

SUB-COMMITTEE ON SHIP SYSTEMS AND
EQUIPMENT
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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), chaired by Dr. S. Ota (Japan), held its sixth session from 4 to 8 March 2019 at IMO Headquarters. The Vice-Chair of the Sub-Committee, Mr. U. Şentürk (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 6/INF.1.

Opening address

1.3 The Secretary-General welcomed participants and delivered the opening address, the full text of which can be downloaded from the IMO website at the following link:
<http://www.imo.org/en/MediaCentre/SecretaryGeneral/SpeechesByTheSecretaryGeneral>

Chair's remarks

1.4 In responding, the Chair 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

1.5 The Sub-Committee adopted the agenda (SSE 6/1) and agreed to be guided in its work, in general, by the annotations contained in document SSE 6/1/1 (Secretariat) and the arrangements set out in document SSE 6/1/2 (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 99, III 5 and MSC 100, as reported in documents SSE 6/2 and SSE 6/2/1 (Secretariat), and took them into account in its deliberations when dealing with the relevant agenda items.

Outcome of MSC 99

2.2 The Sub-Committee also noted that MSC 99 had taken the following decisions:

- .1 approved MSC.1/Circ.1500/Rev.1 on *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments* and MSC.1/Circ.1587 on *Procedural aspects related to the drafting of amendments to safety-related IMO conventions, other than the 1974 SOLAS Convention, and related mandatory instruments*, both with immediate effect;
- .2 approved the establishment of an "MSC.7" circular series, dedicated to information related to the early implementation of amendments to the 1974 SOLAS Convention and related mandatory instruments; and
- .3 approved MSC-MEPC.1/Circ.5/Rev.1 on *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies*.

Outcome of MSC 100

2.3 In regard to the outcome of MSC 100, the Sub-Committee noted that the Committee had concurred with the decision of MEPC 73 regarding measures to allow the public greater access to information and agreed that the Sub-Committee should implement the following practice:

- .1 Member States and international organizations could indicate at the time of submission whether their documents should be released to the public via IMODOCS prior to a meeting and, in the absence of such an indication, those documents would be kept private prior to the meeting of the Committees; and
- .2 notes by the Secretariat would be made publicly available via IMODOCS prior to the meeting, unless the Committees had decided otherwise in advance.

2.4 Regarding the request of MSC 100 in relation to the need for the revision of model courses falling under the purview of the SSE Sub-Committee in accordance with the *Revised guidelines for the development, review and validation of model courses* (MSC-MEPC.2/Circ.15/Rev.1), the Sub-Committee agreed to consider the matter under agenda item 17 (Any other business).

Outcome of III 5

2.5 The Sub-Committee agreed to consider the advice given by III 5, as requested by SSE 5 in relation to draft unified interpretation relating to SOLAS regulation III/20.11 contained in document SSE 5/12 (IACS), under agenda item 12 (Unified interpretation of provisions of IMO safety, security, and environment-related conventions).

Outcome of CCC 5

2.6 The Sub-Committee, as requested by CCC 5 (CCC 5/13, paragraph 3.30 and annex 1) and subsequently instructed by MSC 100 (MSC 100/20, paragraph 11.6), decided to consider the relevant parts of the draft interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel, related to fire safety issues, under agenda item 17 (Any other business).

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, as agreed by MSC 95 as part of a work plan on the development of functional requirements for SOLAS chapter III (MSC 95/22, paragraph 12.7.3), SSE 4 had endorsed the draft functional requirements and the expected performances for SOLAS chapter III for submission to MSC 98 for consideration (SSE 4/19, paragraph 3.21).

3.2 The Sub-Committee also recalled that, in considering the draft functional requirements and expected performances for SOLAS chapter III, MSC 98 had instructed the Sub-Committee to consider some principles when describing the necessary function of the draft functional requirements and expected performances in quantitative terms (MSC 98/23, paragraphs 12.13 and 12.14).

3.3 The Sub-Committee further recalled that SSE 5, having considered the matter (SSE 5/17, paragraph 3.6), agreed that:

- .1 the goals, functional requirements and expected performance criteria for SOLAS chapter III could not be separated from those for life-saving appliances covered by the LSA Code;
- .2 the primary focus of this output was the development of goals, functional requirements and expected performance criteria for the evaluation of alternative design and arrangements according to SOLAS regulation 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); and
- .3 once the Guidelines had 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 (novel life-saving appliances or arrangements).

3.4 It was noted by the Sub-Committee that in order to ensure the consistent application of SOLAS regulations III/4.3 and III/38, MSC.1/Circ.1212 and the format of the presentation of functional requirements and expected performance, SSE 5 had agreed that a gap analysis would be necessary and, therefore, re-established the Correspondence Group on Life-Saving Appliances with the terms of reference, as set out in paragraph 3.9 of document SSE 5/17, and had instructed the Group to submit a report to this session.

Report of the Correspondence Group

3.5 The Sub-Committee considered document SSE 6/3 (United States), containing the report of the Correspondence Group and, having approved it in general, noted that the Group had made progress on the draft functional requirements and expected performance criteria for SOLAS chapter III and the draft MSC circular on amendments to MSC.1/Circ.1212.

3.6 In the context of the above, the Sub-Committee also had for its consideration the following documents commenting on the Correspondence Group report:

- .1 SSE 6/3/1 (RINA), inviting the Sub-Committee to consider whether enough progress had been made to commence the revision of SOLAS chapter III, recalling that this work was one of the two items that had been agreed at MSC 98 as pre-conditions to enable the SSE Sub-Committee to commence the work on the revision of SOLAS chapter III and the LSA Code; and
- .2 SSE 6/3/2 (IACS), referring to the provisions of MSC.1/Circ.1394/Rev.1 on the *Generic Guidelines for developing goal-based standards*, highlighting concerns over the structure of the functional requirements and the need for a quantitative approach for the expected performances, and suggesting specific editorial and substantive changes with a view to improving the use of quantitative terminology and the clarity of the draft expected performances.

3.7 The Sub-Committee, having agreed to hold the consideration of document SSE 6/3/1 in abeyance pending the progress made on this agenda item during the session, noted the following comments on the report of the Correspondence Group and document SSE 6/3/2:

- .1 the Working Group on Life-Saving Appliances (LSA) should aim to clarify vague expressions such as "sufficient, as far as reasonable" for a quantitative approach;
- .2 although a hazard identification study could add value to the work as proposed in document SSE 6/3/2, the main goal of this work item was to complete the draft amendments to MSC.1/Circ.1212 firstly, based on the existing IMO instruments but not on a hazard study;
- .3 the concerns raised in document SSE 6/3/2 should be considered, in particular, that the current approach in drafting the expected performances and functional requirements was not in line with MSC.1/Circ.1394/Rev.1; and that a hazard identification study with a reverse engineering approach would prevent any gaps and, therefore, this work should further be carried on by means of a correspondence group, which should report back to SSE 7;
- .4 since the focus for this session was the finalization of the draft amendments to MSC.1/Circ.1212, the LSA Working Group should be tasked to resolve the pending issues in square brackets;
- .5 a hazard identification study approach should not be supported and priority should be given to the finalization of the quantification of the functional requirements, with the understanding that such a study could be considered in the future; and
- .6 draft amendment proposals contained in document SSE 6/3/2 would be of use when finalizing the draft amendments.

3.8 Following discussion, the Sub-Committee agreed that a hazard identification study approach would not be appropriate at the time, given that the scope of the work was to develop functional requirements based on the existing IMO instruments.

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

3.9 Having considered the above views, 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 finalize the list of functional requirements and expected performance criteria, particularly with regard to supporting the LSA Code, based on annex 1 to document SSE 6/3, taking into account document SSE 6/3/2 and the principles in paragraph 12.13 of document MSC 98/23;
- .2 finalize the draft amendments to *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212) and the associated MSC circular, based on annex 1 to document SSE 6/3, taking into account document SSE 6/3/2; and
- .3 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 LSA Working Group

3.10 Having considered the part of the report of the LSA Working Group (SSE 6/WP.3) dealing with this agenda item and document SSE 6/3/1, the Sub-Committee took action as outlined in paragraphs 3.11 to 3.13 below.

