OLAW

10.25 In regard to the Group's discussion and conclusion in respect to circumstances where OLAW became "out of service" and whether such cases invalidated the Ship Safety Construction Certificate and would subsequently lead to the detention of a ship after a PSC inspection, the Sub-Committee considered the Group's conclusion that the current SOLAS provisions in regulations I/14, I/6(c) and I/11(a) sufficiently covered "out of service" condition of any equipment, including OLAW, and that this issue did not need to be further addressed in the draft regulation.

10.26 Subsequently, the Sub-Committee agreed, in principle, to the Group's conclusion that the term "out of service" in relation to onboard lifting appliances and anchor handling winches had been sufficiently addressed in SOLAS.

10.27 In response to the above decision taken by the Sub-Committee, the delegation of the Bahamas raised concerns in response to the Group's conclusion and subsequent endorsement, in principle, by the Sub-Committee, that SOLAS chapter I sufficiently addressed matters of "out of service", particularly as regulation I/6(c), as referenced by the Group, might require the ship to proceed to a repair yard, which might not always be necessary for "out of service" lifting appliances. It was also highlighted by the delegation that, if the OLAW regulations were to be included in SOLAS chapter II-1, there would be a need to reference existing regulation V/16.2 (Maintenance of equipment) in the draft regulation, as it addressed "out of service" and the conditions in which ships could continue to operate.

10.28 Following a request from the Group, the Sub-Committee also considered a proposal to develop guidance, as part of the Guidelines associated with the draft new regulation, for Recognized Organizations, Administrations, masters, companies and Port State Control Officers to identify when "out of service" OLAW posed a risk to the safety for the crew, the ship, its cargo or the marine environment so as to be able to decide if the ship was fit to proceed to sea.

10.29 After some discussion, the Sub-Committee endorsed, in principle, the inclusion of guidance on the specific criteria and conditions that might present a safety risk for "out of service" OLAW when further developing the draft Guidelines associated with the draft new regulation.

10.30 In connection with the above, the Sub-Committee noted the remarks of the observer from IACS that the matter of developing the aforementioned guidance, as proposed and

agreed to, in principle, by the Sub-Committee, together with the decision of which SOLAS chapter was to host the new regulations, were linked with, and had an impact on, the issue of "out of service" of lifting appliances and anchor handling winches.

10.31 The Sub-Committee also noted a statement by the delegation of the Bahamas that the proposed guidance on the specific criteria and conditions that might present a safety risk for "out of service" OLAW addressed primarily by port State control and, therefore, should be referred to the III Sub-Committee for inclusion in the *Procedures for port State control*.

10.32 In considering the above comments, the Sub-Committee clarified that the development of guidance would not preclude amending other IMO instruments, such as the *Procedures for port State control*.

Placeholder for the draft new SOLAS regulations

10.33 The Sub-Committee considered the Group's discussion on where the new SOLAS regulations for OLAW should be placed and, in particular, noted the diverging views either supporting the development of a new SOLAS chapter or to amend SOLAS chapter II-1, as originally agreed to by SSE 4.

10.34 Recalling its earlier discussion on this matter (see paragraph 10.15), the Sub-Committee decided to further consider this matter at a future session.

Guidelines for the safety of OLAW

10.35 In considering the development of the draft guidelines for the draft SOLAS text on onboard lifting appliances and anchor handling winches, the Sub-Committee noted that, owing to time constraints, the Group was unable to make further progress and included this task in the terms of reference of the Correspondence Group (see paragraph 10.37).

Experience gained with the application of the Generic guidelines for developing IMO goal-based standards (MSC.1/Circ.1394/Rev.1)

10.36 The Sub-Committee noted the Group's discussion on the experience gained with the application of the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1), in particular:

- .1 the difficulties encountered in the practical application of the Generic guidelines, in particular the level of detailed criteria required for functional requirements;
- .2 the lack of a clear methodology for drafting functional requirements, especially with respect to linking hazards to functional requirements, an issue the Organization also faced during the development of the Polar Code and the provisions for the safe carriage of industrial personnel;
- .3 the lack of discussion prior to agreeing to develop goal-based new regulations for OLAW on the appropriateness of the goal-based approach, i.e. in hindsight, the formulation of prescriptive OLAW regulations might have led to better results in a shorter period of time and, therefore, a thorough discussion on the type of regulation (goal-based or prescriptive) should be envisaged before drafting starts;

- .4 doubts over the added value of developing goal-based regulations for all cases, including for OLAW, as it might be appropriate to consider the need for further careful consideration of the general application of goal-based standards in the future; in particular, whether flexibility or the need for innovative risk control measures were vital to the successful implementation of a new or amended mandatory requirement; in these cases, the development time required to prepare robust and effective goal-based requirements in accordance with the Generic guidelines might be justified; and
- .5 while the goal-based regulations allowed for more flexibility in the design and use of technology and for a voluntary application outside the scope of mandatory application, they might not, by default, be the best solution for mandatory instruments,

and agreed to inform the Committee accordingly.

Re-establishment of the Correspondence Group

10.37 Having considered the above matters and in order to progress the work intersessionally, the Sub-Committee re-established the Correspondence Group on Onboard Lifting Appliances and Anchor Handling Winches, under the coordination of Japan,* and instructed it, taking into account the comments made and decisions taken at SSE 5, as well as documents SSE 5/17, SSE 5/10 (annex 2), SSE 5/10/1, SSE 5/10/2, SSE 5/10/3, SSE 5/10/4, SSE 5/10/5, SSE 5/WP.5 and MSC.1/Circ.1394/Rev.1, to:

- .1 further develop draft SOLAS regulations for onboard lifting appliances and anchor handling winches, excluding the scope of application in draft regulations 1.2 and 1.3, based on annex 1 to document SSE 5/WP.5, with a view to finalization at the next session of the Sub-Committee;
- .2 develop additional definitions for the draft SOLAS regulation, not related to the application in draft regulations 1.2 and 1.3, as appropriate;
- .3 further develop the draft guidelines for onboard lifting appliances and anchor handling winches, based on annex 2 to document SSE 5/10, with a view to finalization at SSE 6; and
- .4 submit a report to SSE 6.

*
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11 REVISED SOLAS REGULATIONS II-1/13 AND II-1/13-1 AND OTHER RELATED REGULATIONS FOR NEW SHIPS

General

11.1 The Sub-Committee recalled that SSE 4 had agreed that objective information and results of risk assessments were necessary in order to consider feasible safety solutions and to avoid any adverse effects on the primary safety functions of watertight doors (WTD), as well as the ship's watertight integrity and survivability.

11.2 It was also recalled by the Sub-Committee that SSE 4 had invited interested delegations and international organizations to provide objective information, results of risk assessments, if available, and possible safety solutions compatible with the functions of WTD for consideration by the Sub-Committee.

Anti-crushing warning signs for watertight doors

11.3 Having considered document SSE 5/11 (China), proposing the introduction of anti-crushing warning signs for WTD on board ships to reduce the risks of persons being crushed by WTD in daily or emergency situations, with no adverse effects on the primary safety functions of WTD or on the ship's watertight integrity and survivability, the Sub-Committee noted the following views expressed:

- .1 warning signs might unintentionally increase the frequency of crushing incidents and unsafe behaviours;
- .2 when a WTD was moving it was not safe to pass through; and
- .3 the proposal presented a solution that was workable and relatively easy to implement for a critical problem.

11.4 Having considered the above views, the Sub-Committee did not agree to the introduction of anti-crushing warning signs for WTD.

11.5 Taking into account that no progress had been made since the inclusion of this output in the 2016-2017 biennial agenda of the Committee by MSC 95 (MSC 95/22, paragraph 19.32), the Sub-Committee invited Member States and international organizations to submit proposals to the next session, with the understanding that the work on this output would be considered as completed with no action taken if no substantive proposals were submitted to SSE 6.

12 UNIFIED INTERPRETATION OF PROVISIONS OF IMO SAFETY, SECURITY AND ENVIRONMENT-RELATED CONVENTIONS

General

12.1 The Sub-Committee recalled that unified interpretations were a continuous item on the Sub-Committee's biennial agenda and that the Assembly, at its twenty-eighth session, had expanded the output to include all proposed unified interpretations to provisions of IMO safety, security and environment-related conventions so that any newly developed or updated draft unified interpretation could be submitted for the consideration of the Sub-Committee, with a view to developing a corresponding IMO interpretation, as appropriate.

Draft unified interpretation of SOLAS regulation II-2/9.2.4.2 relating to fire integrity of bulkheads and decks of tankers

12.2 The Sub-Committee recalled that MSC 98, in considering a draft MSC circular on Unified interpretations of SOLAS chapter II-2, in particular of SOLAS regulation II-2/9.2.4.2 (SSE 4/19, annex 9), had:

- .1 noted that SOLAS provided clear restrictions on which spaces could be located within the cargo area; and
- .2 agreed that the text corresponding to the draft unified interpretation of SOLAS regulation II-2/9.2.4.2 could contradict the provisions in the Convention.

12.3 In this context, the Sub-Committee noted that MSC 98 had approved the *Unified interpretations of SOLAS chapter II-2* (MSC.1/Circ.1581) and had instructed the Sub-Committee to further consider the above-mentioned draft unified interpretation in order to advise MSC 99 (MSC 98/23, paragraph 12.37).

12.4 In this connection, having noted:

- .1 that no documents on the above-mentioned matter had been submitted to this session; and
- .2 the information provided by the observer from IACS regarding the establishment of a project team to further consider this issue, taking into account the outcome of MSC 98, and that IACS would provide advice at a future session of the Sub-Committee accordingly,

the Sub-Committee agreed to consider this matter at a future session, if and when additional information was made available.

Unified interpretations on matters related to fire safety***Interpretation of the term "forward of" in paragraphs 2.2.3.2.1, 2.2.3.2.6 and 2.2.4.2.1 of chapter 15 of the FSS Code***

12.5 The Sub-Committee had for its consideration document SSE 5/12/2 (IACS), proposing to develop a unified interpretation clarifying the term "forward of" as used in chapter 15 (Inert gas systems) of the FSS Code and, as a long-term solution, to prepare draft amendments to the Code replacing the term "forward of" with the unambiguous wording "downstream of" and "upstream of", as appropriate.

12.6 In this context, having noted that there was general support for the understanding that the term "forward of" needed clarification, the Sub-Committee instructed the Working Group on Fire Protection, established under agenda item 7, to further consider the matter and advise the Sub-Committee accordingly (see paragraph 12.17).

Draft unified interpretation of SOLAS regulation II-1/47 relating to fire detection and alarms for boilers in periodically unattended machinery spaces

12.7 In considering document SSE 5/12/3 (IACS), proposing a draft unified interpretation of SOLAS regulation II-1/47 regarding the mandatory requirement to provide means to detect and give alarms in case of fires in boiler air supply casings and exhausts (uptakes), based on the inherent risk in the flue gas uptake and the air supply casing, the Sub-Committee noted the following views expressed:

- .1 the assessment and limits of inherent risk to determine the application of SOLAS regulation II-1/47 were unclear;
- .2 there was no certainty about how the tendency to accumulate soot on surfaces would be assessed by surveyors; and
- .3 the basis for the definitions proposed were unknown.

12.8 In light of the foregoing, the Sub-Committee did not endorse the proposed unified interpretation and invited IACS and interested delegations to note the comments made and take action, if deemed appropriate.

Draft unified interpretation of paragraph 11.4.8 of the IGC Code regarding the onboard discharge test of a dry chemical powder fire-extinguishing system

12.9 The Sub-Committee had the following documents for its consideration:

- .1 SSE 5/12/4 (IACS), providing a draft unified interpretation of paragraph 11.4.8 of the IGC Code intended to reduce the difficulties caused by the requirement to include, within the initial test of a dry chemical powder fire-extinguishing system, a discharge of sufficient amounts of dry chemical powder by confirming that the powder is discharged properly from the most onerously located monitor(s) and hose(s); and
- .2 SSE 5/12/10 (SIGTTO), providing comments on document SSE 5/12/4, in particular emphasizing that the installation function test required by paragraph 11.4.8 of the IGC Code is essential to fully test the system in order to ensure that it worked with the medium it was designed for, and that said test should not be downgraded.

12.10 In considering the above documents, the Sub-Committee noted the following views on the matter:

- .1 the actual performance of dry chemical powder fire-extinguishing systems depended on the piping geometry, which made it difficult to identify the most onerously located monitor(s) and hose(s);
- .2 the installation function test required by paragraph 11.4.8 of the IGC Code was intended to fully test the system in order to ensure that it worked with the medium it was designed for and said test might allow the detection of defects not identified during the ship's construction, which might lead to catastrophic consequences when the system was in service;
- .3 effective testing of the system should take precedence over practical difficulties to conduct the test required by paragraph 11.4.8 of the IGC Code; and
- .4 the term "sufficient amounts" in paragraph 11.4.8 of the IGC Code was unclear and it should not stand for a full function test with dry chemical powder unless said paragraph was properly amended.

12.11 In light of the foregoing, the Sub-Committee did not endorse the proposed unified interpretation and invited IACS, SIGTTO and other interested delegations to note the comments made and take action, if deemed appropriate.

Application of the design temperature for piping, fittings and related components (paragraph 11.3.6 of the IGC Code)

12.12 Taking into account that the requirements for fittings in water-spray systems for liquefied gas carriers set out in paragraph 11.3.6 of the IGC Code also applied to weather deck areas above cofferdams, ballast or void spaces at the after end of the aftermost hold space or at the forward end of the forwardmost hold space, although there was no provision related to weather deck areas above fuel oil tanks at the after end of the aftermost hold space or at the forward end of the forwardmost hold space, the Sub-Committee had for its consideration document SSE 5/12/8 (IACS), seeking its agreement that the weather deck area above these fuel oil tanks should be regarded as a "cargo area" for the purpose of the application of paragraph 11.3.6 of the IGC Code.

12.13 Having agreed that pipes, valves, nozzles and other fittings in water-spray systems on weather deck areas above fuel oil tanks at the after end of the aftermost hold space or at the forward end of the forwardmost hold space should be designed to withstand 925°C, the Sub-Committee invited IACS and other interested delegations to note the above agreement, with a view to submitting a draft unified interpretation to the next session.

Draft unified interpretation of SOLAS regulation II-2/13 regarding means of escape from control stations, accommodation and service spaces in case of flooding

12.14 The Sub-Committee considered the proposal in document SSE 5/12/9 (CLIA), which provided a draft unified interpretation of SOLAS regulation II-2/13.1.5, proposing that doors in vertical emergency escape trunks that might open out of the trunk in order to permit the trunk to be used both for escape and for access should not be fitted below the bulkhead deck due to the force necessary to open the door in case of flooding. In this regard, the Sub-Committee noted that the above proposal had also been considered at SDC 5 (SDC 5/9/1) and the SDC Sub-Committee was of the view that SOLAS regulation II-2/13.3 applied to control stations, accommodation and service spaces, but not to machinery spaces and, therefore, had agreed that the proposal should be considered as an amendment to regulation II-2/13.3.1.5.2, rather than as an interpretation (SDC 5/15, paragraphs 9.3 to 9.5).

12.15 In the ensuing discussion, the Sub-Committee noted the following views:

- .1 doors in vertical emergency escape trunks below the bulkhead deck that opened inward of the trunk, as proposed by CLIA, increased the space required in the trunk, which might be a drawback in small passenger ships;
- .2 although the intent of the proposal might be acceptable, it should be addressed by means of an amendment to SOLAS in line with the decision by SDC 5; and
- .3 based on the understanding that a vertical trunk in machinery spaces constituted a secondary means of escape in cases of fire and that it was not intended for cases of flooding, where inclined ladders should be used instead, an amendment to SOLAS in order to require that doors in vertical emergency escape trunks below the bulkhead deck opened inward of the trunk could not be supported.