Draft revision of MSC.1/Circ.1212

3.11 In considering the draft revision of MSC.1/Circ.1212 prepared by the Group (SSE 6/WP.3, annex 1), the Sub-Committee noted a view that the expressions used in the draft amendments were non-quantitative and vague, and not in line with the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1) and that the expected performances should be developed in quantitative terms. Therefore, for a global and consistent implementation of the alternative design and arrangement provisions of SOLAS chapter III, the Sub-Committee noted the invitation for the parties using these guidelines to provide feedback to the Organization on the usefulness of these guidances in practice, with a view to ensuring a level playing field for their implementation.

3.12 Having considered the above matter, the Sub-Committee agreed to the draft revision of the *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212) and the associated MSC circular, as set out in annex 1, for submission to MSC 101 for approval, with a view to issuing the revised Guidelines as MSC.1/Circ.1212/Rev.1.

Completion of the development of functional requirements for SOLAS Chapter III

3.13 The Sub-Committee agreed that the task to develop functional requirements for SOLAS chapter III had been completed and that the functional requirements for SOLAS chapter II-1 should be developed at the next session.

Extension of the target completion year and revision of the scope of the output

3.14 In light of the above conclusion, the Sub-Committee invited the Committee to:

- .1 extend the target completion year for this output to 2020; and
- .2 approve that the scope of the output be limited to SOLAS chapter II-1, with no need to rename the output (see paragraph 3.13 above).

4 DEVELOP NEW REQUIREMENTS FOR VENTILATION OF SURVIVAL CRAFT

General

4.1 The Sub-Committee recalled that, at MSC 97, the Committee had instructed it to develop the requirements related to the ventilation of totally enclosed lifeboats as high priority and, thereafter, consider requirements for other survival craft with a view to developing amendments to the LSA Code and the *Revised recommendation on testing of life-saving appliances* (resolution MSC.81(70)) (MSC 97/22, paragraph 19.24).

4.2 The Sub-Committee also recalled that, SSE 5 had noted that CO₂ concentration should not exceed 5,000 ppm, requiring a ventilation rate of at least 5 m³/h per person and the new ventilation requirements should apply to all new-built totally enclosed lifeboats installed on board a ship after the entry-into-force date of the amendments. In this regard, SSE 5 agreed to the draft amendments to the LSA Code for eventual submission to the Committee for approval once the related amendments to the LSA Code regarding ventilation of survival craft other than totally enclosed lifeboats had been finalized (SSE 5/17, paragraph 4.10).

4.3 The Sub-Committee further recalled that MSC 100, in considering document MSC 100/9/10 (ICS et al.), expressing concerns regarding the practicalities and feasibility of the finalized ventilation requirements (including ventilation rate of 5 m³/hr per person) for totally enclosed lifeboats, had decided not to take any action in relation to the proposal contained in the document, taking into account the views that this issue had already been adequately addressed by SSE 4 and SSE 5 (MSC 100/20, paragraph 9.35).

4.4 The Sub-Committee recalled further that, at SSE 5, in order to progress the work intersessionally, the LSA Correspondence Group had been re-established with the terms of reference set out in paragraph 4.11 of document SSE 5/17 and instructed it to submit a report to this session.

Report of the Correspondence Group

General

4.5 The Sub-Committee considered the relevant part of the report of the Correspondence Group (SSE 6/3) for matters under this agenda item and, having approved it in general, noted that the Group had:

- .1 submitted two additional references for consideration regarding data on microclimates;
- .2 considered criteria for new ventilation requirements for survival craft other than totally enclosed lifeboats;
- .3 made progress regarding draft amendments to chapter IV of the LSA Code and on ventilation requirements for survival craft other than totally enclosed lifeboats; and
- .4 made progress regarding draft amendments to resolution MSC.81(70) on the *Revised recommendation on the testing of life-saving appliances* for the testing of the means of ventilation for all survival craft.

4.6 In this regard, the Sub-Committee also had for its consideration the following documents commenting on the report of the Correspondence Group regarding the development of new requirements for ventilation of survival craft:

- .1 SSE 6/4 (China), proposing amendments to the ventilation rate criteria in the LSA Code and resolution MSC.81(70), which was based on the verification of the criteria through comparison between lifeboat test and model calculation; and SSE 6/INF.3 (China), providing the results of a research conducted on lifeboat ventilation systems in order to supplement the proposal contained in document SSE 6/4, and containing an assessment which had been made as to the rationality of the required performance criteria of the ventilation rate proposed for the LSA Code and resolution MSC.81(70);
- .2 SSE 6/4/1 (Canada), proposing additional measures to supplement the draft amendments to the LSA Code on ventilation requirements of survival craft, i.e. sufficient CO₂ monitors with audible and visual alarm which would activate at a 5,000 ppm high limit, and providing amendments with regard to lifeboats; and SSE 6/INF.4 (Canada), providing information and a technical report on ventilation requirements for survival craft and supplementing the proposed additional measures in document SSE 6/4/1; and

- .3 SSE 6/4/2 (CLIA), presenting concerns on the proposal contained in document SSE 6/4/1 to amend paragraph 4.4.8 of the LSA Code for including CO₂ monitors as part of the equipment for all types of lifeboats, indicating that partially enclosed lifeboats were required to be fitted with weathertight (not watertight) enclosures, which protected occupants from exposure, while admitting sufficient air at all times (LSA Code, paragraph 4.5.2).

4.7 In considering the report of the Correspondence Group and documents SSE 6/4, SSE 6/4/1, SSE 6/4/2, SSE 6/INF.3 and SSE 6/INF.4, the Sub-Committee noted the following general comments expressed during the discussion:

- .1 document SSE 6/4/1 should be considered when revising SOLAS chapter III and the *Guidelines for the design, construction and operation of passenger submersible craft* (MSC/Circ.981), as it contained relevant provisions in relation to CO₂ concentration;
- .2 the aim of this work should be to provide a habitable environment rather than enhancing the comfort level of the occupants in a survival craft;
- .3 additional research and data was needed to justify ventilation requirements for survival craft, in particular, for partially enclosed lifeboats and liferafts;
- .4 only ventilation requirements for totally enclosed lifeboats should be considered at this stage;
- .5 the installation of CO₂ monitoring systems should be considered to ensure a safe environment in survival craft;
- .6 CO₂ monitoring systems could bring significant maintenance requirements;
- .7 increasing the proposed ventilation rate from 5 m³/h to 6.45 m³/h per person should not be considered, given the concerns raised in document MSC 100/9/10 (ICS et al.) and the conclusion reached at MSC 100 that this issue had already been adequately addressed by SSE 4 and SSE 5;
- .8 since several types and sizes of lifeboats exist, research was needed to investigate other aspects of ventilation in addition to CO₂ levels, such as the risk of asphyxiation from leaking exhaust gases and the risk of body heat loss in lower temperatures; and
- .9 increasing the ventilation rate to 6.45 m³/h per person for totally enclosed lifeboats should be taken on board during the discussions since it would increase the level of safety for the occupants.

4.8 In considering the above views, the Sub-Committee decided to prioritize the finalization of the draft amendments on the ventilation requirement for totally enclosed lifeboats. Subsequently, the Sub-Committee considered the actions requested in paragraph 26 of the report of the Correspondence Group and, having approved the report in general, took the following decisions, as set out in paragraphs 4.9 to 4.12.

Concentration threshold, ventilation criteria and draft amendments to the LSA Code

4.9 In considering the Group's views on new ventilation requirements, particularly with regard to applying the 5,000 ppm CO₂ concentration threshold and the 5m³/hr/person ventilation criteria, and the Group's discussion on draft amendments to the LSA Code, the Sub-Committee agreed to instruct the LSA Working Group to further consider the matter for totally enclosed lifeboats based on annex 1 to document SSE 5/WP.3, taking into account documents SSE 6/4, SSE 6/4/1 and the *Guidelines for the design, construction and operation of passenger submersible craft* (MSC/Circ. 981), as a matter of priority.