12.16 Having considered the above views, the Sub-Committee did not endorse the proposed unified interpretation and invited CLIA and other interested delegations to note the comments made and take action, if deemed appropriate.

Instructions to the FP Working Group

12.17 Following consideration of the term "forward of" in the context of the FSS Code (see paragraph 12.6), the Sub-Committee instructed the Working Group on Fire Protection, established under agenda item 7 (see paragraph 7.12), to consider document SSE 5/12/2 and advise the Sub-Committee accordingly.

Report of the FP Working Group

12.18 Having considered the part of the report of the FP Working Group (SSE 5/WP.4) dealing with this agenda item, the Sub-Committee took action as outlined in paragraphs 12.19 and 12.21 below.

12.19 The Sub-Committee noted the Group's advice that the words "forward of", which were used in paragraphs 2.2.3.2.1, 2.2.3.2.6 and 2.2.4.2.1 of chapter 15 of the FSS Code, should be replaced by the words "downstream of".

12.20 Following the advice from the group, the Sub-Committee agreed to draft amendments to paragraphs 2.2.3.2.1, 2.2.3.2.6 and 2.2.4.2.1 of chapter 15 of the FSS Code, as set out in annex 3, as "minor corrections" in accordance with paragraph 3.2(vi) of document C/ES.27/D, for submission to MSC 100 for approval and subsequent adoption.

12.21 Notwithstanding the above decision, the Sub-Committee also agreed, as an interim solution prior to the entry into force of the aforementioned amendments, to amendments to the *Unified interpretations of chapter 15 of the FSS Code* (MSC.1/Circ.1582), as set out in annex 4, for submission to MSC 100 for approval.

Unified interpretations on matters related to life-saving appliances and arrangements

Draft unified interpretation relating to SOLAS regulation III/20.11

12.22 The Sub-Committee had for its consideration document SSE 5/12 (IACS), providing a draft unified interpretation regarding maintenance, thorough examination, operational testing, overhaul and repair of lifeboats, rescue and fast rescue boats, launching appliances and releasing gear, subsequent to the amendments to SOLAS regulation III/20.11, adopted by resolution MSC.404(96), based on the latest version of IACS unified interpretation SC144, which was intended to clarify that examinations, overhauls and operational tests carried out at intervals of at least once every five years should be done in the presence of the surveyor in order to verify that the relevant equipment had been maintained and tested satisfactorily.

12.23 In considering the above document, the Sub-Committee noted the following views expressed during the discussion:

- .1 a unified interpretation in this regard should unambiguously use the term "surveyor", taking into account that, in the context of SOLAS, it should only stand for officers of the Administration, surveyors nominated by the Administration or surveyors of organizations recognized by the Administration; and
- .2 bearing in mind that the thorough examination, operational testing and overhaul should be carried out in accordance with the *Requirements for maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear* (resolution MSC.402(96)), which in turn provided that the above activities

should be carried out by service providers authorized by Administrations, it might be inferred that said activities might not be included within the items required in the survey requirements of SOLAS chapter I.

12.24 Having noted the relevance of the concerns reflected in paragraph 12.23.2 above, the Sub-Committee did not endorse the proposed unified interpretation and invited:

- .1 III 5 to consider said concern and advise SSE 6 accordingly; and
- .2 IACS and other interested delegations to note the comments made and take action, if deemed appropriate.

Draft unified interpretation of paragraph 4.4.8.1 of the LSA Code on lifeboat equipment

12.25 The Sub-Committee considered document SSE 5/12/1 (Austria et al.), providing a draft unified interpretation of paragraph 4.4.8.1 of the LSA Code and section 4.4.1.2 of the *Standardized life-saving appliance evaluation and test report forms* (MSC/Circ.980/Add.1), intended to exempt lifeboats equipped with two independent propulsion systems from being equipped with sufficient buoyant oars, and their related items, to make headway in calm seas.

12.26 Following discussion, the Sub-Committee agreed to the draft Unified interpretation of paragraph 4.4.8.1 of the LSA Code and the associated draft MSC circular, as set out in annex 5, for submission to MSC 100 for approval.

Understanding of paragraph 6.1.2.2 of the LSA Code regarding the remote actuation of a launching mechanism

12.27 In considering document SSE 5/12/5 (ILAMA), proposing the development of a unified interpretation of paragraph 6.1.2.2 of the LSA Code in order not to limit the remote actuation of a launching mechanism of survival craft or rescue boats to the manual actuation only, taking into account the low reliability of conventional wire-operated remote control systems, the Sub-Committee noted the following views:

- .1 the low reliability of existing systems might be attributed to mishandling or lack of maintenance;
- .2 the effectiveness of recent amendments to SOLAS regulation III/20 and its associated requirements adopted by resolution MSC.402(96) should be assessed before introducing potentially complex systems; and
- .3 taking into account that paragraph 6.1.1.3 of the LSA Code did not require a particular type of actuation mechanism to launch the survival craft or rescue boat, any innovative system might be addressed as an alternative design and arrangement.

12.28 Following discussion, the Sub-Committee did not agree with the understanding contained in the aforementioned document and invited ILAMA and other interested delegations to note the comments made and take action, if deemed appropriate.

Draft unified interpretation of the required safety and test load factors for LSA equipment

12.29 The Sub-Committee considered document SSE 5/12/6 (ILAMA), providing interpretations on safety and test load factors of items of LSA equipment for which the

requirements in IMO instruments were either not clear or not referenced and, therefore, open to interpretation.

12.30 In the ensuing discussion, the Sub-Committee noted the following views:

- .1 unclear additional tests and approval requirements for some items were introduced;
- .2 unnecessary sub-division of component requirements for some appliances were proposed; and
- .3 there was no description of test load factors for some of the items.

12.31 Consequently, the Sub-Committee did not endorse the proposed unified interpretation and invited ILAMA and other interested delegations to note the comments made and take action, if deemed appropriate.

Draft unified interpretation of SOLAS regulation III/20.4 relating to the scope of types of falls used in launching

12.32 The Sub-Committee had for its consideration document SSE 5/12/7 (ILAMA), providing a draft unified interpretation of the term "falls used in launching" and their inspection requirements in the context of SOLAS regulation III/20.4 with a view to broadening the meaning of said term and, consequentially, the scope of application of the above-mentioned regulation.

12.33 Having noted that SOLAS regulation III/20.4 expressly referred to falls used in launching, which should be understood as hoisting wires of a lifting appliance, the Sub-Committee:

- .1 did not endorse the proposed unified interpretation;
- .2 agreed that an expansion of the scope of this regulation, as contained in the proposal, should be properly justified and could only be addressed by means of an amendment to the SOLAS Convention; and
- .3 invited ILAMA and other interested delegations to note the comments made and take action, if deemed appropriate.

Arrangements for steering capability and function on ships fitted with propulsion and steering systems other than traditional arrangements for a ship's directional control

12.34 The Sub-Committee recalled that IACS had submitted document SSE 4/12/10 (IACS) to SSE 4, which contained a copy of revision 1 of IACS UI SC242 regarding the arrangements for steering capability and function on ships fitted with propulsion and steering systems other than traditional arrangements for a ship's directional control. In this context, the Sub-Committee also recalled that SSE 4 had agreed not to proceed with the development of an IMO unified interpretation based on the revised IACS unified interpretation, but to retain the existing unified interpretation, as contained in the *Arrangements for steering capability and function on ships fitted with propulsion and steering systems other than traditional arrangements for a ship's directional control* (MSC.1/Circ.1416). In this regard, the Sub-Committee noted the verbal information provided by the observer of IACS that, after it had carefully reviewed the outcome of SSE 4 on this issue, revision 1 of IACS UI SC242 had been deleted in December 2017.

13 DEVELOPMENT OF GUIDELINES FOR COLD IRONING OF SHIPS AND OF AMENDMENTS TO SOLAS CHAPTERS II-1 AND II-2, IF NECESSARY

General

13.1 The Sub-Committee recalled that MSC 98, following consideration of document MSC 98/20/7 (China) proposing to develop mandatory and non-mandatory safety provisions for cold ironing of ships and guidance on safe operation of on-shore power supply service in port, had agreed to include a new output in the 2018-2019 biennial agenda of the Sub-Committee and the provisional agenda for SSE 5 on "Development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, if necessary", with a target completion year of 2020, in association with the SDC and III Sub-Committees, as and when requested by the Sub-Committee (MSC 98/23, paragraph 20.36).

Draft guidelines on safe operation of on-shore power supply

13.2 The Sub-Committee considered the following documents:

- .1 SSE 5/13 (China), proposing draft Guidelines on safe operation of on-shore power supply (OPS) service in port for ships engaged on international voyages, taking into account the technical standards of the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC) and the Institute of Electrical and Electronics Engineers (IEEE) Standards Association. In particular, the proposed guidelines provide provisions for a compatibility assessment before the connection, installation, operation and personnel;
- .2 SSE 5/13/1 (China), providing a brief introduction of the framework and main contents of the draft guidelines on safe operation of OPS service in port for ships engaged on international voyages, as set out in document SSE 5/13. In particular, the document is intended to clarify and highlight some of the key points of the draft Guidelines, such as their scope of application; the first connection of the ship to the OPS; communication arrangements; the oversight of the compatibility assessment and the initial tests for the ship; and personnel qualification; and
- .3 SSE 5/13/2 (United States), providing proposals and comments on the draft guidelines on safe operation of OPS service in port for ships engaged on international voyages, as set out in document SSE 5/13, including that:
 - .1 the draft Guidelines, which referred to relevant standards of the ISO, the IEC and the IEEE Standards Association, should not duplicate or be in conflict with the information addressed by the standards; and
 - .2 the HTW Sub-Committee should be invited to review section 5 (Personnel) of the draft Guidelines (SSE 5/13, annex) in order to verify its alignment with standard IEC/ISO/IEEE 80005-1 and the need for additional competencies.

13.3 In considering the above documents, the Sub-Committee noted the following views:

- .1 the draft Guidelines needed further development; they should not contain overly prescriptive provisions, including what qualifications should be held by

- personnel; and they should also not set out certification requirements in accordance with the STCW Convention;
- .2 any sections of the draft Guidelines addressing qualification of personnel involved in OPS operations should be revised by the HTW Sub-Committee;
 - .3 the draft Guidelines should address safety and environmental matters;
 - .4 duplication or conflict between the draft Guidelines and recognized international standards should be avoided;
 - .5 as some of the international standards relevant to the draft Guidelines were currently under review, the Sub-Committee should use the latest adopted versions of any standards;
 - .6 the draft Guidelines should also deal with specific challenges concerning tankers; and
 - .7 as OPS operations entail ship-port interface, the allocation of responsibilities for testing and maintenance to crew and shore-side personnel should be considered.

13.4 Subsequently, the Sub-Committee agreed that, taking into account the comments made at this session, a correspondence group could further develop the draft Guidelines on safe operation of OPS service in port for ships engaged on international voyages (SSE 5/13, annex).

Establishment of a drafting group

13.5 In light of the foregoing, the Sub-Committee established a Drafting Group on Safe Operation of On-Shore Power Supply (OPS) and instructed it, taking into account the comments made and decisions taken in plenary, to prepare draft terms of reference for a correspondence group, for consideration by the Sub-Committee.

Report of the Drafting Group

13.6 Having approved the report of the Drafting Group (SSE 5/WP.7), in general, the Sub-Committee noted the views of the Group that the draft Guidelines should be developed by focusing, as a first step, on the operational safety aspects, with the expectation that the further development would incorporate a uniform set of equipment standards by the target completion year.

13.7 In this connection, the Sub-Committee noted a statement by the observer from CLIA, supported by the observer from ICS, that they had welcomed and supported the development of new IMO guidance for OPS service in ports, as having an internationally recognized voluntary uniform equipment standard could help to reduce the number and variability of different types of electrical arrangements globally; thus increasing potential compatibility between international shipping in the ports in which they call, arguably to be successful in moving the needle on GHG emissions through, for example, the use of ship-shore power arrangements, particularly under a voluntary consensus-based standard. As a matter of first principle, it should be recognized that the future availability would take a certain level of voluntary commitment by all parties involved, so as to be able to consider whether both sides were compatible.

Establishment of a correspondence group

13.8 Having considered the above matters and the recommendations of the drafting group, the Sub-Committee established a Correspondence Group on Development of Guidelines on Safe Operation of On-shore Power Supply Service in Port for Ships Engaged on International Voyages, under the coordination of China,* and instructed it, taking into account the comments made and decisions taken at SSE 5, to:

- .1 further develop and revise the draft Guidelines on safe operation of on-shore power supply service in port for ships engaged on international voyages, based on document SSE 5/13, taking into account documents SSE 5/13/1 and SSE 5/13/2;
- .2 consider, when developing the above draft Guidelines:
 - .1 the structure and framework of the draft Guidelines; and
 - .2 the current conventions, codes, guidelines and international standards to be referred to in the draft guidelines, including any deviations from such instruments, taking into account that some of the international standards were under revision;
- .3 investigate the necessity of amendments to SOLAS chapters II-1 and II-2, and, if deemed necessary, prepare the draft amendments together with an associated draft MSC resolution; and
- .4 submit a report to SSE 6.

14 BIENNIAL STATUS REPORT AND PROVISIONAL AGENDA FOR SSE 6

General

14.1 The Sub-Committee noted that MSC 98 had agreed to include, in the 2018-2019 biennial agenda of the Sub-Committee and the provisional agenda for SSE 5, the following two new outputs on:

- .1 "Development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, if necessary," with a target completion year of 2020; and
- .2 "Amendments to MSC.1/Circ.1315," with a target completion year of 2019.

14.2 It was also noted by the Sub-Committee that A 30 had adopted the *Strategic Plan for the Organization for the six-year period 2018-2023* (resolution A.1110(30)) and the *Application of the Strategic Plan for the Organization* (resolution A.1111(30)), and had requested:

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- .1 all IMO organs to ensure full observance of resolution A.1111(30), which provided a uniform basis for the application of the Strategic Plan throughout the Organization, and for the strengthening of existing working practices through the provision of enhanced planning and management procedures that were simple, manageable, proportional, transparent and balanced; and
- .2 the Council and the committees to review and revise, during the 2018-2019 biennium, the documents on the organization and method of their work, taking into account resolution A.1111(30), as appropriate.

Biennial status report for the 2018-2019 biennium

14.3 Taking into account the progress made at the session, the Sub-Committee prepared the biennial status report and the outputs of the Committee's post-biennial agenda that fell under the purview of the Sub-Committee (SSE 5/WP.2, annex 1), as set out in annex 6, for consideration by MSC 99.

14.4 In this context, the Sub-Committee agreed to modify the title of output 2.8 in order to specify it in SMART terms, as follows: "Development of guidelines for cold ironing of ships and consideration of amendments to SOLAS chapters II-1 and II-2".

Proposed provisional agenda for SSE 6

14.5 Taking into account the progress made at the session, the Sub-Committee prepared the proposed provisional agenda for SSE 6 (SSE 5/WP.2, annex 2), as set out in annex 7, for consideration by MSC 99.

Correspondence groups established at the session

14.6 The Sub-Committee established correspondence groups on the following subjects, due to report to SSE 6:

- .1 life-saving appliances (see paragraph 3.11);
- .2 fire protection (see paragraph 7.12);
- .3 onboard lifting appliances and anchor handling winches (see paragraph 10.37); and
- .4 cold ironing of ships (see paragraph 13.8).

IMO web-based working platform for correspondence groups

14.7 The Sub-Committee noted that C 118 had requested the Secretary-General (C 118/D, paragraph 7.3) to, inter alia, evaluate the accessibility to a collaborative web-based working platform for correspondence groups (IMOSpace) and to report the outcome to C 120.

14.8 Following on from this request, the Secretariat informed the Sub-Committee that it had established IMOSpace, on a trial basis, and invited correspondence group coordinators to use the new functionality for facilitating and improving the intersessional work and the subsequent reporting of the outcome of this work.