4.10 In regard to the Group's discussion on the draft amendments to the LSA Code, i.e. the proposed amendment to paragraph 4.1.1.5, and options and alternative text proposed for paragraph 4.5.2, the Sub-Committee agreed to instruct the LSA Working Group to further consider the draft amendments to the LSA Code on the ventilation requirement for survival craft other than totally enclosed lifeboats, taking into account documents SSE 6/3 (annex 2), SSE 6/4/1, SSE 6/4/2 and MSC/Circ.981, and advise the Sub-Committee on how best to proceed.

Ventilation requirements for survival craft

4.11 Having considered the Group's discussion and the progress made regarding the proposed amendments to resolution MSC.81(70), the Sub-Committee agreed to instruct the LSA Working Group to further consider the proposed amendments to resolution MSC.81(70).

Instructions to the LSA Working Group

4.12 Having considered the above matters, the Sub-Committee instructed the LSA Working Group, established under agenda item 3 (see paragraph 3.9), taking into account comments made and decisions taken in plenary, to:

- .1 finalize the draft amendments to the LSA Code for totally enclosed lifeboats based on annex 1 to document SSE 5/WP.3, taking into account documents SSE 6/4, SSE 6/4/1 and the *Guidelines for the design, construction and operation of passenger submersible craft* (MSC Circ. 981), as a matter of priority;
- .2 further consider draft amendments to the LSA Code on the ventilation requirement for survival craft other than totally enclosed lifeboats, taking into account annex 2 to document SSE 6/3, documents SSE 6/4/1, SSE 6/4/2 and MSC Circ. 981; and advise the Sub-Committee on how best to proceed;
- .3 further consider the proposed amendments to resolution MSC.81(70) contained in annex 3 to document SSE 6/3; and
- .4 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 LSA Working Group

4.13 Having considered the part of the report of the LSA Working Group (SSE 6/WP.3) dealing with this agenda item, the Sub-Committee took action as outlined in paragraphs 4.14 to 4.18 below.

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

4.14 In considering the decision of the Group to retain the draft amendments to the LSA Code as contained in annex 1 to document SSE 5/WP.3, the Sub-Committee noted the following views:

- .1 the decision of the Group should only be noted, as it would not be appropriate to define a prescriptive requirement on the ventilation rate without mentioning air quality or CO₂ threshold and the understanding of means of monitoring;
- .2 referring to the documents SSE 4/14, MSC 97/19/8 and MSC 97/INF.11 (Bahamas and Japan), a field calculation was conducted based on a theoretical model and although CO₂ concentration could be a performance standard for totally enclosed lifeboats, the measurement of it depended on occupants and environment at the time of testing, making it difficult to measure CO₂ concentration uniformly and, therefore, the conclusion of the Group could be endorsed;
- .3 the decision of the Group had been extensively discussed at SSE 5, MSC 100 and at this session, and therefore, the outcome of the Group should be supported; and
- .4 more discussion would be required and the proposed terms of reference ".6" for the LSA Correspondence Group to be established would allow to have more deliberations and, therefore, the decision of the Group should only be noted.

4.15 Taking into account the above views, the Sub-Committee agreed to endorse the aforementioned decision of the Group since the overwhelming majority of those that spoke on the issue was in favour of the draft amendments as contained in annex 1 to document SSE 5/WP.3.

Draft amendments to resolution MSC.81(70)

4.16 The Sub-Committee noted the progress made on the draft amendments to paragraph 6.10.1 regarding operation of engine and fuel consumption tests, and paragraph 6.14.1 regarding additional tests for totally enclosed lifeboats of the Revised recommendation on testing of LSA (resolution MSC.81(70)); and agreed to task the LSA Correspondence Group to further develop these draft amendments intersessionally, with a view to finalization at SSE 7, taking into consideration document SSE 6/4, proposing to add an additional correction factor to the ventilation rate criteria.

Draft amendments for survival craft other than totally enclosed lifeboats

4.17 The Sub-Committee noted that, owing to time constraints, the LSA Working Group had been unable to consider the draft amendments to the LSA Code on the ventilation requirement for survival craft other than totally enclosed lifeboats and, therefore, agreed to task the LSA Correspondence Group to further progress this issue with a view towards finalization at SSE 7.

Re-establishment of the LSA Correspondence Group

4.18 In order to progress the work on this output intersessionally, the Sub-Committee re-established the LSA Correspondence Group, under the coordination of the United States¹, and instructed it, taking into account comments made and decisions taken at SSE 6, to:

- .1 consider the draft amendments to resolution MSC.81(70) for the testing of the means of ventilation for totally enclosed lifeboats based on annex 2 to document SSE 6/WP.3, taking into consideration document SSE 6/4, with a view towards completion;
- .2 based on the final draft amendments, prepare the necessary consequential amendments to other IMO instruments, e.g. MSC/Circ.980;
- .3 gather and review data on the microclimate in partially enclosed lifeboats and liferafts, as available from research or academic documents or from other sources deemed reliable and relevant;
- .4 based on that review and taking into consideration, inter alia, MSC/Circ.981 and the proposed amendments to the LSA Code for totally enclosed lifeboats, identify and recommend the possible criteria for new ventilation requirements for partially enclosed lifeboats and liferafts;
- .5 prepare draft amendments to resolution MSC.81(70) for the testing of the means of ventilation for partially enclosed lifeboats and liferafts and the necessary consequential amendments to other IMO instruments;
- .6 further consider the possible benefits of air quality monitoring for all survival crafts, taking into account documents SSE 6/4/1 and SSE 6/INF.4 and advise the Sub-Committee how best to proceed; and
- .7 submit a report to SSE 7.

Extension of the target completion year

4.19 In light of the above decisions, the Sub-Committee invited the Committee to extend the target completion year for this output to 2021.

¹

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

General

5.1 The Sub-Committee recalled that MSC 97 had instructed it to review the LSA Code and the relevant IMO resolutions to adapt current testing and performance standards to the Polar Code provisions, and to develop additional requirements and guidance on extinguishing media at polar service temperatures and amendments to current standards for fire-fighters' outfits (MSC 97/22, paragraph 8.30).

5.2 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 (SSE 4/19, paragraph 15.2).

5.3 The Sub-Committee further recalled that SSE 5, having agreed that the interim guidelines on life-saving appliances and arrangements for ships operating in polar waters had to be developed as a matter of priority (SSE 5/17, paragraphs 6.15 and 6.16), had:

- .1 not been able to finalize the draft interim guidelines at that session;
- .2 noted that specific conditions, test and performance criteria for life-saving appliances and arrangements on board ships operating in polar waters could be annexed to the draft interim guidelines; and
- .3 agreed that the regulatory options to address new test and performance criteria should be decided after the finalization of the specific conditions, test and performance criteria, and the draft interim guidelines.

5.4 The Sub-Committee further recalled that SSE 5 had re-established the LSA Correspondence Group with the terms of reference set out in paragraph 6.18 of document SSE 5/17 and had instructed the Group to submit a report to this session.

Report of the Correspondence Group

5.5 The Sub-Committee considered the report of the Correspondence Group (SSE 6/5) and noted that the Group had:

- .1 made good progress on the finalization of the draft interim guidelines on life-saving appliances and arrangements for ships operating in polar waters; and
- .2 recommended that the draft interim guidelines be finalized at this session and that experience be gained in the application of the Polar Code before taking any decision on the future regulatory options.

5.6 In this context, the Sub-Committee also considered document SSE 6/5/1 (IACS), suggesting textual/editorial improvements and commenting on the report of the LSA Correspondence Group, and noted the information contained in document SSE 6/INF.2 (Norway) on the SARex 3 exercise conducted in May 2018 in Fjortendejuli Bukta.

5.7 In considering the report of the Correspondence Group and document SSE 6/5/1, the Sub-Committee noted the following views expressed:

- .1 since the industry had been keenly awaiting the guidelines as an interim measure for the life-saving appliances and arrangements for ships operating in polar waters, every effort should be made to finalize them at this session;
- .2 while the structure could be agreed upon in principle, caution should be exercised on prescriptive requirements, which should not deviate from the risk-based approach;
- .3 regulation 1.4 of part I-A (Performance standards) of the Polar Code should be applicable to the life-saving appliances and arrangements;
- .4 although polar sea conditions could be harsher than normal sea conditions, the existing requirements on food rations and fresh water in the LSA Code should not be excessively increased in the draft interim guidelines;
- .5 for the consideration of maximum expected time of rescue, the approach in the draft guidance for navigation and communication equipment intended for use on ships operating in polar waters could be taken into account, i.e. five days; and
- .6 the content on the polar survival guidance needed further clarification and this matter should be further discussed.