14.9 In order to use the new functionality, correspondence group coordinators, or those delegations that wished to use IMOSpace for coordinating any multilateral intersessional work

on a particular agenda item of the SSE Sub-Committee, could request administrator rights by sending an e-mail to sse@imo.org. Those delegations that wished to participate, and not to coordinate the intersessional work, would need to ensure to have a valid IMO web account before sending their request to join the discussion to the coordinator of the intersessional correspondence group by email. Once the coordinator of the correspondence group had activated the user account for the group, the participant would be able to join the discussion on IMOSpace.

Arrangements for the next session

14.10 The Sub-Committee agreed to establish, at its next session, working and drafting groups on the following subjects:

- .1 life-saving appliances (agenda items 3, 4 and 5);*
- .2 fire protection (agenda items 6, 7 and 8);
- .3 onboard lifting appliances and anchor handling winches (agenda item 9); and
- .4 cold ironing of ships (agenda item 11),

whereby the Chair, taking into account the submissions received on the respective subjects, would advise the Sub-Committee before SSE 6 on the final selection of such groups.

Urgent matters to be considered by MSC 99

14.11 Having noted the close proximity between SSE 5 and MSC 99, the Sub-Committee invited MSC 99 to consider the following urgent matters emanating from SSE 5, in accordance with the Committees' *Organization and Method of Work* (MSC-MEPC.1/Circ.5):

- .1 the development of goals and functional requirements for onboard lifting appliances and winches (see paragraphs 10.13 to 10.15); and
- .2 the outcome of the consideration of the draft unified interpretation of SOLAS regulation II-2/9.2.4.2 (see paragraph 12.4),

with the report of this meeting being considered by MSC 100.

Date of the next session

14.12 The Sub-Committee noted that the sixth session of the Sub-Committee had been tentatively scheduled to take place from 4 to 8 March 2019.

15 ELECTION OF CHAIR AND VICE-CHAIR FOR 2019

15.1 In accordance with the revised Rules of Procedure of the Maritime Safety Committee, the Sub-Committee unanimously re-elected Dr. S. Ota (Japan) as Chair and Mr. U. Senturk (Turkey) as Vice-Chair, both for 2019.

* Agenda item numbers refer to annex 7.

16 ANY OTHER BUSINESS

Consistency of in-water survey (IWS) provisions for passenger and cargo ships

16.1 The Sub-Committee noted that III 4, recognizing that doubts existed in relation to the consistency of the measurement of rudder bearing clearances provisions during in-water survey (IWS) for passenger and cargo ships, had agreed to seek technical input from the SDC and SSE Sub-Committees, as appropriate, prior to considering the issues raised in documents MSC 98/17/1 and III 4/8/3 (IACS) at III 5.

16.2 In this connection, the Sub-Committee noted that SDC 5, having considered the above-mentioned matter, had endorsed the Secretariat's view that the problem highlighted in documents MSC 98/17/1 and III 4/8/3 was only related to "rudder bearing clearances" and, therefore, should be addressed by the SSE Sub-Committee (SDC 5/15, paragraph 14.6).

16.3 Subsequently, the Sub-Committee noted the statement by the observer from ICS that it remained concerned that proposals aimed at addressing apparent discrepancies between requirements for IWS of passenger (excluding ro-pax) and cargo ships would remove the need to effectively monitor the actual condition of rudder bearings at least twice in a five-year period. No analysis had been submitted which was able to substantiate proposals to predict rudder bearing clearances based on operating history and onboard testing. Although cases of rudder bearing clearances exceeding allowable maximum values were infrequent, they did, however, still occur and might be identified by the in-water measurements which had been taken at two-and-a-half year intervals. Since there had been no analysis available to support the effectiveness of monitoring the condition of rudder bearings using operating history and onboard testing, the observer from ICS considered that the Sub-Committee should recommend that no further action be taken on this item and that the current requirements for in-water measurement be retained.

16.4 The Sub-Committee also noted that the delegation of France did not support the proposals in documents MSC 98/17/1 and III 4/8/3 (IACS) as rudder bearing clearances were important to monitor, as it provided for the detection, at an early stage, of abnormal wear and tear and thus helped avert accidents in a critical area, similar to that of the loss of the **Amoco Cadiz** 40 years ago. In this context, the delegation stated that it did not agree with the argument that, if the IWS was not completely reliable a predictive approach should be taken instead, as an abnormal wear test following a predictive approach could not, by its very nature, predict wear and tear which was not normal. To accept any such approach, there would have to be a 100% guarantee, but the data provided showed that, with the current frequency, the rudder bearing clearance measurements exceeding the limits represented 1% of the measurements and that figure alone justified the current frequencies. As far as the reliability of the IWS test was concerned: if that was insufficient, then ways needed to be found to improve on it and, indeed, there were classification societies that were proposing additional class notation for this type of IWS. Hence the solution was to improve on the IWS rudder bearing measurements, rather than abandon them, and IWS were only an alternative to the dry dock, which remained the favoured method.

16.5 Having noted the information provided by the observer from IACS that the *Survey guidelines under the harmonized system of survey and certification (HSSC), 2017* (resolution A.1120(30)) and the *Guidelines for the assessment of technical provisions for the performance of an in-water survey in lieu of bottom inspection in dry-dock to permit one dry-dock examination in any five-year period for passenger ships other than ro-ro passenger ships* (MSC.1/Circ.1348) contained misaligned provisions for the measurement of rudder bearing clearances not only between cargo and passenger ships, but also for passenger ships

themselves, the Sub-Committee decided not to take action in this regard and did not agree with the proposal in document III 4/8/3.

16.6 Consequently, the Sub-Committee requested the Secretariat to inform III 5 of the outcome related to the measurement of rudder bearing clearances for passenger and cargo ships.

Amendments to the Revised recommendation on testing of life-saving appliances (resolution MSC.81(70)), as amended

16.7 The Sub-Committee noted that the *Revised recommendation on testing of life-saving appliances* (resolution MSC.81(70)), as amended, referred to standard ISO 12402-7, "Personal flotation devices - Part 7: Materials and components - Safety requirements and test methods," and that the edition date (i.e. 2006) of the above ISO standard was not provided in some instances within the above MSC resolution. In this regard, the Sub-Committee considered document SSE 5/16 (Japan), proposing corrections to the Revised recommendation in order to include the above-mentioned standard's edition date in all its references in accordance with the *Guidelines on methods for making reference to IMO and other instruments in IMO conventions and other mandatory instruments* (MSC/Circ.930-MEPC/Circ.364), based on the understanding that such amendments might be considered a "minor correction", as referred to in paragraph 3.2(vi) of document C/ES.27/D.

16.8 Following consideration of document SSE 5/16 and having noted that the intent of the proposal was not to refer to the latest version of the standard without a detailed analysis, the Sub-Committee requested the Secretariat to prepare the corresponding corrigendum to resolution MSC.200(80) based on the annex to document SSE 5/16.

Requirements for spaces containing emergency fire pumps

16.9 The Sub-Committee considered document SSE 5/16/1 (China), providing the experience gained on Chinese ships engaged on international trade equipped with a water ingress alarm in the space containing the emergency fire pump and informing about China's intention to submit a relevant document to the Committee to propose a new output on the review of the requirements of SOLAS chapter II-2 to fit water ingress alarms in unmanned spaces below the waterline containing the emergency fire pump.

16.10 Having noted the following views:

- .1 water ingress alarms might be helpful to the early detection of water ingress in the emergency fire pump space, but they did not contribute to mitigating the potential damage caused by the ingress of water; and
- .2 proper implementation of SOLAS provisions should prevent the ingress of water in the emergency fire pump space,

the Sub-Committee noted the information contained in document SSE 5/16/1.

16.11 In this context, the Sub-Committee invited the Committee to note the concerns expressed regarding the proliferation of substantive documents being considered under the agenda item on "Any other business" before such documents had been properly addressed by the Committee in accordance with the relevant procedures for new outputs.

Possible omissions in SOLAS regulation II-2/9.7, as amended by resolution MSC.365(93)

16.12 The Sub-Committee had for its consideration document SSE 5/16/2 (China), discussing possible omissions in SOLAS regulation II-2/9.7.2.4 regarding paragraph numbering, regulation II-2/9.7.3.1.3 regarding the arrangement requirements of ventilation ducts with a free cross-sectional area exceeding 0.075 m² that pass through "A" class divisions and regulation II-2/9.4.1.1.9 regarding a duplication of a requirement; and proposing a possible corrigendum.

16.13 During the consideration of the document, the Sub-Committee noted the following views:

- .1 the modification proposed in paragraph 7.1 of the document regarding the renumbering of paragraphs had already been included in the certified copy of the corresponding amendment adopted by resolution MSC.365(93) and therefore no further action was necessary;
- .2 the proposed amendment to SOLAS regulation II-2/9.7.3.1.3, which required that ducts with a free cross-sectional area exceeding 0.075 m² passing through "A" class divisions be lined with sleeves, might not be necessary as said ducts must be constructed of steel having a thickness of at least 4 mm in accordance with SOLAS regulation II-2/9.7.2.4; and
- .3 the proposal to delete the supposedly duplicated SOLAS regulation II-2/9.4.1.1.9 should not be accepted because its scope of application was different from that of SOLAS regulation II-2/9.7.2.6.

16.14 Consequently, the Sub-Committee agreed that, in order to address the issues raised in the aforementioned document, a proposal for a new output in accordance with the *Committees' Organization and method of work* (MSC-MEPC.1/Circ.5) would be necessary.

Proposal for the review of the requirements for the gravity type rescue boats recovery strops of SOLAS chapter III and chapter VI of the LSA Code

16.15 The Sub-Committee considered document SSE 5/16/3 (China), raising a possible inconsistency between the 2006 amendments to chapter VI of the LSA Code and the 1996 amendments to SOLAS regulation III/17.5, concerning the provision of recovery strops for rescue boat launching appliances based on whether heavy fall blocks constitute a danger; and informing about China's intention to submit a relevant document to the Committee to propose a new output for the review of the corresponding requirements of SOLAS chapter III and chapter VI of the LSA Code.

16.16 Having agreed that, in both of the above requirements, the provision for foul weather recovery strops was conditional on the fact that heavy fall blocks constituted a danger, the Sub-Committee confirmed that there had been no inconsistency.

16.17 Subsequently, the Sub-Committee invited the delegation of China and other interested delegations to note that, if the intent of the above document was to expand the requirement for the provision of recovery strops for rescue boat launching appliances, it should be addressed by means of a new output proposed in accordance with the *Committees' Organization and method of work* (MSC-MEPC.1/Circ.5).

Use of linked ship/shore emergency shutdown systems for oil and chemical transfers

16.18 The Sub-Committee noted the information contained in document SSE 5/INF.2 (OCIMF), providing guidance on the use of "Linked Ship/Shore Emergency Shutdown Systems for Oil and Chemical Transfers", intended to establish the safety benefits of using standardized connections that would enable the ship and the terminal emergency shutdown (ESD) systems to be linked as an effective barrier to prevent cargo leakage, fire and explosions, regardless of the ship size. In particular, that the Secretariat would be requested in the future to include the information set out in the annex to the revised FAL.6/Circ.14, containing the list of existing publications relevant to areas and topics relating to the ship/port interface.

Proposal to review the Code of Safety for Diving Systems and resolution A.692(17)

16.19 The Sub-Committee noted the information provided in document SSE 5/INF.9 (Marshall Islands et al.), expressing the need to review the Code of Safety for Diving Systems and the *Guidelines and specifications for hyperbaric evacuation systems* (resolution A.692(17)) and informing of the co-sponsors' intention to submit a proposal for a new output to MSC 99.

GISIS module to replace SSE.1 circulars on test laboratories and halon banking

16.20 The Sub-Committee recalled that SSE 4 had been informed that a new GISIS module was under development to replace the SSE.1 circulars on *Halon banking and reception facilities* (SSE.1/Circ.2/Rev.1) and *List of recognized test laboratories* (SSE.1/Circ.3/Rev.1). In this connection, the Sub-Committee noted that the Secretariat would continue the current practice of updating and releasing revised circulars, as and when necessary, until the above-mentioned GISIS module was fully operative.

Expressions of appreciation

16.21 The Sub-Committee expressed appreciation to the following delegates and members of the Secretariat who had recently relinquished their duties, retired or been transferred to other duties, or were about to do so, for their invaluable contribution to its work and wished them a long and happy retirement or, as the case might be, every success in their new duties:

- Mr. John De Rose (RINA) (on retirement)
- Mr. Joseph Angelo (INTERTANKO) (on retirement)
- Mr. Miguel Núñez (Spain) (on transfer)
- Mr. Ashok Mahapatra (IMO) (on retirement)
- Mr. Youqiang Li (IMO) (on retirement)

17 ACTION REQUESTED OF THE COMMITTEE

17.1 The Maritime Safety Committee, at its ninety-ninth session, is invited to:

- .1 note the progress made on the development of goals and functional requirements for OLAW and, in particular, the views expressed on how to address training and certification of crews and shore-based personnel using OLAW (paragraphs 10.13 and 10.31);
- .2 note the decision to consider matters related to the development of a draft unified interpretation of SOLAS regulation II-2/9.2.4.2 at a future session when additional information is made available (paragraphs 12.2 to 12.4);

- .3 approve the biennial status report of the Sub-Committee (paragraph 14.3 and annex 6); and
 - .4 approve the proposed provisional agenda for SSE 6 (paragraph 14.5 and annex 7).
- 17.2 The Maritime Safety Committee, at its one-hundredth session, is invited to:
- .1 note the outcome on matters related to the safety objectives and functional requirements for the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III (paragraphs 3.9 to 3.11);
 - .2 approve the draft amendments to paragraph 6.1.1.3 of the LSA Code with a view to adoption at MSC 101, taking into account the check/monitoring sheet and records for regulatory development prepared by the Secretariat (paragraph 5.7 and annex 1);
 - .3 note the progress made with regard to the consequential work related to the Polar Code (paragraphs 6.11 to 6.18);
 - .4 approve the draft amendments to MSC.1/Circ.1430 on *Revised guidelines for the design and approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces*, with a view to issuing the amended Revised guidelines as MSC.1/Circ.1430/Rev.1 (paragraph 7.17 and annex 2);
 - .5 consider how the scope of application of the new requirements for onboard lifting appliances and anchor handling winches should be specified, taking into account the three identified options proposed by the Sub-Committee, and take action as appropriate (paragraphs 10.9 and 10.10);
 - .6 note the views expressed on the training and certification of crews and shore-based personnel using onboard lifting appliances and anchor handling winches (paragraph 10.23);
 - .7 forward the views expressed on the experience gained in the application of the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1) to the GBS Working Group (paragraph 10.36);
 - .8 approve the draft amendments to paragraphs 2.2 of chapter 15 of the FSS Code, with a view to subsequent adoption (paragraphs 12.19 and 12.20 and annex 3);
 - .9 approve, as an interim solution prior to the entry into force of the above amendments to chapter 15 of the FSS Code, the draft amendments to MSC.1/Circ.1582 on *Unified interpretations of chapter 15 of the FSS Code*, with a view to issue the amended Unified interpretation as MSC.1/Circ.1582/Rev.1 (paragraph 12.21 and annex 4);
 - .10 instruct III 5 to consider the concerns expressed on the survey requirements of SOLAS chapter I with regard to surveys carried out in accordance with resolution MSC.402(96) (paragraphs 12.22 to 12.24);

- .11 approve the draft MSC circular on Unified interpretation of paragraph 4.4.8.1 of the LSA Code (paragraph 12.26 and annex 5);
- .12 note the concerns expressed regarding the proliferation of substantive documents being considered under the agenda item on "Any other business" before such documents have been properly addressed by the Committee in accordance with the relevant procedures for new outputs (paragraph 16.11); and
- .13 approve the report in general.

ANNEX 1

DRAFT AMENDMENTS TO PARAGRAPH 6.1.1.3 OF THE LSA CODE

CHAPTER VI*
LAUNCHING AND EMBARKATION APPLIANCES

Paragraph 6.1.1.3 is amended as follows:

"6.1.1.3 A launching appliance shall not depend on any means other than gravity or stored mechanical power which is independent of the ship's power supplies to launch the survival craft or rescue boat it serves in the fully loaded and equipped condition and also in the light condition.

On cargo ships equipped with a rescue boat which is not one of the ship's survival craft, having a mass not more than 700 kg in fully equipped condition, with engine, but without the crew, the launching appliance of the boat does not need to be fitted with stored mechanical power. Manual hoisting from the stowed position and turning out to the embarkation position shall be possible by one person. The force on the crank handle shall not exceed 160 N at the maximum crank radius of 350 mm. Means shall be provided for bringing the rescue boat against the ship's side and holding it alongside so that persons can be safely embarked."

* Shaded text denotes new text.

APPENDIX 1¹

**CHECK/MONITORING SHEET FOR THE PROCESSING OF AMENDMENTS TO
THE CONVENTION AND RELATED MANDATORY INSTRUMENTS
(PROPOSAL/DEVELOPMENT)**

Part III – Process monitoring to be completed during the work process at the sub-committee and checked as part of the final approval process by the Committee (Refer to section 3.2.1.3)²

1	The Sub-Committee, at an initial engagement, has allocated sufficient time for technical research and discussion before the target completion date, especially on issues needing to be addressed by more than one sub-committee and for which the timing of relevant sub-committees meetings and exchanges of the result of consideration needed to be carefully examined.	yes
2	The scope of application agreed at the proposal stage was not changed without the approval of the Committee.	yes
3	The technical base document/draft amendment addresses the proposal's issue(s) through the suggested instrument(s); where it does not, the sub-committee offers the Committee an alternative method of addressing the problem raised by the proposal.	yes
4	Due attention has been paid to the <i>Interim guidelines for the systematic application of the grandfather clauses</i> (MSC/Circ.765-MEPC/Circ.315).	yes
5	All references have been examined against the text that will be valid if the proposed amendment enters into force.	n/a
6	The location of the insertion or modified text is correct for the text that will be valid when the proposed text enters into force on a four-year cycle of entry into force, as other relevant amendments adopted might enter into force on the same date.	yes
7	There are no inconsistencies in respect of scope of application between the technical regulation and the application statement contained in regulation 1 or 2 of the relevant chapter, and application is specifically addressed for existing and/or new ships, as necessary.	yes
8	Where a new term has been introduced into a regulation and a clear definition is necessary, the definition is given in the article of the Convention or at the beginning of the chapter.	n/a
9	Where any of the terms "fitted", "provided", "installed" or "installation" are used, consideration has been given to clarifying the intended meaning of the term.	yes

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² Part III should be completed by the drafting/working group that prepared the draft text using "yes", "no" or "not applicable".

Part III – Process monitoring to be completed during the work process at the sub-committee and checked as part of the final approval process by the Committee (Refer to section 3.2.1.3)²

10	All necessary related and consequential amendments to other existing instruments, including non-mandatory instruments, in particular to the forms of certificates and records of equipment required in the instrument being amended, have been examined and included as part of the proposed amendment(s).	yes
11	The forms of certificates and records of equipment have been harmonized, where appropriate, between the Convention and its Protocols.	n/a
12	It is confirmed that the amendment is being made to a currently valid text and that no other bodies are concurrently proposing changes to the same text.	yes
13	All entry-into-force criteria (building contract, keel laying and delivery) have been considered and addressed.	yes
14	Other impacts of the implementation of the proposed/approved amendment have been fully analysed, including consequential amendments to the "application" and "definition" regulations of the chapter.	yes
15	The amendments presented for adoption clearly indicate changes made with respect to the original text, so as to facilitate their consideration.	yes
16	For amendments to mandatory instruments, the relationship between the Convention and the related instrument has been observed and addressed, as appropriate.	n/a
17	The related record format has been completed or updated, as appropriate.	yes

APPENDIX 2*

RECORDS FOR REGULATORY DEVELOPMENT

The following records should be created and kept updated for each regulatory development.

The records can be completed by providing references to paragraphs of related documents containing the relevant information, proposals, discussions and decisions.

1	Title (number and title of regulation(s))
	Paragraph 6.1.1.3 of the LSA Code (Launching and embarkation appliances).
2	Origin of the requirement (original proposal document)
	MSC 96/23/6 (Republic of Korea and IACS).
3	Main reason for the development (extract from the proposal document)
	"The use of a hand-operated mechanism simplifies davit construction and improves the reliability substantially despite that the use of hand-operated mechanism is not in compliance with the existing paragraph 6.1.1.3 of the LSA Code." "Moreover, there is also inconsistency related to the recognition of a hand-operated mechanism of launching appliance within the LSA Code, as a hand-operated mechanism is recognized as one of the acceptable means for launching liferafts (see paragraph 6.1.5 of the LSA Code) and as a secondary launching appliance for free-fall lifeboats (see paragraph 6.1.4.7 of the LSA Code)." "...the acceptance of a hand-operated mechanism would ensure an effective mean to facilitate rescuing and recovering people from the water or survival craft by simplifying the davit construction and improving the reliability of rescue boats' launching appliances in case of an emergency."
4	Related output
	Uniform implementation of paragraph 6.1.1.3 of the LSA Code (5.2.1.28).
5	History of the discussion (approval of work programmes, sessions of sub-committees, including CG/DG/WG arrangements)
	MSC 96 , following consideration of document MSC 96/23/6 (Republic of Korea and IACS), had agreed to include a new output on "Uniform implementation of paragraph 6.1.1.3 of the LSA Code" in the 2016-2017 biennial agenda of the Sub-Committee and the provisional agenda for SSE 4, with a target completion year of 2017 (MSC 96/25, paragraphs 23.29 to 23.31). SSE 4 had for its consideration document SSE 4/5 (Republic of Korea) proposing draft amendments to paragraphs 6.1.1.3 and 6.1.2.2 of the LSA Code, in order that manual means for the launching of rescue boats, which are not one of the ship's survival craft, are accepted, as well as adjusting the provisions related to the arrangements for the mechanism actuation. SSE 4 agreed that the draft amendments should only apply to cargo ships taking into account the view expressed that the application of these amendments to passenger ships might be in

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conflict with SOLAS regulation III/23.2 and that amendments to paragraph 6.1.2.2 of the LSA Code were unnecessary.

SSE 4 also noted the concern expressed by the delegation of the Bahamas, supported by the delegations of Italy, Malta and Norway, that the phrase "without the crew" had been retained in the draft amendment when considering the launching method and the mass criterion, which could lead to the unsafe situation that the operating crew board the rescue boat after it had been turned outboard.

MSC 98, having noted that the concerns expressed at SSE 4 had been reiterated, as well as a number of views related to the scope of application of the amendment, had instructed the Sub-Committee to further consider the draft amendment to paragraph 6.1.1.3 of the LSA Code, taking into account the above-mentioned comments, and advise the Committee accordingly.

SSE 5 agreed to the draft amendments to paragraph 6.1.1.3 of the LSA Code including additional requirements for means that shall be provided for bringing the rescue boat against the ship's side and holding it alongside.

6 Impact on other instruments (e.g. codes, performance standards, guidance circulars, certificates/records format, etc.)

N/A

7 Technical background

7.1 Scope and objective (to cross check with items 4 and 5 in part II of the checklist)

This output is aimed at developing amendments to paragraph 6.1.1.3 of the LSA Code, which will be applicable to cargo ships, in order to facilitate the uniform implementation of the related provisions of the Code and in particular, to allow the use of hand-operated mechanisms for launching rescue boats, which are not one of the ship's survival craft.

7.2 Technical/operational background and rationale (summary of FSA study, etc., if available or, engineering challenge posed, etc.)

Some rescue boats' launching mechanisms have been designed to use hand-operating for lifting the rescue boat from a fixed cradle before the slewing process, or even for slewing the rescue boat to an outboard position before lowering the boat into the water by gravity.

However, the proposal for a new output emphasized that the use of a hand-operated mechanism for launching a rescue boat is not in compliance with the existing paragraph 6.1.1.3 of the LSA Code, which can be confirmed by the increased number of cases where launching appliances for rescue boats have been identified by port State control (PSC) as non-compliant with paragraph 6.1.1.3 of the LSA Code due to the use of a hand-operated mechanism.

7.3 Source/derivation of requirement (non-mandatory instrument, industry standard, national/regional requirement)

Paragraph 6.1.1.3 of the LSA Code.

7.4 Short summary of requirement (what is the new requirement - in short and lay terms)

See section 7.1 above.

7.5	Points of discussions (controversial points and conclusion)
.1	The draft amendment should only apply to cargo ships taking into account the view expressed that the application of these amendments to passenger ships might be in conflict with SOLAS regulation III/23.2.
.2	In the draft amendments, new requirements for means that shall be provided for bringing the rescue boat against the ship's side and holding it alongside is included, in relation to the concern expressed at SSE 4 that the phrase "without the crew" had been retained in the draft amendment when considering the launching method and the mass criterion, which could lead to the unsafe situation that the operating crew board the rescue boat after it had been turned outboard.

ANNEX 2*

DRAFT MSC CIRCULAR

**REVISED GUIDELINES FOR THE DESIGN
AND APPROVAL OF FIXED WATER-BASED FIRE-FIGHTING SYSTEMS FOR RO-RO
SPACES AND SPECIAL CATEGORY SPACES****

1 The Maritime Safety Committee, at its eighty-fourth session (7 to 16 May 2008), approved the *Guidelines for the approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces equivalent to that referred to in resolution A.123(V)* (MSC.1/Circ.1272).

2 The Committee, at its ninetieth session (16 to 25 May 2012), having considered a proposal by the Sub-Committee on Fire Protection, at its fifty-fifth session, with a view to updating and integrating the prescriptive requirements of the Recommendation on fixed fire-extinguishing systems for special category spaces (resolution A.123(V)) and the performance-based requirements of the *Guidelines for the approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces equivalent to that referred to in resolution A.123(V)* (MSC.1/Circ.1272), approved the *Revised guidelines for the design and approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces* (MSC.1/Circ.1430).

3 Noting that MSC.1/Circ.1430 superseded MSC.1/Circ.1272, except that fire and component tests previously conducted in accordance with MSC.1/Circ.1272, remain valid for the approval of new systems. However, existing fixed fire-extinguishing systems for special category spaces approved and installed based on resolution A.123(V), MSC.1/Circ.1272 and MSC.1/Circ.1430 installed before [1 July 2018] should be permitted to remain in service as long as they are serviceable.

4 The Maritime Safety Committee, at its [one-hundredth session (3 to 7 December 2018)], approved revisions to the *Revised guidelines for the design and approval of fixed water-based fire-fighting systems for ro-ro spaces and special category spaces* (MSC.1/Circ.1430), as prepared by the Sub-Committee on Ship Systems and Equipment, at its fifth session, as set out in the annex.

5 Member Governments are invited to apply the revised annexed Guidelines when approving fixed water-based fire-fighting systems for ro-ro spaces and special category spaces installed on or after [1 July 2018] and bring them to the attention of ship designers, shipowners, equipment manufacturers, test laboratories and other parties concerned.

* To be disseminated as MSC.1/Circ.1430/Rev.1.

** Shaded strikeouts denote deleted text and shading highlights new or amended text.

ANNEX

REVISED GUIDELINES FOR THE DESIGN AND APPROVAL OF FIXED WATER-BASED FIRE-FIGHTING SYSTEMS FOR RO-RO SPACES AND SPECIAL CATEGORY SPACES

1 General

1.1 These Guidelines and fire tests are intended for the design and approval of fixed water-based fire-fighting systems for open and closed ro-ro spaces and special category spaces defined in SOLAS regulations II-2/3.12, II-2/3.13, II-2/3.35, II-2/3.36, II-2/3.46 and II-2/3.49. Deluge systems can be applied on open ro-ro spaces when the actual wind condition is taken into consideration, for example through the use of high velocity nozzles. Systems using automatic sprinklers or nozzles are only permitted for closed ro-ro and special category spaces or other spaces where wind conditions are not likely to affect system performance.

1.2 These Guidelines are intended to replace both the prescriptive requirements of resolution A.123(V) for conventional water spray systems and the performance-based requirements of circular MSC.1/Circ.1272 for automatic sprinkler and deluge systems. All systems should comply with sections 1, 2 and 3. In addition, prescriptive-based systems should comply with section 4, and performance-based systems should comply with section 5.

2 Definitions

2.1 *Area of operation* is a design area for wet-pipe, automatic sprinkler system (to be determined for performance-based systems by the test procedure described in the appendix to these Guidelines).

2.2 *Automatic sprinkler or nozzle* is a single or multiple orifice water discharge device that activates automatically when its heat-activated element is heated to its thermal rating or above, allowing water under pressure to discharge in a specific, directional discharge pattern.

2.3 *Automatic system* is a system utilizing either automatic sprinklers or nozzles or a system that is automatically activated by a fire detection system.

2.4 *Deluge system, automatic and manual release* is a system employing open nozzles attached to a piping system connected to a water supply through a valve that can be opened by signals from a fire detection system and by manual operation. When this valve is opened, water flows into the piping system and discharges from all nozzles attached thereto.

2.5 *Deluge system, manual release* is a system employing open nozzles attached to a piping system connected to a water supply through a valve that is opened by manual operation. When this valve is opened, water flows into the piping system and discharges from all nozzles attached thereto.

2.6 *Dry pipe system* is a system employing automatic sprinklers or nozzles attached to a piping system containing air or nitrogen under pressure, the release of which (as from the activation of a sprinkler or nozzle by heat from a fire) permits the water pressure to open a valve known as a dry pipe valve. The water then flows into the piping and discharges from the open nozzles or sprinklers.

2.7 *Fire control* limits the size of a fire by distribution of water so as to decrease the heat release rate, while controlling ceiling gas temperatures and pre-wetting adjacent combustibles and/or reducing heat radiation to avoid structural damage.

2.8 *Fire suppression* is the sharp reduction of the heat release rate of a fire and the prevention of regrowth.

2.9 *K-factor* is a sprinkler nozzle discharge coefficient determined by testing, that is used to calculate flow rate at any given pressure through the relationship $Q = k P^{1/2}$, where Q is the flow rate in litres per minute, and P is the pressure in bars.

2.10 *Open sprinkler or nozzle* is an open single or multiple orifice water discharge device that, when discharging water under pressure, will distribute the water in a specific, directional discharge pattern.

2.11 *Performance-based requirements* are based on the results of fire tests conducted on specific nozzle design and arrangements. The required engineering parameters for such systems are determined by the results of the fire tests.

2.12 *Prescriptive based requirements* are specific requirements, such as minimum water discharge density or maximum nozzle spacing, and are applied equally to all systems designed to this approach.

2.13 *Pump* means a single water pump, with its associated driver and control or an individual pump within a pump unit.

2.14 *Pump unit* means a single water pump, or two or more pumps connected together to form a unit, with their associated driver(s) and controls.

2.15 *Pre-action system* is a system employing automatic sprinklers or nozzles attached to a piping system containing air that may or may not be under pressure, with a supplemental fire detection system installed in the same area as the sprinklers or nozzles. Activation of the fire detection system opens a valve that permits water to flow into the system piping and to be discharged from any sprinkler or nozzle that has operated.

2.16 *Water-based extinguishing medium* is fresh water or seawater, with or without an antifreeze solution and/or additives to enhance fire-extinguishing capability.

2.17 *Water discharge density* is the unit rate of water application to an area or surface expressed in mm/min (equal to (l/min)/m²).

2.18 *Wet pipe system* is a system employing automatic sprinklers or nozzles attached to a piping system containing water and connected to a water supply so that water discharges immediately from sprinklers or nozzles opened by heat from a fire.