5.8 Taking into account the above views, the Sub-Committee considered the actions requested in paragraph 18 of the report of the Correspondence Group (SSE 6/5) and, having approved the report in general:

- .1 noted the progress made in relation to the draft interim guidelines on life-saving appliances and arrangements for ships operating in polar waters;
- .2 concurred with the understanding that chapter 8 of part I-A of the Polar Code (Life-saving appliances and arrangements) applied equally to new and existing ships, and that any differences in application would require an amendment to the Code;
- .3 agreed that the LSA Working Group should be inspected to further consider the necessity to develop guidelines on how to determine the expected time of rescue and advise the Sub-Committee;
- .4 endorsed the Correspondence Group's discussion on suitable regulatory options to address future new test and performance criteria and the recommendation that the draft interim guidelines be finalized at this session, and agreed that experience should be gained in the application of the Polar Code before taking any decision on the future regulatory options; and
- .5 agreed that the LSA Working Group should be instructed to further consider the need for development of guidelines on testing and evaluation and advise the Sub-Committee accordingly.

Instructions to the LSA Working Group

5.9 In light of the above discussions, the Sub-Committee instructed the LSA Working Group, established under agenda item 3 (see paragraph 3.9), taking into account comments made and decisions taken in plenary, to:

- .1 finalize the draft interim guidelines on life-saving appliances and arrangements for ships operating in polar waters, based on the annex to document SSE 6/5, taking into account document SSE 6/5/1;
- .2 consider options to develop guidelines on how to determine the "maximum expected time of rescue" and advise the Sub-Committee accordingly on the draft structure;
- .3 consider options on how to address the new guidelines for testing and evaluation of life-saving appliances and arrangements for ships operating in polar waters and advise the Sub-Committee accordingly; and
- .4 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 LSA Working Group

5.10 Having considered the part of the report of the LSA Working Group (SSE 6/WP.3) dealing with this agenda item, the Sub-Committee took action as outlined in paragraphs 5.11 and 5.13 below.

Draft interim guidelines on life-saving appliances and arrangements for ships operating in polar waters

5.11 In considering the draft interim guidelines on life-saving appliances and arrangements for ships operating in polar waters prepared by the Group (SSE 6/WP.3, annex 3), the Sub-Committee noted the following views:

- .1 referring to annex 1 of document SSE 6/WP.3, EP 1 under FR 8 stated that survival craft should provide a habitable environment for all persons on board that prevent exposure to a long-term CO₂ concentration of more than 5,000 ppm for at least 24 hours, and paragraph 3.7.2 of the draft interim guidelines should be harmonized with that of EP 1;
- .2 air quality monitors should be included in the list of equipment to be carried in all survival craft operating in polar waters in order to comply with the requirement in paragraph 3.7.2 of the draft interim guidelines;
- .3 if the Sub-Committee agreed to amend the text as proposed in paragraph 5.11.1 above, then "24 hours" should be replaced by "maximum expected time of rescue";
- .4 addition of an extra piece of equipment could not be agreed upon at this stage, as the LSA Working Group had not had sufficient time to discuss the matter, however, submissions could be made to MSC 101 before the approval stage; and

- .5 practice of including a carriage requirement for equipment in the draft interim guidelines should be carefully considered since it did not have any acceptance criteria or performance standard linked to it.

5.12 Following discussion, the Sub-Committee agreed to the draft interim guidelines on life-saving appliances and arrangements for ships operating in polar waters and the associated MSC circular, as contained in annex 2, for submission to MSC 101 for approval.

Guidelines on how to determine the "maximum expected time of rescue" and how to address new guidelines for testing and evaluation of life-saving appliances and arrangements

5.13 The Sub-Committee noted that, owing to time constraints, the Group had not been able to consider options to develop guidelines on how to determine the "maximum expected time of rescue" and how to address new guidelines for testing and evaluation of life-saving appliances and arrangements for ships operating in polar waters. Consequently, the Sub-Committee invited interested Member States and international organizations to submit relevant proposals to SSE 7.

Extension of the target completion year

5.14 In light of the above decisions, the Sub-Committee invited the Committee to extend the target completion year for this output to 2021.

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

General

6.1 The Sub-Committee recalled 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 (MSC 98/23, paragraph 12.42).

6.2 The Sub-Committee also recalled that SSE 5 had:

- .1 approved the list of provisionally identified IMO instruments that could need to be revised;
- .2 approved the provisional structure for the draft interim guidelines;
- .3 been unable to commence identifying and amending fire safety provisions in SOLAS chapter II-2 and associated codes;
- .4 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), which was subsequently approved by MSC 100 as a revised circular (MSC.1/Circ.1430/Rev.1); and
- .5 agreed that it was premature to request the HTW Sub-Committee to consider this issue (SSE 5/17, paragraphs 7.14 to 7.18).

6.3 The Sub-Committee further recalled that SSE 5, in considering the review of SOLAS chapter II-2 and associated codes to minimize the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships, had established the Correspondence Group on Fire Protection with the terms of reference set out in paragraph 7.21 of document SSE 5/17.

Report of the Correspondence Group

6.4 The Sub-Committee considered the report of the Correspondence Group (SSE 6/6), and, having approved it in general, noted that the Group had:

- .1 made progress on the draft interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships;
- .2 made progress on draft amendments to SOLAS regulation II-2/14.3; and
- .3 considered other related instruments that needed to be consequentially amended.

6.5 In the context of the above, the Sub-Committee also had for its consideration the following documents commenting on the report of the Correspondence Group:

- .1 SSE 6/6/3 (China), providing comments on the draft interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships, based on the lithium-ion battery fire tests conducted; and
- .2 SSE 6/6/5 (IACS), providing comments on the draft interim guidelines, specifically in relation to sections on prevention/ignition, detection and decision, extinguishment and containment.

6.6 In considering the report of the Correspondence Group together with documents SSE 6/6/3 and SSE 6/6/5, the Sub-Committee noted the following general comments expressed during the discussion:

- .1 the proposal contained in document SSE 6/6/3 to require thermographic cameras for detecting the temperature of electric vehicles powered by lithium-ion batteries during patrols in ro-ro spaces and special category spaces should be carefully considered, as such carriage requirements should be incorporated in 1974 SOLAS Convention rather than in the guidelines;
- .2 for measuring the temperature rise, the use of thermographic cameras during patrols could be a solution; and separation of vehicles powered by lithium-ion batteries should be separated from those conventional ones;
- .3 smoke extraction was not the best safety measure to take as a first step and instead, the activation of a fixed fire-extinguishing system should occur as soon as possible;
- .4 while the development of the draft interim guidelines were important and could be carried out in parallel, priority should be given to the development of the draft amendments to mandatory instruments, taking into account the possibility of entry into force in 2024 of these amendments;

- .5 separation of lithium-ion battery vehicles would not be practical, given the various types of vehicles with large battery capacities being carried; and excluding the option for onboard charging of such vehicles could compromise the existing trade practice, create difficulties in the design of ships, and, therefore, should not be considered, however, safety measures should be in place;
- .6 thermographic cameras could be considered as a solution for detection not only for lithium-ion battery vehicles but also other types of vehicles; the operation of drencher systems should be further clarified; and segregated stowage of such vehicles would not be feasible; and
- .7 amendment proposals to the STCW Code on the specification of minimum standard of competence in basic training for passenger ships should not be supported for bringing new training requirements, as enough consideration was given to training requirements under SOLAS regulations II-2/14 (Operational readiness and maintenance) and II-2/16 (Instructions, on-board training and drills) and the ISM Code; notwithstanding this, crew's onboard training and participation in drills, as well as additional requirements in the training manual could be covered under the scope of this output.