3 Principal requirements for all systems

3.1 The system may be automatically activated, automatically activated with provisions for manual activation or manually activated.

3.2 All systems should be divided into sections. Each section should be capable of being isolated by one section control valve. The section control valves should be located outside the protected space, be readily accessible without entering the protected spaces and their locations should be clearly and permanently indicated.

3.2.1 It should be possible to manually open and close the section control valves either directly on the valve or via a control system routed outside of the protected spaces. Means should be provided to prevent the operation of the section control valves by an unauthorized person. Control valve locations should be adequately ventilated to minimize the build-up of smoke.

3.2.2 A continuously manned control station and release station(s) for deluge systems should have remote indication of pump running and pressure in valve manifold. For deluge systems, release stations with controls for start and stop of pump(s) and operation (opening and closing) of section control valves should be provided in the valve room and in a continuously manned control station or the safety centre, if fitted. Remote indication of position of valves (open/closed) should be provided in the continuously manned control station or the safety centre, if fitted.

3.3 The piping system should be sized in accordance with a hydraulic calculation technique¹ such as the Hazen-Williams hydraulic calculation technique or the Darcy-Weisbach hydraulic calculation technique, to ensure the availability of the flows and pressures required for correct performance of the system. The design of the system should ensure that full system pressure is available at the most remote sprinkler or nozzle in each section within 60 s of activation.

3.4 The system supply equipment should be located outside the protected spaces and all power supply components (including cables) should be installed outside of the protected space. The electrical components of the pressure source for the system should have a minimum rating of IP 54.

3.5 Activation of an automatic system should give a visual and audible alarm at a continuously manned station. The alarm in the continuously manned station should indicate the specific section of the system that is activated. The system alarm requirements described within this paragraph are in addition to, and not a substitute for, the detection and fire alarm system required by SOLAS regulation II-2/20.4.

3.6 Wet pipe systems on board vessels that can operate in areas where temperatures below 0°C can be expected, should be protected from freezing either by having temperature control of the space, heating coils on pipes, antifreeze agents or other equivalent measures.

3.7 The capacity of the system water supply should be sufficient for the total simultaneous coverage of the minimum coverage area of tables 4-1 to 4-3 and 5-1 and the vertically applicable area as defined in paragraph 3.22.

3.8 The system should be provided with a redundant means of pumping or otherwise supplying a water-based extinguishing medium to the system. The capacity of the redundant means should be sufficient to compensate for the loss of any single supply pump or alternative source. Failure of any one component in the power and control system should not result in a reduction of required pump capacity of deluge systems. In the case of wet pipe, dry pipe and pre-action systems, failure of any one component in the power and control system should not result in a reduction of the automatic release capability or reduction of required pump capacity

¹ Where the Hazen-Williams Method is used, the following values of the friction factor *C* for different pipe types which may be considered should apply:

<i>Pipe type</i>	<i>C</i>
Black or galvanized mild steel	100
Copper and copper alloys	150
Stainless steel	150

by more than 50%. However, systems requiring an external power source need only be supplied by the main power source. Hydraulic calculations should be conducted to assure that sufficient flow and pressure are delivered to the hydraulically most demanding section both in normal operation and in the event of the failure of any one component.

3.9 The system should be fitted with a permanent sea inlet and be capable of continuous operation during a fire using sea water.

3.10 The system and its components should be designed to withstand ambient temperatures, vibration, humidity, shock, impact, clogging and corrosion normally encountered. Piping, pipe fittings and related components except gaskets inside the protected spaces should be designed to withstand 925°C. Distribution piping should be constructed of galvanized steel, stainless steel, or equivalent. Sprinklers and nozzles should comply with paragraph 3.11.

3.11 The system and its components should be designed and installed based on international standards acceptable to the Organization.² The nozzles should be manufactured and tested based on the relevant sections of appendix A to circular MSC/Circ.1165 (Revised Guidelines for the approval of equivalent water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms).

3.12 A means for testing the automatic operation of the system and, in addition, assuring the required pressure and flow should be provided.

3.13 If the system is pre-primed with water containing a fire suppression enhancing additive and/or an antifreeze agent, periodic inspection and testing, as specified by the manufacturer, should be undertaken to assure that their effectiveness is being maintained. Fire suppression enhancing additives should be approved for fire protection service by an independent authority. The approval should consider possible adverse health effects to exposed personnel, including inhalation toxicity.

3.14 Operating instructions for the system should be displayed at each operating position.

3.15 Installation plans and operating manuals should be supplied to the ship and be readily available on board. A list or plan should be displayed showing spaces covered and the location of the zone in respect of each section. Instructions for testing and maintenance should be available on board.

3.16 Spare parts should be provided as recommended by the manufacturer. In the case of automatic sprinkler systems, the total number of spare sprinkler heads for each type of sprinklers shall be six for the first 300, 12 for the first 1,000.

3.17 Where automatic systems are installed, a warning notice should be displayed outside each entry point stating the type of medium used (i.e. water) and the possibility of automatic release.

3.18 All installation, operation and maintenance instruction/plans for the system should be in the working language of the ship. If the working language of the ship is not English, French or Spanish, a translation into one of these languages should be included.

² Pending the development of international standards acceptable to the Organization, national standards as prescribed by the Administration should be applied.

3.19 Any foam concentrates used as system additives should comply with the *Revised guidelines for the performance and testing criteria and surveys of foam concentrates for fixed fire-extinguishing systems* (MSC.1/Circ.1312).

3.20 Means for flushing of systems with fresh water should be provided.

3.21 The presence of obstructions and the potential for shielding of the water spray should be evaluated to ensure that the system performance is not affected. Supplementary sprinklers or nozzles should be installed beneath obstructions. In addition, nozzles should be located to protect spaces above and below intermediate decks, hoistable decks and ramps. Nozzles below hoistable decks should be capable of protecting all applicable heights.

3.22 Vertically the applicable area of all decks, including hoistable decks or other intermediate decks, between reasonably gas-tight steel decks (or equivalent materials), should be included for simultaneous coverage (*example: with one hoistable deck, both the layer above and below this deck with a dimensioning area complying with tables 4-1 to 4-3 or 5-1 should be included in the water supply calculations*). Decks with ramps are accepted as reasonably gas-tight decks assuming that the ramps are always in their closed position at sea and the ramps and the decks which these ramps are part of are reasonably gas-tight.

~~3.23 All release controls for deluge systems, monitor(s) for any CCTV system, the control panel (or an indication panel) for the fire detection system, water pressure on the discharge side of all pump units, and the position indication of all section valves should be available and grouped together in a continuously manned control station or the safety centre, if provided.~~

3.23 The length of a deluge section (along the lanes) should not be less than 20 m and the width of the section should not be less than 14 m. Further, the sections need not be longer or wider than the distance between reasonably gas-tight steel bulkheads (or equivalent materials). The maximum size of a section on any single deck should be 48 m multiplied by the width of cargo space (measured as distance between tight steel divisions). Vertically one section can cover up to three decks.

4 Additional prescriptive-based system design requirements

In addition to the requirements in section 3, systems designed with this approach should comply with paragraphs 4.1 to 4.10.

4.1 Wet pipe, dry pipe and pre-action systems should be designed for simultaneous coverage of the hydraulically most demanding area at the minimum water discharge density given in tables 4-1 to 4-3. The minimum operating pressure of any sprinkler should be 0.05 MPa.

4.2 Deluge systems should be designed for the simultaneous activation of the two adjacent deluge sections with the greatest hydraulic demand at the minimum water discharge density given in tables 4-1 to 4-3. The minimum operating pressure of any sprinkler should be 0.12 MPa.

Table 4-1 Minimum required water discharge density and area of coverage for decks having a free height equal to or less than 2.5 m

Type of system	Minimum water discharge density (mm/min)	Minimum coverage area
Wet pipe system	6.5	280 m ²
Dry pipe or pre-action system	6.5	280 m ²
Deluge system	5	2 x 20m x B ¹

Table 4-2 Minimum required water discharge density and area of coverage for decks having a free height in excess of 2.5 m but less than 6.5 m

Type of system	Minimum water discharge density (mm/min)	Minimum coverage area
Wet pipe system	15	280 m ²
Dry pipe or pre-action system	15	365 m ²
Deluge system	10	2 x 20 m x B ¹

Table 4-3 Minimum required water discharge density and area of coverage for decks having a free height in excess of 6.5 m but less than 9.0 m

Type of system	Minimum water discharge density (mm/min)	Minimum coverage area
Wet pipe system	20	280 m ²
Dry pipe or pre-action system	20	365 m ²
Deluge system	15	2 x 20 m x B ¹

¹ B = full breadth of the protected space.

4.3 Automatic sprinklers or nozzles intended for decks with a free height equal to or less than 2.5 m should have a nominal operating temperature range between 57°C and 79°C and standard response characteristics. If required by ambient conditions, higher temperature ratings may be acceptable.

4.4 Automatic sprinklers or nozzles intended for decks with a free height in excess of 2.5 m and hoistable decks that can be raised above 2.5 m should have a nominal operating temperature range between 121°C and 149°C and standard response characteristics.

4.5 Sprinklers or nozzles should be positioned at or within 0.6 m of the underside of the deck, in order to distribute water over and between all vehicles or cargo in the area being protected. Automatic sprinklers or nozzles should be positioned and located so as to provide satisfactory performance with respect to both activation time and water distribution. The maximum horizontal spacing between nozzles or sprinklers should not exceed 3.2 m.

4.5 Sprinklers or nozzles should be positioned in such a way that:

- .1 they are not exposed to damage by cargo;
- .2 undisturbed spray is ensured; and
- .3 water is distributed over and between all vehicles or cargo in the area being protected.

Automatic sprinklers or nozzles should be positioned and located so as to provide satisfactory performance with respect to both activation time and water distribution.

4.6 Only upright sprinklers or nozzles are allowed for dry pipe or pre-action systems.

4.7 For wet pipe and dry pipe sprinkler systems, fire detection systems should be installed in accordance with the requirements of SOLAS regulation II-2/20.4.

4.8 For manual deluge systems, automatic deluge systems and pre-action systems, fire detection systems should be provided complying with the International Code for Fire Safety Systems (FSS Code) and the following additional requirements:

- .1 the detection system should consist of flame, smoke or heat detectors of approved types, arranged as described below. The flame detectors should be installed under fixed continuous decks according to the limitation and application defined by the maker and the approval certificate. The smoke and heat detector arrangement shall comply with the FSS Code. Smoke detectors with a spacing not exceeding 11 m or heat detectors with a spacing not exceeding 9 m should be installed under hoistable ramps;
- .2 the detection system should ensure rapid operation while consideration should also be given to preventing accidental release. The area of coverage of the detection system sections should correspond to the area of coverage of the extinguishing system sections. The following arrangements are acceptable:
 - .1 set-up of approved flame detectors and approved smoke detectors or heat detectors; or
 - .2 set-up of approved smoke detectors and approved heat detectors; other arrangements can be accepted by the Administration;
- .3 for automatic deluge systems and pre-action systems, the discharge of water should be controlled by the detection system. The detection system should provide an alarm upon activation of any single detector and discharge if two or more detectors activate. The Administration may accept other arrangements; and
- .4 automatically released systems should also be capable of manual operation (both opening and closing) of the section valves. Means should be provided to prevent the simultaneous release of multiple sections that result in water-flow demand in excess of the pumping system design capacity. The automatic release may be disconnected during on- and off-loading operations, provided that this function is automatically reconnected after a pre-set time being appropriate for the operations in question.

4.9 Where beams project more than 100 mm below the deck, the spacing of spot-type heat detectors at right angles to the direction of the beam travel should not be more than two thirds of the spacing permitted under chapter 9 of the FSS Code.

4.10 Where beams project more than 460 mm below the deck and are more than 2.4 m on centre, detectors should be installed in each bay formed by the beams.

5 Additional performance-based system design requirements

In addition to the requirements in section 3, systems designed with this approach should comply with paragraphs 5.1 to 5.6.

5.1 The system should be capable of fire suppression and control and be tested to the satisfaction of the Administration in accordance with the appendix to these Guidelines.

5.2 The nozzle location, type of nozzle and nozzle characteristics should be within the limits tested to provide fire suppression and control as referred to in paragraph 5.1.

5.3 System designs should be limited to the use of the maximum and minimum temperature ratings of the thermally sensitive fire detection devices tested to provide fire suppression and control as referred to in paragraph 5.1.

5.4 The capacity of the system water supply should be sufficient for the total simultaneous coverage of the minimum coverage area of table 5-1 and the vertically applicable area as defined in paragraph 3.22, and the requirements of paragraph 5.5.

Table 5-1 Minimum coverage area per type of system

Type of system (Definition number)	Minimum coverage area
A. Wet pipe, automatic sprinkler heads (2.18)	280 m ² or area of operation as defined in the fire tests - whichever is larger
B. Deluge system, automatic ¹ and manual release (2.4)	280 m ² and the overlapping or adjacent section as defined by paragraph 5.5 ²
C. Deluge system, manual release (2.5)	2 sections each of min 20 m x B ^{2,3}
D. Other systems (2.6, 2.15)	Equivalent to the above systems and to the satisfaction of the Administration

¹ The automatic release should comply with the requirements of paragraph 5.6.

² The pump should be sized to cover the largest section for type B systems and the two largest horizontally adjacent sections for type C systems.

³ B = full breadth of the protected space.

5.5 The section arrangement for a deluge system with automatic and manual release (system B) should be such that a fire in any location of the border zone between two or more sections would be completely surrounded by activated spray heads, either by activating more than one section or by overlapping sections (whereby two or more sections cover the same area in the vicinity of the border between sections). In case of overlapping sections, such overlap should be a minimum of two times the required spray head spacing of the section in question or five metres, whichever is larger. These overlapping sections need not comply with the minimum width and length requirements of paragraph 3.23.

5.6 For systems of type B (see table 5-1) an efficient fire detection and fire confirmation system covering all parts of the ro-ro or special category spaces should be provided as follows:

- .1 the fire detection system shall consist of flame detectors and smoke detectors of approved types. The flame detectors shall be installed under fixed continuous decks according to the limitation and application defined by the maker and the approval certificate. The smoke detector arrangement shall comply with the FSS Code. Additional smoke detectors with a spacing not exceeding 11 m shall be installed under hoistable ramps;
- .2 a colour TV monitoring system should cover all parts of the ro-ro or special category spaces. Cameras need not be installed below hoistable decks if the camera arrangement can identify smoke (confirm fire) based on positions under a fixed continuous deck. The monitors for the colour TV monitoring system should be located in the continuously manned control station having the controls for section control valves and start/stop control of pumps addressed under 3.2.2; and
- .3 the relevant section of the deluge system should be automatically released when two detectors covering this area activate. Systems being released when only one detector activates may also be accepted. Automatically released systems should also be capable of manual operation (both opening and closing) of the section valves. The automatic release may be disconnected during on- and off-loading operations, provided that this function is automatically reconnected after a preset time being appropriate for the operations in question.

APPENDIX

TEST METHOD FOR FIXED WATER-BASED FIRE-FIGHTING SYSTEMS FOR RO-RO SPACES AND SPECIAL CATEGORY SPACES

1 SCOPE

1.1 This test method is intended for evaluating the effectiveness of fixed water-based fire-fighting systems installed in ro-ro spaces and special category spaces with deck heights up to and including 5 m and/or up to and including 2.5 m.

1.2 The test programme has two objectives:

- .1 establishing nozzle location, nozzle characteristics, minimum water delivery rate and minimum water pressure for systems which will provide the required level of system response time, suppression and control; and
- .2 establishing the minimum area of operation of the system for the purpose of determining hydraulic design requirements for wet pipe, dry pipe and preaction systems.

2 GENERAL REQUIREMENTS

2.1 Sampling

The nozzles and other components to be tested should be supplied by the manufacturer together with design and installation criteria, operational instructions, drawings and technical data sufficient for the identification of the components.