6.7 In considering the above comments and the actions requested in paragraph 126 of the report of the Correspondence Group, the Sub-Committee, having approved the report in general, decided to instruct the Working Group on Fire Protection (FP) to be established (see paragraph 6.18 below) to further develop the draft interim guidelines and the draft amendments to SOLAS and associated codes; and to further identify other related instruments which need to be consequentially amended.

Recent accident reports

6.8 With regard to recent accidents in relation to fire-safety in ro-ro spaces, the Sub-Committee had for its consideration document SSE 6/6/1 (Austria, et al.), presenting all relevant accident investigation reports and particularly safety recommendations that could be useful to the work on this agenda item, and providing relevant safety recommendations.

6.9 During the discussion, the Sub-Committee considered whether fire-fighting training should be considered by the HTW Sub-Committee and decided to hold this matter in abeyance until the draft guidelines had been finalized (see paragraph 6.20).

6.10 Following discussion, the Sub-Committee decided to further instruct the FP Working Group to consider document SSE 6/6/1 when developing the draft interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships.

FIRESAFE II study

6.11 In regard to the FIRESAFE II study, the Sub-Committee considered document SSE 6/6/2 (Austria, et al.), presenting the main topics and the structure of the FIRESAFE II study, and suggesting that the study be reviewed by the Formal Safety Assessment Experts Group (FSA EG) intersessionally and that the Group report directly to SSE 7.

6.12 Following a brief discussion, the Sub-Committee invited MSC 101 to consider re-establishing the FSA EG to review the FIRESAFE II study and to instruct SSE 7 to consider the FSA EG report and advise the Committee on how best to proceed. In this regard, the Sub-Committee noted that the FSA EG would have to conclude its report to the Committee by the 13-week deadline for SSE 7, so that Member States and international organizations could submit comments to SSE 7.

Amendments to MSC.1/Circ.1432

6.13 Concerning the testing of the fixed water-based fire-extinguishing systems, the Sub-Committee considered document SSE 6/6/4 (China), proposing amendments to the *Revised Guidelines for the maintenance and inspection of fire protection systems and appliances* (MSC.1/Circ.1432, as amended by MSC.1/Circ.1516), aimed at a more efficient testing of the fixed water-based fire-extinguishing systems mentioned in SOLAS regulation II-2/20.6.1 with flowing water test.

6.14 In considering the document SSE 6/6/4, the following views were expressed during the discussion:

- .1 practical difficulties should be taken into account for testing purposes, in particular when there was cargo on board and the testing could compromise the duration of the ship's stay in the port;
- .2 priority should be given to further development of the draft interim guidelines and the draft amendments to SOLAS and associated codes in relation to fires in ro-ro spaces and special category spaces, given the high importance of these pending matters;
- .3 even though MSC.1/Circ.1432, as amended, already touched upon this issue, the testing of fixed water-based fire-extinguishing systems should be considered;
- .4 since MSC.1/Circ.1432 already covered this requirement, further amendment should not be necessary; and
- .5 since amendments to MSC.1/Circ.1432 were considered beyond the scope of that output a new output should be proposed.

6.15 Following discussion, the Sub-Committee decided to further instruct the FP Working Group to consider the draft amendments contained in document SSE 6/6/4, if time permits; and advise the Sub-Committee on how best to proceed on this matter.

Establishment of the FP Working Group

6.16 In light of the foregoing, 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 further develop the draft interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships, based on annexes 1 and 2 to document SSE 6/6 and taking into account documents SSE 6/6/1, SSE 6/6/2, SSE 6/6/3 and SSE 6/6/5;

- .2 further develop the draft amendments to the 1974 SOLAS Convention and associated codes, based on document SSE 6/6;
- .3 further identify other related instruments which need to be consequentially amended, based on document SSE 6/6;
- .4 consider the draft amendment to the *Revised Guidelines for the maintenance and inspection of fire protection systems and appliances* (MSC.1/Circ.1432), based on document SSE 6/6/4, if time permits; and advise the Sub-Committee on how best to proceed on this matter; 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 FP Working Group

6.17 Having considered the part of the report of the FP Working Group (SSE 6/WP.4) dealing with this agenda item, the Sub-Committee took action as outlined in paragraphs 6.18 to 6.22 below.

Draft interim guidelines

6.18 The Sub-Committee noted a view that sections 2 and 3 of annex 1 to document SSE 6/WP.4 needed further consideration, and in particular, that section 3 was inconclusive concerning fitting outfits and equipment for ro-ro passenger ships and section 2 could reduce the safety concerning fire detection systems in ro-ro spaces; and, therefore, SSE 7 should further consider the matter.

6.19 Notwithstanding the above view, the Sub-Committee agreed to the draft interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships, and the associated draft MSC circular, as contained in annex 3, for submission to MSC 101 for approval.

6.20 The Sub-Committee invited the HTW Sub-Committee to consider sections 3.2 and 3.3 of the draft interim guidelines related to training and drills for seafarers at HTW 6, and advise MSC 101, as appropriate.

Draft amendments to SOLAS and other instruments

6.21 The Sub-Committee noted the view of the Group that, with regard to draft amendments to the SOLAS Convention, further consideration of the FRESAFE II report would be needed at SSE 7, particularly in light of the proposed analysis of the report by the FSA Experts Group, if established; and that draft amendments to the following mandatory and non-mandatory instruments could be required:

- .1 SOLAS chapters II-1, II-2 and III; and
- .2 *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/Rev.1).

Draft amendments to MSC.1/Circ.1432

6.22 The Sub-Committee noted the Group's consideration with regard to draft amendments to MSC.1/Circ.1432, in particular, that while agreeing in principle with the purpose of the proposed amendments to test fixed water-based fire extinguishing systems required for ro-ro passenger ships with water, these amendments should be more universally applied and thus a new output would be needed to address this matter.

Extension of the target completion year

6.23 In light of the above decisions, the Sub-Committee invited the Committee to extend the target completion year for this output to 2021.

7 AMENDMENTS TO MSC.1/CIRC.1315**General**

7.1 The Sub-Committee recalled that SSE 5, in considering 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), had 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 the recognized international standards; and
- .3 a specific fire-extinguishing capability test could be necessary within the Guidelines (SSE 5/17, paragraph 9.5).

7.2 The Sub-Committee also recalled that SSE 5 had noted that 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 (SSE 5/17, paragraph 9.8).

7.3 The Sub-Committee further recalled that SSE 5 had not been able to finalize the development of draft amendments to the Guidelines, however, noting the issues to be considered when developing the draft amendments (SSE 5/17, paragraph 9.10), had instructed the Correspondence Group on Fire Protection to further consider the matter based on the terms of reference set out in paragraph 9.11 of document SSE 5/17 and submit a report to this session.

Report of the Correspondence Group

7.4 The Sub-Committee considered the report of the Correspondence Group (SSE 6/7) and, having approved it in general, noted that the Group had:

- .1 considered the 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;

- .2 considered the draft acceptance criteria for dry chemical powders in terms of fire-extinguishing capabilities, with a view to establishing performance and testing requirements; and
- .3 elaborated on the identification of available standards and best practices relevant to the maritime sector, as well as possible gaps in the existing international regulations.

7.5 In this regard, the Sub-Committee also had for its consideration the following documents, commenting on the report of the Correspondence Group regarding draft amendments to MSC.1/Circ.1315:

- .1 SSE 6/7/1 (Japan), suggesting that dry chemical fire-extinguishing systems need not be capable of extinguishing a jet fire based on a bibliographic survey, taking into account that a jet fire should be extinguished by shutting off the supply of fuel; and
- .2 SSE 6/7/2 (IACS), proposing that draft amendments to MSC.1/Circ.1315 should, as far as practicable, take account of the principle of developing provisions based on engineering criteria, and not merely making reference to potassium-based powders; and providing comments on the testing, storage and quantities of dry chemical powders; maintenance and servicing and acceptance criteria.