2.2 Tolerances

Unless otherwise stated, the following tolerances should apply:

- .1 length: $\pm 2\%$ of value;
- .2 volume: $\pm 5\%$ of value;
- .3 pressure: $\pm 3\%$ of value; and
- .4 temperature: $\pm 2\%$ of value.

2.3 Observations

The following observations should be made during and after each test:

- .1 time of ignition;
- .2 activation time of first nozzle;
- .3 time when water flows out through first nozzle;
- .4 time when water flow is shut off;

- .5 time when the test is terminated; and
- .6 total number of activated nozzles.

2.4 Test hall and environmental conditions

The test hall where the tests are conducted should have a minimum floor area of 300 m² and a ceiling height in excess of 8 m. The test hall may be equipped with a forced ventilation system, or be natural ventilated, in order to ensure that there is no restriction in air supply to the test fires. The test hall should have an ambient temperature of between 10 and 25°C at the start of each test.

2.5 Measurement equipment

Temperatures should be measured using plain K-type thermocouple wires not exceeding 0.5 mm in diameter. The thermocouple head should be protected against direct water impingement, e.g. by tin cans.

System water pressure should be measured by using suitable equipment. Total water flow rate should be determined by a direct measurement or indirectly by using the pressure data and "k" factor of the nozzles.

The measurements should be made continuously throughout the tests.

2.6 System operational conditions

The tests should simulate the conditions of an actual installed system regarding objectives such as time delays between the activation of the system and minimum system water pressure or water delivery. In addition, the use of a pre-primed fire suppression enhancing additive, if applicable, should be taken into account.

3 DETERMINATION OF FIRE SUPPRESSION AND CONTROL CAPABILITIES

3.1 Principle

These test procedures test the effectiveness of a water-based fire-fighting system against two different scenarios: a cargo fire in a simulated freight truck, and a passenger vehicle fire.

3.2 Fire source

3.2.1 The primary fire source for both scenarios consists of EUR standard wood pallets (ISO 6780:2003), stored inside with the moisture content of $14 \pm 2\%$. Figure 3.2.1 shows details of a EUR pallet.

3.2.2 Plywood panels made of pine or spruce are used as targets. The panels should be approximately 12 mm thick. The ignition time of the panel should not be more than 35 s and the flame spread time at 350 mm position should not be more than 100 s as measured in accordance with resolution A.653(16).

3.2.3 For ignition, commercial heptane should be applied.

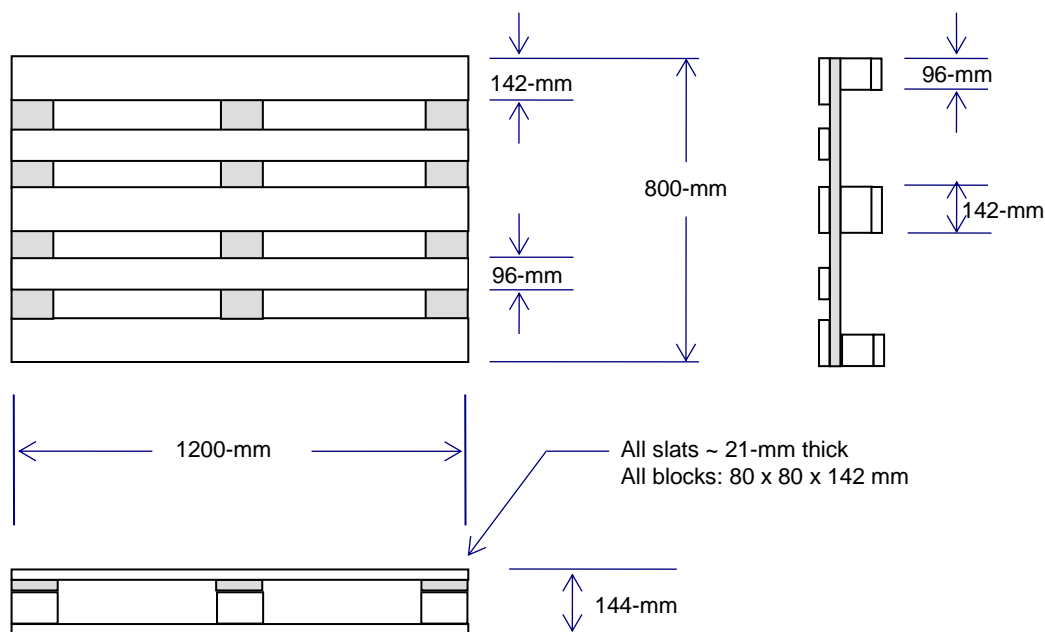


Figure 3.2.1 – Typical dimensions of the standard EUR pallet

3.3 Apparatus

3.3.1 Test area

The tests should be conducted in a test hall as specified in paragraph 2.4 above, under a flat, smooth, non-combustible ceiling of at least 100 m². There should be at least a 1 m space between the perimeters of the ceiling and any wall of the test hall.

3.3.2 *Fire scenario 1: cargo fire in a simulated freight truck* (see figures 3.3.2.1 to 3.3.2.3)

3.3.2.1 The primary fuel package consists of 112 wood pallets arranged in an array of 2 (wide) x 7 (high) x 8 (long) and raised up on a level of 2.8 m so that the top level of the fuel package is at 3.8 to 3.9 m above the floor.

3.3.2.2 The support frame for the wood pallet array of paragraph 3.3.2.1 should be constructed using open steel racks. The wood pallet piles should be standing freely on horizontal steel beams without any solid bottoms.

3.3.2.3 The fuel pallet array should be half-shielded by a 4.5 m long, 2.6 m wide steel plate (thickness at least 2 mm) at 4 m height. The plate should be properly fixed so that during a test it does not bend to provide an unobstructed passage of water onto the fuel package.

3.3.2.4 Plywood panel targets (acting also as obstructions) of dimensions 3.6 m (wide) x 2.4 m (high) should be arranged symmetrically on both sides of the fuel package at 1 m distance so that the top edge is at the same level as the top level of the wood pallet array.

3.3.2.5 The fire should be ignited by two steel trays centrally located under the fuel package as shown in figures 3.3.2.1 to 3.3.2.3. The square trays are 25 cm high and 0.1 m² of free surface area. The trays should be filled with water and 1 l of heptane so that the free rim height above the liquid surface is 4 cm. The distance between the bottom of the wood pallet piles and liquid surface is 29 cm.

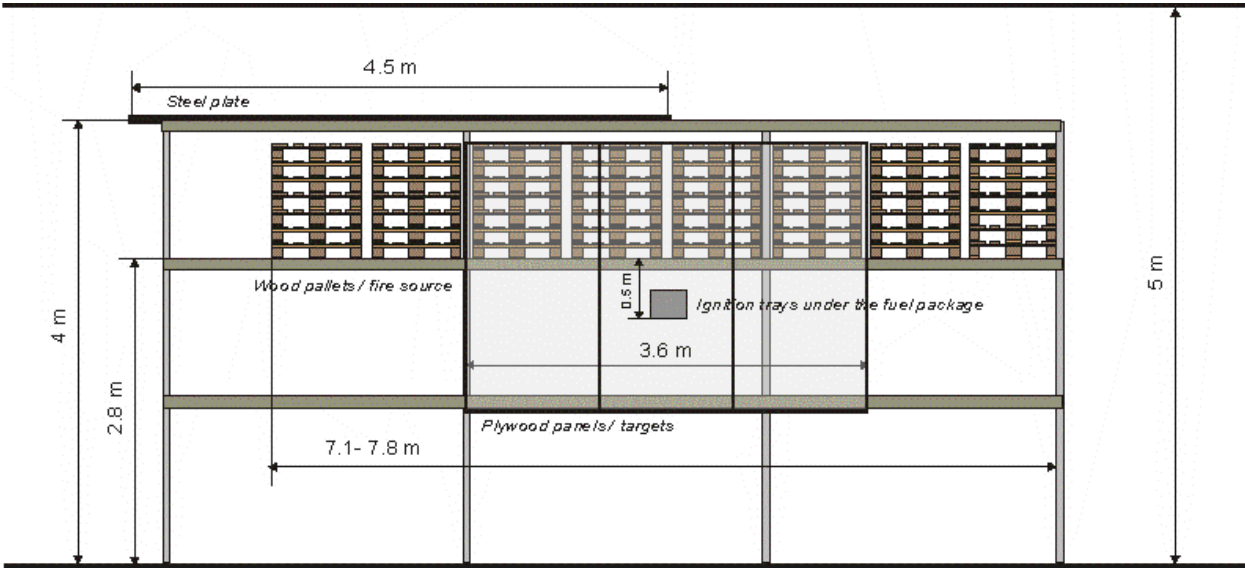


Figure 3.3.2.1 – Side view of the cargo fuel package in a simulated truck

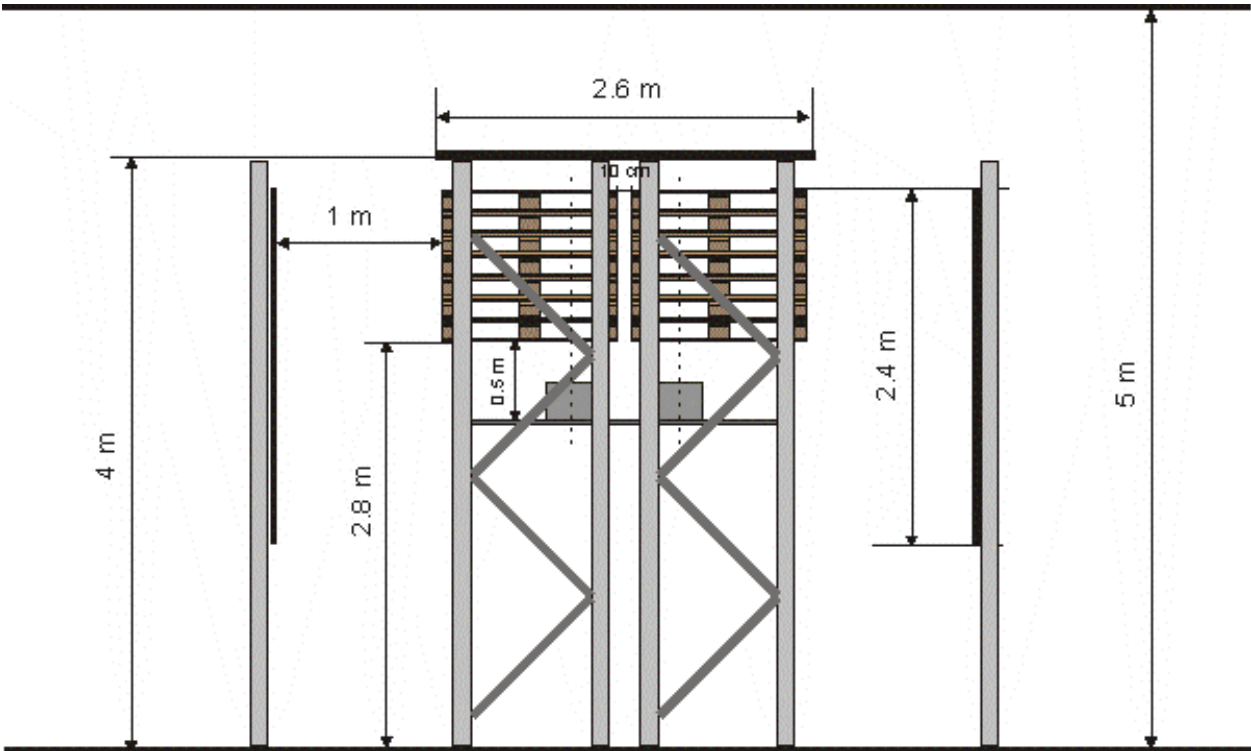


Figure 3.3.2.2 – End view of the cargo fuel package in a simulated truck

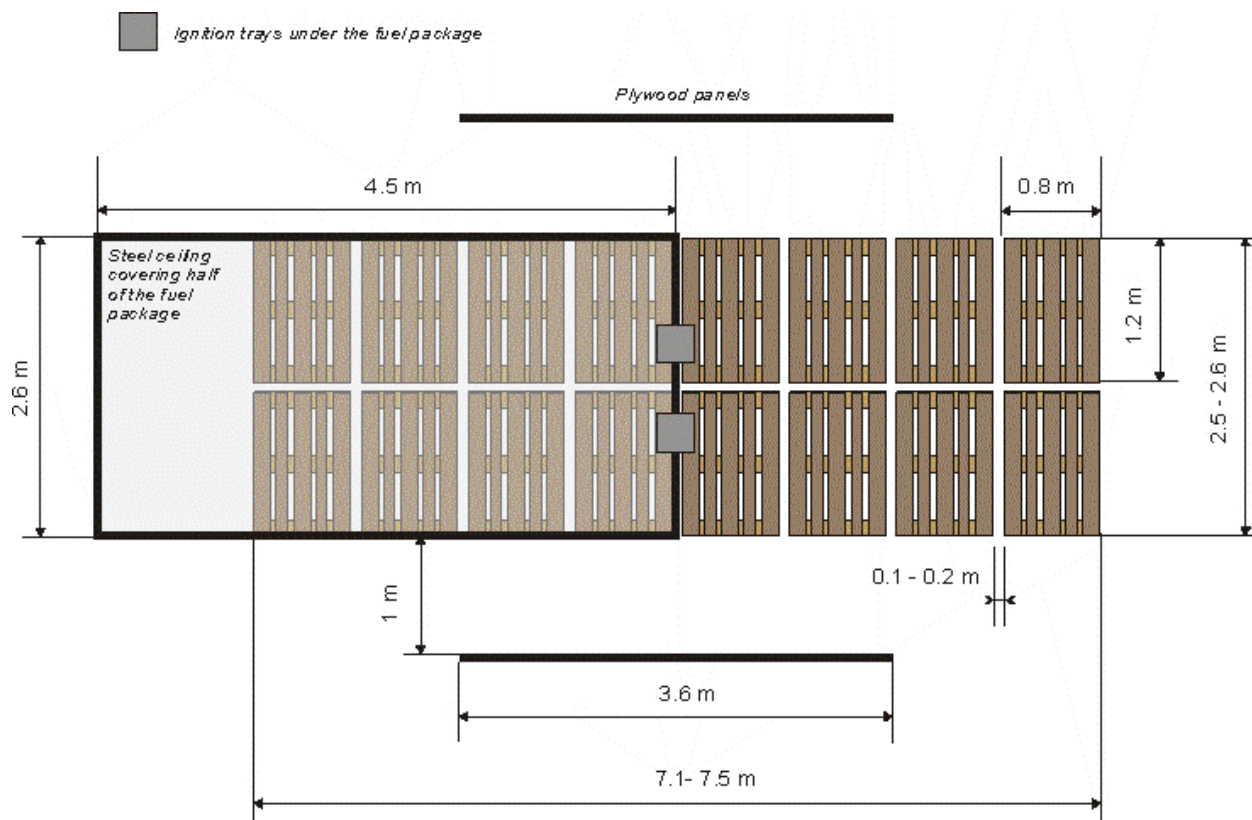


Figure 3.3.2.3 – Top view of the cargo fuel package in a simulated truck

3.3.3 **Fire scenario 2: passenger vehicle fire** (see figures 3.3.3.1 and 3.3.3.2)

3.3.3.1 The primary fuel package consists of 12 wood pallets arranged in an array of 1 pallet (wide) x 6 pallets (high) x 2 pallets (long) constructed inside a passenger vehicle mock-up.

3.3.3.2 The passenger vehicle mock-up is constructed of nominally 2 mm steel.

3.3.3.3 Plywood panel targets (acting also as obstructions) of dimensions 1.2 m (wide) x 1.75 m (high) should be arranged symmetrically on both sides of the mock-up at 0.6 m distance so that the top edge is at the same level as the top level of the mock-up car.

3.3.3.4 The fire should be ignited by a steel tray centrally located under the fuel package as shown in figures 3.3.3.1 and 3.3.3.2. The square tray is 10 cm high and 0.1 m² of free surface area. The tray should be filled with water and 1 l of heptane so that the free rim height above the liquid surface is 4 cm.

3.4 **Nozzle positioning**

3.4.1 Nozzles should be installed in an array at the ceiling level in accordance with the manufacturer's design and installation criteria. Tests should be repeated with three different relative locations between the nozzle array and the fuel package, i.e. centre of ignition under one nozzle, between two nozzles and between four nozzles, as shown in figure 3.4.1.

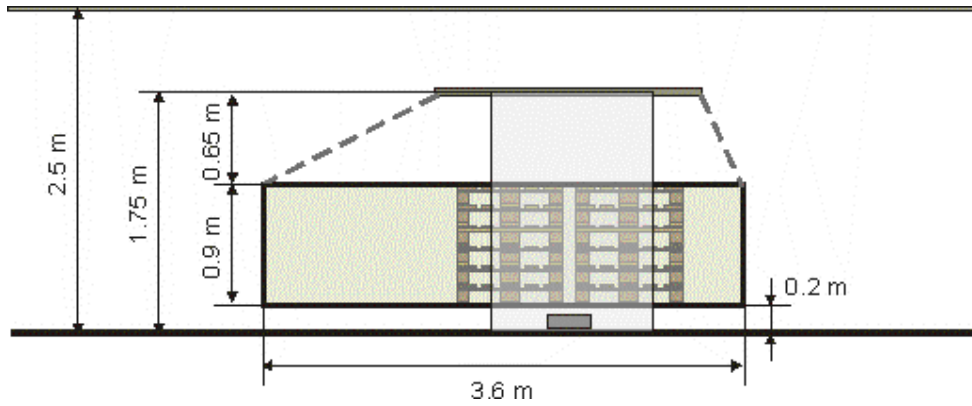


Figure 3.3.3.1 – Side view of the passenger vehicle fuel package
(The dashed lines visualize the shape of a car; the ceiling plate is to be fixed in its location as found most practical)

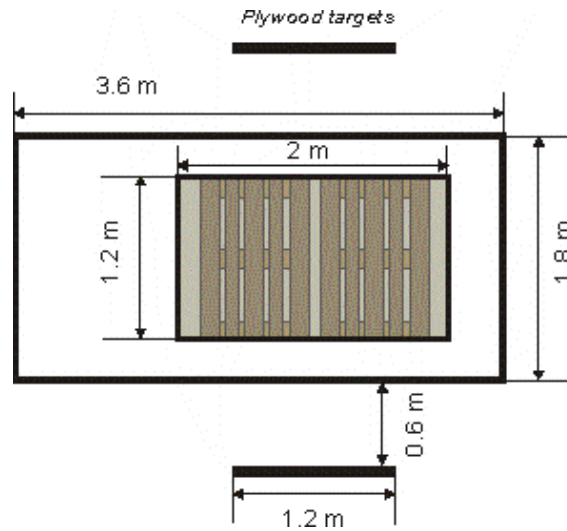


Figure 3.3.3.2 – Top view of the passenger vehicle fuel package

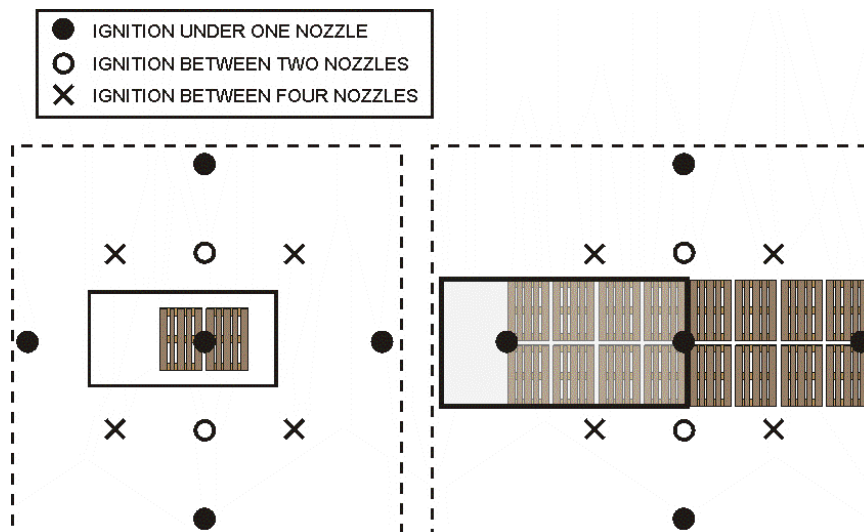


Figure 3.4.1 – Nozzle positioning in the two scenarios

3.5 Instrumentation

3.5.1 Instrumentation for the continuous measuring and recording of test conditions should be employed. At least the following measurements should be made:

- .1 gas temperature at 7.5 cm below the ceiling at locations shown in figure 3.5.1;
- .2 gas temperature at the targets to indicate ignition of targets as shown in figure 3.5.2; and
- .3 system water pressure near the centre of the piping array.

3.5.2 System water flow rate should be defined with suitable means for the system.

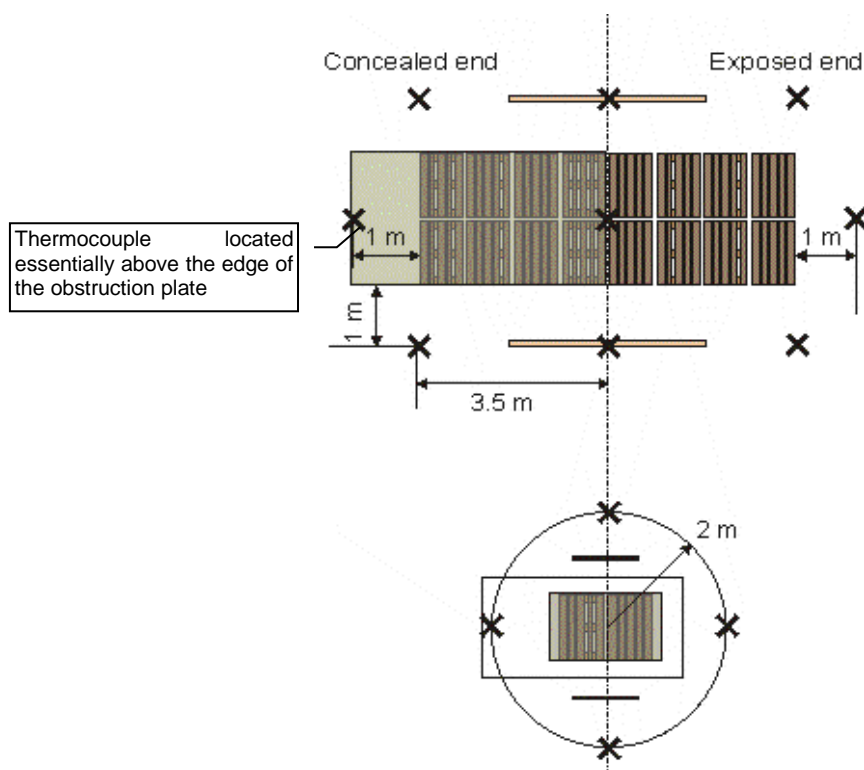


Figure 3.5.1 – Thermocouple locations in the two scenarios³

³ For the truck fuel package the three locations at both ends are used for acceptance evaluation, the three locations at and around the centre of ignition are for safety purposes to define during the test whether the ceiling is at danger. For the passenger car fuel package all four locations are used for acceptance evaluation.

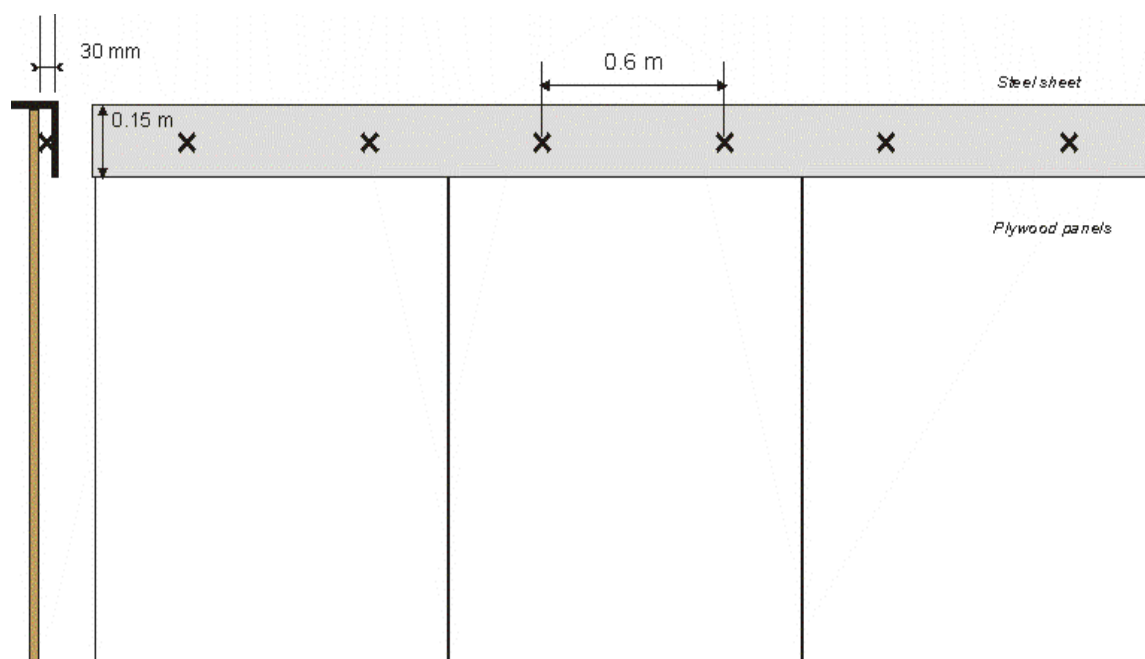


Figure 3.5.2 – Thermocouple locations at the plywood targets for determining ignition of targets⁴

3.6 Test programme and test procedure

3.6.1 Test programme

3.6.1.1 Tests should be conducted at the minimum system water pressure at the minimum distance between the lowest part of the nozzles and the ceiling, as specified by the manufacturer.

3.6.1.2 Three tests should be conducted at ceiling heights 5 m and/or 2.5 m, with different nozzle grid locations relative to the fuel package as specified in figure 3.4.1.

3.6.2 Test procedure

3.6.2.1 Prior to starting the test the moisture content of the fuel package should be measured at several locations along the full package with a probe-type moisture meter and the results should be reported.

3.6.2.2 The actual test procedure for all tests is as follows:

- .1 the water pressure used at the start of the test should be set at the minimum value for the system specified by the manufacturer, flowing six open nozzles. If more than six nozzles operate during the test, the water supply pressure should be adjusted accordingly, to keep the required minimum system water pressure;

⁴ A thin (about 1 mm) steel sheet is bent on top of the plywood panels as shown in the figure. Plain charring of panels is seen as a sharp edge between the black charring on the exposed surface and intact surface under the metal sheet. When ignited in flames charring is seen also under the sheet and verified by significant increase in the gas temperature under the metal sheet.

- .2 the tray should be filled with 1 litre of heptane on the water base as described in paragraph 3.3.2.5 or 3.3.3.4;
- .3 the measurements are started;
- .4 the flammable liquid pool fire(s) should be lit by means of a torch or a match;
- .5 the fire should be allowed to burn freely for a period of 2.5 min;*
- .6 the test is continued for 30 min after system activation;
- .7 any remaining fire should be manually extinguished; and
- .8 the test is terminated.

3.7 Acceptance criteria

The principal acceptance criteria are based on the following factors:

- .1 gas temperatures measured at locations not directly affected by impinging flames;
- .2 damage to the fuel package; and/or
- .3 ignition of targets.

Note 1: Damage to the fuel package is defined by the fraction of charring of the full package. The damage to each individual wood pallet should be evaluated separately and the total fraction calculated based on the detailed results. Totally black, i.e. totally charred pallet is denoted as 100% damage of the pallet (even though the pallet may have maintained its shape) and totally intact pallet is denoted as 0% damage. Partially charred pallets should be visually evaluated. Proper and adequate photographs of the damaged fuel package should be included in the test report.

Note 2: Ignition of targets is defined by the method described in figure 3.5.2, if the visibility during the test is such that it cannot be visually observed.

3.7.1 *Fire scenario 1: cargo fire in a simulated freight truck (ceiling height 5 m)*

The following four criteria should be met:

- .1 after system activation the maximum five minute average at any of the three measurement locations at the exposed end of the fuel package should not exceed 300°C;
- .2 after system activation the maximum five minute average at any of the three measurement locations at the concealed end of the fuel package should not exceed 350°C;

* If automatic sprinklers activate already during the 2.5 min pre-burn period, feeding water to the system should be delayed till after the 2.5 min.

- .3 total damage to the wood pallet array should not exceed 45% as defined after the test; and
- .4 the plywood targets should not ignite during the test.

3.7.2 ***Fire scenario 2: passenger vehicle fire***

The following two criteria should be met:

- .1 after system activation the maximum five minute average at any of the four measurement locations should not exceed 350°C; and
- .2 the plywood targets should not ignite during the test.

4 DETERMINATION OF AREA OF OPERATION

4.1 Both fire scenarios include hidden fires that burn intensely throughout the tests. The suppression tests as defined in paragraph 3.6.1 can be applied in establishing the area of operation of wet pipe, dry pipe and pre-action systems. The evaluation is based on the test with the largest number of nozzles activating.

4.2 The ceiling area of 100 m² as defined in paragraph 3.3.1 most likely is not sufficient for defining the area of operation. The ceiling should be large enough to allow installation of a sufficient number of nozzles so that it is unambiguous that the nozzles activating truly represent the maximum number of active nozzles.

4.3 The area of operation is determined by multiplying the largest number of nozzles activating in the tests by two and defining the corresponding coverage area.

5 TEST REPORT

The test report should, as a minimum, include the following information:

- .1 name and address of the test laboratory;
- .2 date of issue and identification number of the test report;
- .3 name and address of applicant;
- .4 name and address of manufacturer or supplier of the nozzles;
- .5 test method and purpose;
- .6 nozzle identification;
- .7 description of the tested nozzles and system performance;
- .8 detailed description of the test set-up including drawings and photos of the fuel package and targets before and after the tests;
- .9 date of tests;
- .10 measured nozzle pressure and flow characteristics;

- .11 identification of the test equipment and used instruments;
- .12 test results including observations and measurements made during and after the test;
- .13 deviations from the test method;
- .14 conclusions; and
- .15 date of the report and signature.

ANNEX 3

DRAFT AMENDMENTS TO CHAPTER 15 OF THE FSS CODE*

CHAPTER 15 INERT GAS SYSTEMS

2.2.3.2 Inert gas lines

1 Paragraph 2.2.3.2.1 is amended as follows:

"2.2.3.2.1 The inert gas main may be divided into two or more branches ~~forward of~~ ~~downstream of~~ the non-return devices required by paragraph 2.2.3.1."

2 Paragraph 2.2.3.2.6 is amended as follows:

"2.2.3.2.6 Arrangements shall be provided to enable the inert gas main to be connected to an external supply of inert gas. The arrangements shall consist of a 250 mm nominal pipe size bolted flange, isolated from the inert gas main by a valve and located ~~forward of~~ ~~downstream of~~ the non-return valve. The design of the flange should conform to the appropriate class in the standards adopted for the design of other external connections in the ship's cargo piping system."

2.2.4 Indicators and alarms

3 Paragraph 2.2.4.2 is amended as follows:

"2.2.4.2 Instrumentation shall be fitted for continuously indicating and permanently recording, when inert gas is being supplied:

- .1 the pressure of the inert gas mains ~~forward of~~ ~~downstream of~~ the non-return devices; and
- .2 the oxygen content of the inert gas"

* Shaded strikeouts denote deleted text and shading highlights new or amended text.