7.6 In considering the report of the Correspondence Group together with documents SSE 6/7/1 and SSE 6/7/2, the Sub-Committee noted the following general comments expressed during the discussion:

- .1 certain types of dry chemical powders were considered inefficient or unsuitable for fire-fighting purposes and, therefore, potassium-based agents should be taken into account;
- .2 quantity, composition and adverse effects to human health of the chemical dry powders should further be clarified;
- .3 due to low fire-extinguishing capabilities and thermal properties causing decomposition, sodium-based dry powders should be excluded; and
- .4 jet fire testing should not be excluded from the draft amendments, as there could be instances where shutting off the valves in operation would not be sufficient, e.g. when access to the valves was not possible, and, therefore, when testing dry powders both tray fire and jet fires should be used.

7.7 Given that the majority of those who spoke supported including both jet and tray fires for testing, the Sub-Committee agreed not to refer document SSE 6/7/1 to the FP Working Group. In considering the actions requested in paragraph 35 of the report of the Correspondence Group, the Sub-Committee approved the report in general and noted the Group's discussions on:

- .1 tests of dry chemical powder;
- .2 limitation of the main components of dry chemical powder;
- .3 testing temperature for the dry powders; and
- .4 characteristics of fires to be extinguished for the fire test.

7.8 Having recalled that the implementation provision of the draft amendments had not been discussed yet, the Sub-Committee considered whether an implementation provision was necessary; and, if so, whether the draft amendments should apply to new installations only or all installations including existing ones.

7.9 Following discussion, the Sub-Committee agreed to instruct the FP Working Group to consider whether an implementation provision was necessary and, if so, to prepare draft provisions accordingly.

Instructions to the FP Working Group

7.10 Subsequently, the Sub-Committee instructed the FP Working Group, established under agenda item 6 (see paragraph 6.16), taking into account comments made and decisions taken in plenary, to:

- .1 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) with the associated draft MSC circular, based on document SSE 6/7 and taking into account document SSE 6/7/2; and
- .2 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 FP Working Group

7.11 Having considered the part of the report of the FP Working Group (SSE 6/WP.4) dealing with this agenda item, the Sub-Committee took action as outlined in paragraphs 7.12 to 7.15 below.

Draft amendments to MSC.1/Circ.1315

7.12 The Sub-Committee noted the discussion of the Group with regard to dry chemical powder and progress made with regard to the draft amendments to MSC.1/Circ.1315; and that the Group could not finalize the draft amendments due to lack of technical data with regard to the size and type of pool fire and jet fire tests.

7.13 Subsequently, the Sub-Committee agreed to re-establish a Correspondence Group on Fire Protection to identify appropriate test standards for acceptance of dry chemical powder for fixed fire-extinguishing systems, as well as to further develop the draft amendments to MSC.1/Circ.1315.

Implementation provision for the draft amendments to MSC.1/Circ.1315

7.14 The Sub-Committee, having noted that the Group could not consider the necessity of an implementation provision in the draft amendments owing to time constraints, agreed to instruct the FP Correspondence Group to consider whether an implementation provision for the draft amendments to MSC.1/Circ.1315 was necessary; and if so, to prepare draft text for such a provision.

Re-establishment of the FP Correspondence Group

7.15 Having considered the above matters and the recommendations of the FP Working Group, the Sub-Committee re-established the Correspondence Group on Fire Protection, under the coordination of the United States², and instructed it, taking into account the comments made and decisions taken at SSE 6 (SSE 6/WP.4 and SSE 6/18), to:

- .1 identify appropriate test standards for acceptance of dry chemical powder for fixed fire-extinguishing systems;
- .2 further develop the 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);
- .3 consider whether an implementation provision to the draft amendments to MSC.1/Circ.1315 is necessary; and if so, prepare the draft provision accordingly; and
- .4 submit a report to SSE 7.

Extension of the target completion year

7.16 In light of the above decisions, the Sub-Committee invited the Committee to extend the target completion year for this output to 2021.

8 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

General

8.1 The Sub-Committee recalled that MSC 98, following the consideration of document MSC 98/20/4 (Antigua and Barbuda et al.), had agreed to include a new output in the 2018-2019 biennial agenda of the Committee and the provisional agenda for SSE 6 on "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", with a target completion year of 2020 (MSC 98/23, paragraph 20.34).

8.2 In this regard, the Sub-Committee noted that this output was aimed at developing amendments to chapter 9 of the FSS Code in respect of fault isolation requirements for individually identifiable fire detector systems installed in lieu of section identifiable fire detector systems on cargo ships and passenger ship cabin balconies.

²

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Draft amendment to chapter 9 of the FSS Code

8.3 In considering the draft amendment to chapter 9 of the FSS Code as set out in annex 2 to document MSC 98/20/4, the Sub-Committee had a brief discussion on whether the draft amendments could be approved at this session. While some delegates were in favour of referring the matter to the FP Working Group or an intersessional correspondence group for further consideration, the majority of those that spoke were of the view that the issue needed further discussion due to its overarching technical nature.

8.4 Subsequently, the Sub-Committee invited interested Member States and international organizations to submit comments and proposals on the draft amendment contained in document MSC 98/20/4 to the next session.

9 REQUIREMENTS FOR ONBOARD LIFTING APPLIANCES AND ANCHOR HANDLING WINCHES**GENERAL**

9.1 The Sub-Committee recalled that SSE 5 had considered the goal- and function-based SOLAS regulations concerning onboard lifting appliances and anchor handling winches (OLAW), with a particular emphasis on types of equipment, safe working load (SWL), the scope of application, inspection and testing, training and qualification of the ship's crew and shore-based personnel, loose gear brought from the shore-side, and the draft guidelines supporting the goals and functional requirements.

9.2 The Sub-Committee also recalled that SSE 5 had:

- .1 invited MSC 100 to decide on how the scope of application of the new requirements should be specified, i.e. list of inclusions and/or exclusions (SSE 5/17, paragraph 10.9);
- .2 recognized that the SWL threshold to set the boundaries for the application of the new SOLAS regulation was linked to the discussion on the scope of application and consequently decided to consider this matter at SSE 6, taking into account the decisions at MSC 100 relating to the scope of application (SSE 5/17, paragraph 10.12); and
- .3 decided to further consider the placeholder for the draft new SOLAS regulations at a future session (SSE 5/17, paragraph 10.34).

9.3 The Sub-Committee further recalled that the OLAW Correspondence Group had been re-established with the terms of reference set out in paragraph 10.37 of document SSE 5/17 and was instructed to submit a report to this session.

9.4 In regard to the outcome of MSC 100, the Sub-Committee noted that the Committee had agreed that a "list of inclusions with some exclusions" approach should be taken when drafting the relevant SOLAS amendments in relation to OLAW; and that onboard lifting appliances installed on offshore construction ships should be excluded from the new requirements. Subsequently, the Committee instructed the Sub-Committee to further consider which lifting appliances and winches should be indicated in the draft amendments, in light of the view that the MODU Code should not be referenced, based on documents MSC 100/9/1 (Japan et al.) and MSC 100/9/5 (IMCA), as mentioned in paragraph 9.13 of document MSC 100/20.

REPORT OF THE CORRESPONDENCE GROUP

General

9.5 The Sub-Committee considered the report of the Correspondence Group on Onboard Lifting Appliances and Anchor Handling Winches (SSE 6/9) and, having approved it in general, noted the progress made on the development of the SOLAS regulations for OLAW, the additional definitions for the draft SOLAS regulations and the associated draft guidelines.

Placement of new SOLAS regulations

9.6 Before discussing the actions requested of the Sub-Committee by the Correspondence Group, the Sub-Committee considered the following documents, which would have an impact on determining the base text for further development of new draft SOLAS regulations:

- .1 SSE 6/9/1 (Japan and ICS), providing an analysis and proposals relevant to the consideration of the placeholder for the draft new SOLAS regulations for OLAW; and
- .2 SSE 6/9/2 (Japan and ICS), providing text proposals for the draft new SOLAS regulations, based on the analysis and proposals contained in document SSE 6/9/1, which were linked to documents MSC 100/9/1 and MSC 100/9/5.

Need for goal-based standards (GBS) for OLAW

9.7 In considering the above documents, the Sub-Committee noted the following views on the need for a GBS approach for OLAW:

- .1 recalling the difficulties faced by the Correspondence Group in relation to the GBS approach and despite the risk of setting a precedence for future new SOLAS regulations, the proposed SOLAS regulations with prescriptive requirements should be used to resolve the longstanding issues that needed a practical and pragmatic approach;
- .2 recalling the conclusion of MSC 100 on the experience gained in the application of the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1), it should be the prerogative of the concerned organ of the Organization to use any approach considered suitable (MSC 100/20, paragraph 6.48.3);
- .3 as initially developed, the GBS approach should be preserved, based on the report of the Correspondence Group; and
- .4 the GBS approach could prolong the completion of the work on this item and, given that OLAW related accidents continue to happen, the prescriptive approach outlined in documents SSE 6/9/1 and SSE 6/9/2 should be taken as a basis.

9.8 Following discussion, the Sub-Committee agreed to take a prescriptive approach using the annex to document SSE 6/9/2 as a basis for further drafting of the amendments.

Inclusion of a refined set of prescriptive requirements in SOLAS chapter II-1 for the OLAW which present risks

9.9 In considering where to place the new regulations, the Sub-Committee decided to include them in SOLAS chapter II-1 since the risks were related to the safety of the ship and its personnel, taking into account the decision to use a prescriptive-based approach.

Inclusion of a requirement for all OLAW and associated loose gear to be inspected and maintained, examined and tested in accordance with guidelines

9.10 The Sub-Committee had a lengthy debate regarding the proposal to include a requirement that all OLAW and associated loose gear, regardless of their SWLs and date of installation, be inspected, maintained, examined, tested and operated in accordance with guidelines to be developed, in particular, whether a specific SWL threshold, e.g. 1,000 kg, should be used.

9.11 Following discussion and taking into account the majority of delegation's views, the Sub-Committee agreed that the SWL threshold should not be used for the purposes of inspection, maintenance, examination and testing requirements and that this exclusion should be formulated by the OLAW Working Group.

Further development of the draft guidelines consistent with ILO Convention 152

9.12 In considering matters related to ILO requirements, the Sub-Committee agreed to develop the draft guidelines with a view to ensuring consistency with ILO Convention 152 in order to avoid any conflict in the implementation of the IMO guidelines.

9.13 Having discussed the proposals contained in documents SSE 6/9/1 and SSE 6/9/2, the Sub-Committee decided to instruct the OLAW Working Group to consider the above documents when developing the draft interim guidelines and draft SOLAS amendments for the safety of OLAW.

Documents commenting on the report of the Correspondence Group

9.14 The Sub-Committee also considered the following documents commenting on the report of the Correspondence Group:

- .1 SSE 6/9/3 (Canada), proposing that the application of the draft SOLAS amendments be limited to those onboard lifting appliances that were not covered by the national regulations compliant with ILO Convention 152 in order to address the issue of potential overlap among the proposed SOLAS amendments, ILO Convention 152 and the existing national regulations;
- .2 SSE 6/9/4 (Germany), proposing to make the regulation applicable as a whole to all lifting appliances regardless of their SWLs and then to define which party was responsible for compliance with the regulations below and above a certain SWL threshold; and
- .3 SSE 6/9/5 (Germany), providing the definitions of key terms to be used in the draft regulations and guidelines for OLAW to have a common understanding in order for the examinations and inspections required for different types of lifting equipment to be conducted in a uniform manner.

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

- .1 the definitions proposed in document SSE 6/9/5 should be taken into account to ensure a unified understanding of the draft regulations and guidelines for OLAW;
- .2 the concerns raised in document SSE 6/9/3 should be taken on board in order to avoid having overlapping provisions in the SOLAS Convention with that of ILO Convention 152;
- .3 in order to have a unified inspection cycle, IMO should coordinate with ILO, but OLAW related provisions should be separated from safety concerns in terms of inspections, taking into account that thorough examination should be conducted by the competent authorities;
- .4 although the existing practice was in line with the implementation of the provisions of ILO Convention 152, it should be noted that only 27 states had ratified the aforementioned Convention,
- .5 OLAW should be certified so that they could safely be inspected by the parties mentioned in document SSE 6/9/5;
- .6 the effectiveness of the SOLAS requirements could be impaired by the exclusion of lifting appliances duly certified under the national regulations of the Administration based on the provisions of the ILO Convention 152, causing inconsistent global implementation;
- .7 an SWL threshold would not be appropriate for specifying the parties responsible for compliance with the SOLAS regulations; and
- .8 the definitions proposed in document SSE 6/9/5 should be considered when developing the draft SOLAS regulation.

9.16 Taking into account the above discussion, the Sub-Committee agreed to refer documents SSE 6/9/4 and SSE 6/9/5 to the OLAW Working Group for further consideration.

Action requested by the Correspondence Group

9.17 In considering the action requested in paragraph 40 of the report of the Correspondence Group, the Sub-Committee noted the progress made on the development of the draft SOLAS regulations and the draft guidelines for OLAW, and took the following decisions.

SWL threshold

9.18 Similar to the discussion on the inclusion of an SWL for OLAW to be inspected (see paragraph 9.11), the Sub-Committee had a lengthy debate about such a threshold, in particular, whether 1,000 kg would be appropriate for the application provision of the draft SOLAS regulation II-1/3-13.

9.19 Following discussion, the Sub-Committee agreed that an SWL threshold would not be necessary for anchor handling winches. In addition, recognizing the need for various levels of safety and given the diverging views on the SWL threshold, the Sub-Committee decided to

formulate the threshold issue under an "exclusions" paragraph for enabling the differentiation among respective types of requirements, e.g. for operational or design. Subsequently, the Sub-Committee instructed the OLAW Working Group to further consider which type of equipment could be included in the exclusion paragraph, with the understanding that the SWL threshold issue would be revisited after the preparation of the whole set of requirements.

9.20 In this context, acknowledging that the provisions in the draft guidelines regarding anchor handling winches were close to finalization, whereas more work was necessary for those of lifting appliances, the Sub-Committee agreed to split the provisions into two separate guidelines.

Use of the term "thorough examination" and application of the words "this regulation"

9.21 With regard to the consideration of the use of the term "thorough examination" and the application of the words "this regulation" in the new draft SOLAS regulations, the Sub-Committee noted that it would not be necessary to consider these terms following the agreement to use the annex to document SSE 6/9/2 as the base text instead of annex 1 to document SSE 6/9 (see paragraph 9.8).

Reference to the MODU Code

9.22 With regard to the reference to the MODU Code in paragraphs 1.2 and 1.3 of the draft SOLAS regulation II-1/3-13, the Sub-Committee agreed not to refer to the MODU Code when formulating the draft SOLAS regulations, taking into account the outcome of MSC 100 (MSC 100/20, paragraph 9.13).

TYPES OF LIFTING APPLIANCES AND WINCHES TO BE INCLUDED IN THE DRAFT AMENDMENTS

9.23 The Sub-Committee, having recalled the pertinent instruction of MSC 100 (see paragraph 9.4), agreed that the discussion on the types of lifting appliances and winches to be included in the draft amendments would be relevant to the consideration of inclusion and exclusion paragraphs in the draft SOLAS regulations. Therefore, the Sub-Committee decided to instruct the OLAW Working Group to consider which lifting appliances and winches should be indicated in the draft amendments, taking into account documents MSC 100/9/1 and MSC 100/9/5.

ESTABLISHMENT OF THE OLAW WORKING GROUP

9.24 In light of the above, the Sub-Committee established the OLAW Working Group on OLAW and instructed it, taking into account the comments made and decisions taken in plenary, to:

- .1 further consider which lifting appliances and winches should be indicated in the draft amendments, based on documents MSC 100/9/1 and MSC 100/9/5;
- .2 further develop the draft SOLAS regulations for OLAW, based on the annex to document SSE 6/9/2, taking into account annex 1 to document SSE 6/9 and documents SSE 6/9/1, SSE 6/9/4 and SSE 6/9/5, with a view to finalization;

- .3 prepare the check/monitoring sheet and the record format, as contained in annexes 2 and 3 to the *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments* (MSC.1/Circ.1500/Rev.1), for the draft amendments to 1974 SOLAS Convention;
- .4 further develop the draft guidelines for the safety of onboard lifting appliances and a separate set of draft guidelines for anchor handling winches, based on annex 2 to document SSE 6/9, taking into account document SSE 6/9/5, with the associated draft MSC circular, with a view to finalization; 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 OLAW WORKING GROUP

9.25 Having considered the report of the OLAW Working Group (SSE 6/WP.5), the Sub-Committee approved the report in general and took action as outlined in paragraphs 9.27 to 9.32 below.