ANNEX 4*

DRAFT MSC CIRCULAR

**UNIFIED INTERPRETATIONS OF CHAPTER 15
OF THE FSS CODE (MSC.1/CIRC.1582)****

1 The Maritime Safety Committee, at its ninety-eighth session (7 to 16 June 2017), with a view to providing more specific guidance on requirements related to inert gas systems on tankers, approved *Unified interpretations of chapter 15 of the FSS Code (MSC.1/CIRC.1582)*, which was prepared by the Sub-Committee on Ship Systems and Equipment, at its fourth session (20 to 24 March 2017).

2 The Maritime Safety Committee, at its [one-hundredth session (3 to 7 December 2018)], with a view to disseminating information of pending corrections to paragraphs 15.2 of the FSS Code, approved a revision of the *Unified interpretations of chapter 15 of the FSS Code (MSC.1/Circ.1582)*, as an interim solution, until the entry into force of the associated amendments, as prepared by the Sub-Committee on Ship Systems and Equipment, at its fifth session (12 to 16 March 2018), set out in the annex.

3 Member States are invited to use the annexed unified interpretations as guidance when applying paragraphs 15.2.2.2.2, 15.2.2.3.2.1, 15.2.2.3.2.2, 15.2.2.3.2.6, 15.2.2.4.1, 15.2.2.4.2.1, and 15.2.2.4.5 of chapter 15 of the FSS Code, and to bring the unified interpretations to the attention of all parties concerned.

* To be disseminated as MSC.1/Circ.1582/Rev.1.

** Strikeouts denote deleted text and shading highlights new or amended text.

ANNEX

UNIFIED INTERPRETATIONS OF CHAPTER 15 OF THE FSS CODE

CHAPTER 15 – INERT GAS SYSTEMS

Paragraph 15.2.2.2.2

The automatic shutdown of the inert gas system and its components should involve the following:

- .1 shutdown of fans and closing of regulating valve for the following:
 - .1 high water level in scrubber (not applicable for N₂);
 - .2 low pressure/flow to scrubber (not applicable for N₂); or
 - .3 high-high temperature of inert gas supply.
- .2 closing of regulating valve in the event of:
 - .1 high oxygen content (in excess of 5% by volume); or
 - .2 failure of blowers/fans or N₂ compressors.
- .3 activation of double-block and bleed arrangement upon:
 - .1 loss of inert gas supply (for ships with double block and bleed replacing water seal); or
 - .2 loss of power.

Paragraph 15.2.2.3.2.1

Where the words "forward of" are used, these words should be interpreted to mean "downstream of".

Paragraph 15.2.2.3.2.2

Unambiguous information regarding the operational status of stop valves in branch piping leading from the inert gas main to cargo tanks means position indicators providing open/intermediate/closed status information in the control panel required in paragraph 15.2.2.4. Limit switches should be used to positively indicate both open and closed positions. Intermediate position status should be indicated when the valve is in neither open nor closed position.

Paragraph 15.2.2.3.2.6

Where the words "forward of" are used, these words should be interpreted to mean "downstream of".

Paragraph 15.2.2.4.1

The operational status of the inert gas system should be based on indication that inert gas is being supplied downstream of the gas regulating valve and on the pressure or flow of the inert gas mains ~~upstream~~ downstream of the non-return devices. However, the operational status of the inert gas system as required in paragraph 15.2.2.4.1 should not be considered to require additional indicators and alarms other than those specified in paragraphs 15.2.2.4 and 15.2.3.2 or 15.2.4.2, as appropriate.

Paragraph 15.2.2.4.2.1

Where the words "forward of" are used, these words should be interpreted to mean "downstream of".

Paragraph 15.2.2.4.5.3

The term "alarm system independent" means that a second pressure sensor, independent of the sensor serving the alarms for low pressure, high pressure and pressure indicator/recorder should be provided. Notwithstanding the above, a common programmable logic controller (PLC) should, however, be accepted for the alarms in the control system. The independent sensor should not be required if the system is arranged for the shutdown of cargo pumps. If a system for shutdown of cargo pumps is arranged, an automatic system shutting down all cargo pumps should be provided. The shutdown should be alarmed at the control station. The shutdown should not prevent the operation of ballast pumps or pumps used for bilge drainage of a cargo pump room.

ANNEX 5

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATION OF PARAGRAPH 4.4.8.1 OF THE LSA CODE

1 The Maritime Safety Committee, at its [one-hundredth session (3 to 7 December 2018)], with a view to providing more specific guidance on the provision of buoyant oars and related equipment for lifeboats, approved the Unified interpretation of paragraph 4.4.8.1 of the LSA Code, prepared by the Sub-Committee on Ship Systems and Equipment, at its fifth session (12 to 16 March 2018), as set out in the annex.

2 Member States are invited to use the annexed Unified interpretation as guidance when applying the provisions of paragraph 4.4.8.1 of the LSA Code and to bring the Unified interpretation to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATION OF PARAGRAPH 4.4.8.1 OF THE LSA CODE

SECTION 4.4 – LIFEBOATS, GENERAL

Paragraph 4.4.8.1

For a lifeboat equipped with two independent propulsion systems, where the arrangement consists of two separate engines and shaft lines, fuel tanks, piping systems and any other associated ancillaries, paragraph 4.4.8.1 of the LSA Code need not be applied. For all other aspects, the lifeboat should be in full compliance with paragraph 4.4.8 of the LSA Code.

ANNEX 6

**BIENNIAL STATUS REPORT AND OUTPUTS ON THE COMMITTEE'S POST-BIENNIAL AGENDA
THAT FALL UNDER THE PURVIEW OF THE SUB-COMMITTEE**

BIENNIAL STATUS REPORT APPROVED BY SSE 5

SUB-COMMITTEE ON SHIP SYSTEMS AND EQUIPMENT (SSE)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
1. Improve implementation	1.20	Uniform implementation of paragraph 6.1.1.3 of the LSA Code	2018	MSC	SSE		Completed		MSC 96/25, paragraph 23.28; SSE 5/17, section 5
2. Integrate new and advancing technologies in the regulatory framework	2.3	Amendments to the IGF Code and development of guidelines for low-flashpoint fuels	2019	MSC	HTW/PPR/SDC/SSE	CCC	No work requested		MSC 94/21, paragraphs 18.5 and 18.6; MSC 98/23, annex 38
2. Integrate new and advancing technologies in the regulatory framework	2.5	Safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III	2019	MSC	SSE		In progress		MSC 82/24, paragraph 3.92; MSC 98/23, annex 38; SSE 5/17, section 3
2. Integrate new and advancing technologies in the regulatory framework	2.8	Development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, if necessary	2020	MSC	III/SDC HTW	SSE	In progress		MSC 98/23, paragraph 20.36; SSE 5/17, section 13
Note: Description amended and HTW was added as associated organ									

SUB-COMMITTEE ON SHIP SYSTEMS AND EQUIPMENT (SSE)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
2. Integrate new and advancing technologies in the regulatory framework	2.10	Revision of SOLAS chapters III and IV for Modernization of the GMDSS, including related and consequential amendments to other existing instruments	2021	MSC	HTW/SSE	NCSR	No work requested		MSC 98/23, paragraph 20.27
2. Integrate new and advancing technologies in the regulatory framework	2.14	Amendments to regulation 14 of MARPOL Annex VI to require a dedicated sampling point for fuel oil	2019	MEPC	SSE	PPR	No work requested		
6. Ensure regulatory effectiveness	6.1	Unified interpretation of provisions of IMO safety, security and environment-related conventions	Continuous	MSC MEPC	III/PPR/CCC/ SDC/SSE/N CSR		Ongoing		SSE 5/17, section 12
Note: A 28 expanded the output to include all proposed unified interpretations to provisions of IMO safety, security, and environment-related Conventions.									
OW. Other work	OW 27	Amendments to chapter 9 of the FSS Code for fault isolation requirements for cargo and passenger ship cabin balconies fitted with individually identifiable fire detector systems	2020	MSC	SSE		No work requested		MSC 98/23, paragraph 20.34; SSE 5/17, annex 6
Note: MSC 98 agreed to include this output in the provisional agenda for SSE 6.									

SUB-COMMITTEE ON SHIP SYSTEMS AND EQUIPMENT (SSE)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
OW. Other work	OW 31	Revised SOLAS regulation II-1/3-8 and associated guidelines (MSC.1/Circ.1175) and new guidelines for safe mooring operations for all ships	2019	MSC	HTW/SSE	SDC	No work requested		MSC 95/22, paragraph 19.22; MSC 98/23, paragraph 10.20
OW. Other work	OW 34	Requirements for onboard lifting appliances and anchor handling winches	2019	MSC	HTW	SSE	In progress		MSC 89/25, paragraph 22.26; MSC 98/23, annex 38; SSE 5/17, section 10
Note: SSE changed from associated to coordinating organ and HTW added as associated organ									
OW. Other work	OW 36	Review SOLAS chapter II-2 and associated codes to minimize the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships	2019	MSC	HTW/SDC	SSE	In progress		MSC 97/22, paragraph 19.19; SSE 5/17, section 7
OW. Other work	OW 37	Revised SOLAS regulations II-1/13 and II-1/13-1 and other related regulations for new ships	2019	MSC	SDC	SSE	In progress		MSC 95/22, paragraphs 19.20 and 19.32; MSC 98/23, annex 38; SSE 5/17, section 11
OW. Other work	OW 39	Amendments to MSC.1/Circ.1315	2019	MSC	SSE		In progress		MSC 98/23, paragraph 20.37; SSE 5/17, section 9

SUB-COMMITTEE ON SHIP SYSTEMS AND EQUIPMENT (SSE)									
Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ	Status of output for Year 1	Status of output for Year 2	References
OW. Other work	OW 43	Consequential work related to the new International Code for Ships Operating in Polar Waters	2019	MSC	SSE/NCSR	SDC	In progress		MSC 93/22, paragraphs 10.44, 10.50 and 20.12; MEPC 68/21, paragraph 6.13
OW. Other work	OW 47	Develop new requirements for ventilation of survival craft	2019	MSC	SSE		Extended		MSC 97/22, paragraph 19.22; SSE 5/17, section 4
Note: Target completion year extended from originally 2018 to 2019, change from "crafts" to "craft"									
OW. Other work	OW 48	Amendments to the FSS Code for CO ₂ pipelines in under-deck passageways	2018	MSC	SSE		Completed		MSC 96/25, paragraph 23.26; SSE 5/17, section 8

OUTPUTS ON THE COMMITTEE'S POST-BIENNIAL AGENDA THAT FALL UNDER THE PURVIEW OF THE SUB-COMMITTEE

SHIP SYSTEMS AND EQUIPMENT (SSE)								
ACCEPTED POST-BIENNIAL OUTPUTS				Parent organ(s)	Associated organ(s)	Coordinating organ	Timescale (sessions)	Reference
Number	Biennium	Reference to Strategic Direction, if applicable	Description					
150	2016-2017	SD 2 (Integrate new and advancing technologies in the regulatory framework)	Revision of SOLAS chapter III and the LSA Code to remove gaps, inconsistencies and ambiguities based on the safety objectives, functional requirements and expected performance for SOLAS chapter III	MSC	SSE		5	MSC 98/23, paragraph 20.41
9	2012-2013	OW (Other work)	Revision of the provisions for helicopter facilities in SOLAS and the MODU Code	MSC	SSE		1	MSC 86/26, paragraph 23.39
42	2012-2013	OW (Other work)	Review of the 2009 Code on Alerts and Indicators	MSC	NCSR	SSE	2	MSC 89/25, paragraph 22.25
90	2014-2015	OW (Other work)	Amendments to the LSA Code for thermal performance of immersion suits	MSC	SSE		2	MSC 84/24, paragraph 22.48; SSE 1/21, paragraph 9.5

ANNEX 7

PROPOSED PROVISIONAL AGENDA FOR SSE 6

- Opening of the session
- 1 Adoption of the agenda
 - 2 Decisions of other IMO bodies
 - 3 Safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III (2.5)
 - 4 Develop new requirements for ventilation of survival craft (OW 47)
 - 5 Consequential work related to the new Code for ships operating in polar waters (OW 43)
 - 6 Review SOLAS chapter II-2 and associated codes to minimize the incidence and consequences of fires on ro-ro spaces and special category spaces of new and existing ro-ro passenger ships (OW 36)
 - 7 Amendments to MSC.1/Circ.1315 (OW 39)
 - 8 Amendments to chapter 9 of the FSS Code for fault isolation requirements for cargo ships and passenger ship cabin balconies fitted with individually identifiable fire detector systems (OW 27)
 - 9 Requirements for onboard lifting appliances and anchor handling winches (OW 34)
 - 10 Revised SOLAS regulations II-1/13 and II-1/13-1 and other related regulations for new ships (OW 37)
 - 11 Development of guidelines for cold ironing of ships and consideration of amendments to SOLAS chapters II-1 and II-2 (2.8)
 - 12 Unified interpretation of provisions of IMO safety, security and environment-related conventions (6.1)
 - 13 Biennial status report and provisional agenda for SSE 7
 - 14 Election of Chair and Vice-Chair for 2020
 - 15 Any other business
 - 16 Report to the Maritime Safety Committee

ANNEX 8

STATEMENTS BY DELEGATIONS

AGENDA ITEM 1

Statement by the delegation of Singapore

We thank the Secretary-General for his opening address. Singapore, as the flag Administration for the container vessel **Maersk Honam**, would like to provide a brief update to IMO Member States on the incident. The Maritime and Port Authority of Singapore (MPA) was notified of the serious fire in a cargo hold on board the **Maerk Honam** which happened last Tuesday, 6 March 2018 at about 15:00 GMT. The vessel was en route from Singapore towards Suez at around 900 nm southeast of Salalah, Oman at the time of the incident. Of the 27 crew members on board, 13 were Indian, nine Filipinos, two Thai, one British, one Romanian and one South African. 23 crew members were successfully rescued and evacuated to the nearby vessel **ALS Ceres**. Certainly one of them succumbed to his injuries and passed away. MPA was informed that the rest of the evacuated crew safely reached shore and a few of them remained in hospital to receive medical attention. MPS was also informed that the fire is now under control and that the search for the four missing crew members is still ongoing. We would like to take this opportunity to express our appreciation to the Indian Coast Guard, the Maritime Rescue Coordination Centre (MRCC) in Mumbai and the merchant vessels that came to the aid of the **Maersk Honam**. We offer our condolences to the family of the deceased and our thoughts and prayers are with the families of the missing. MPA is working with representatives from Maersk to provide support to the affected crew and their families. Singapore will be conducting an investigation into the incident with the relevant parties in accordance with the Casualty Investigation Code. Thank you.

Statement by the delegation of the Philippines

As for the previous delegation Singapore, we would like to thank Singapore for the update on the situation regarding the **Maersk Honam**. We also thank the Indian Coast Guard for its immediate assistance and to the first responders to this disaster. Of course, our condolences go to the families of the victims and if you note, the latest information says that two of the victims are Filipinos and they are cadets who are taking their onboard experience on board the ship. Mr Chair and fellow delegates, I think we start this fifth session of the SSE on quite a sad note because the incident and the equipment involved here reflect on what we are going to do this week and perhaps in the weeks to come or the succeeding session of the SSE. For this delegation, which is concerned mainly with the welfare of the seafarers, especially Filipino seafarers, we wish that the Sub-Committee and the IMO itself would look at this. We note that it is a sad start but it is also an opportunity. We are here to look at the risk of shipping and to provide a response to that risk knowing that lives are at risk and Filipino seafarers are among those in this current incident. So Mr. Chair, we would like to hope that in the investigation lessons will be learned and the Philippines will surely look into, and contribute into how it could be enhanced rather, the safety of seafarers, Filipino seafarers, and how the equipment and the systems of ships can be further enhanced to ensure that we have safe shipping and environmental-friendly ships. Thank you.