9.26 The Sub-Committee noted an observation that document SSE 6/9/4 had not been considered in contradiction to the terms of reference given to the OLAW Working Group.

Discussion on the draft new SOLAS regulation II-1/3-13

9.27 The Sub-Committee noted the discussion of the OLAW Working Group on the draft new SOLAS regulation II-1/3-13, in particular that:

- .1 a threshold value of 1,000 kg had been included as part of the exclusions provision;
- .2 setting a SWL threshold value for anchor handling winches had been refrained from;
- .3 no direct reference was made to the MODU Code in the draft SOLAS regulation;
- .4 offshore construction ships had been excluded from the application of the draft regulation;
- .5 the existing requirements under ILO Convention 152 should not lead to additional requirements under SOLAS for the same equipment but that the detailed explanations and clarifications should be included in the draft guidelines; and
- .6 the circumstances and conditions that would render a ship unseaworthy for inoperative OLAW had been discussed.

9.28 Subsequently, the Sub-Committee agreed, in principle, to the draft SOLAS regulation II-1/3-13, with a view to submission to the Committee in conjunction with the associated Guidelines, once finalized (see paragraph 9.30).

9.29 Notwithstanding the above, the delegation of Germany raised concerns that smaller lifting appliances, such as engine-room cranes, would remain unregulated under SOLAS.

9.30 The Sub-Committee noted that, owing to time constraints, the OLAW Working Group had been unable to prepare the check/monitoring sheet and the record format for the draft amendments to 1974 SOLAS Convention, and, therefore, agreed to re-establish the Correspondence Group on Onboard Lifting Appliances and Anchor Handling Winches and instructed it to carry out this particular task.

Draft guidelines for the safety of onboard lifting appliances and anchor handling winches

9.31 The Sub-Committee also noted that, owing to time constraints, the OLAW Working Group had been unable to consider and further develop the two sets of draft guidelines for the safety of onboard lifting appliances and anchor handling winches, respectively; and, therefore, agreed to instruct the OLAW Correspondence Group to further develop the draft guidelines.

RE-ESTABLISHMENT OF THE OLAW CORRESPONDENCE GROUP

9.32 Having considered the above matters and the recommendations of the OLAW Working Group, the Sub-Committee re-established the Correspondence Group on Onboard Lifting Appliances and Anchor Handling Winches (OLAW), under the coordination of Japan³, and instructed it, taking into account the comments made and decisions taken at SSE 6 (SSE 6/WP.5 and SSE 6/18), to:

- .1 further develop the draft guidelines for onboard lifting appliances and a separate set of draft guidelines for anchor handling winches, based on annex 2 to document SSE 6/9, taking into account documents SSE 6/9/4 and SSE 6/9/5, and prepare the associated draft MSC circular, with a view to finalization;
- .2 prepare the check/monitoring sheet and the record format, as contained in annexes 2 and 3 to the *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments* (MSC.1/Circ.1500/Rev.1), for the draft amendments to 1974 SOLAS Convention; and
- .3 submit a written report to SSE 7.

EXTENSION OF THE TARGET COMPLETION YEAR

9.33 In light of the above decisions, the Sub-Committee invited the Committee to extend the target completion year for this output to 2020.

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

General

10.1 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, as well as the ship's watertight integrity and survivability (SSE 4/19, paragraph 11.6).

10.2 The Sub-Committee also recalled that SSE 5 had invited interested delegations and international organizations to submit proposals to this session concerning safety solutions compatible with the functions of watertight doors for consideration by the Sub-Committee, with the understanding that the work on this output would be considered as completed with no action taken, if no substantive proposals had been submitted to SSE 6 (SSE 5/17, paragraph 11.5).

Completion of the work on the output

10.3 Having noted that no documents had been submitted under this agenda item and in line with the conclusion reached at SSE 5, the Sub-Committee invited the Committee to note that the work on the output had been completed.

11 DEVELOPMENT OF GUIDELINES FOR COLD IRONING OF SHIPS AND CONSIDERATION OF AMENDMENTS TO SOLAS CHAPTERS II-1 AND II-2

General

11.1 The Sub-Committee recalled that MSC 98 had agreed to include a new output on "Development of guidelines for cold ironing of ships and consideration of amendments to SOLAS chapters II-1 and II-2, if necessary" in the 2018-2019 biennial agenda and the provisional agenda for the fifth session of the Sub-Committee (MSC 98/23, paragraph 20.24).

11.2 The Sub-Committee also recalled that SSE 5, having considered the development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, had noted 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 (SSE 5/17, paragraph 13.6).

11.3 The Sub-Committee further recalled that SSE 5 had established the Correspondence Group on Development of Guidelines on Safe Operation of Onshore Power Supply Service in Port for Ships Engaged on International Voyages, with the terms of reference set out in paragraph 13.8 of document SSE 5/17, and had instructed the Group to submit a report to this session.

Report of the Correspondence Group

11.4 The Sub-Committee considered the report of the Correspondence Group (SSE 6/11) and, having approved it in general, noted that the Group had made progress on the development of draft guidelines on safe operation of onshore power supply service in port for ships engaged on international voyages and had identified some issues for further consideration, including the framework of the guidelines and making reference to international standards.

11.5 In this connection, the Sub-Committee also had for its consideration the following documents:

- .1 SSE 6/11/1 (Japan), commenting on the Correspondence Group report regarding the general requirements in the draft guidelines in relation to the development of series of standards ISO/IEC/IEEE 80005, and, in particular, raising concerns over compliance with "other recognized standards" in lieu of international standards; and
- .2 SSE 6/INF.5 (IEC), informing on the development of IEC/IEEE 80005 series, regarding utility connections in port, which had been referenced in the draft guidelines.

11.6 In considering the report of the Correspondence Group and documents SSE 6/11/1 and SSE 6/INF.5 (IEC), the Sub-Committee noted the following general comments:

- .1 the development of guidelines and consideration of the necessity of SOLAS amendments should be continued by means of a drafting group at this session;
- .2 although the development of such guidelines were considered appropriate, caution should be taken considering the lack of global implementation, practicality, interoperability and cost-effectiveness, taking into account that any measures could require substantial investment;
- .3 it was premature to task a drafting group for further developing the draft guidelines and, therefore, the work should continue to be progressed by means of a correspondence group;
- .4 standardization and operational aspects should not be mixed to avoid duplication with existing international standards and, therefore, only operational aspects should be under focus instead of developing technical requirements;
- .5 if no working slots were available at SSE 7, then an experts group could be needed at the next session to allow for an open exchange of views in order to progress the work agenda item; and
- .6 it was premature at this stage to request the HTW Sub-Committee to consider the necessity of any training requirements; however, certification and competency as per the STCW Convention should be given consideration at a later stage.

11.7 In addition, the Sub-Committee also noted the following views expressed with regard to the technical substance of the report of the Correspondence Group:

- .1 the editorial amendment proposal in document SSE 6/11/1 should be taken into account; and
- .2 paragraph 1.2.5 of the draft guidelines should carefully be considered, as an equipotential bonding would be required to all ships regardless of their types, which was beyond the requirements of standard ISO/IEC/IEEE 80005-1.

11.8 In this regard, the Sub-Committee noted a statement made by the observer from BIMCO, as set out in annex 14.

Establishment of a Drafting Group

11.9 Having considered the above documents and in view of the above discussion, the Sub-Committee agreed that the correspondence group should be re-established to further develop the draft guidelines, focusing only on operational matters. Subsequently, the Sub-Committee established the Drafting Group on Safe Operation of Onshore Power Supply and instructed it, taking into account the comments made and decisions taken in plenary, to prepare terms of reference for an intersessional correspondence group focusing only on operational matters for consideration by the Sub-Committee.

Report of the Drafting Group

11.10 Having approved the report of the Drafting Group on Safe Operation of On Shore Power Supply (OPS) (SSE 6/WP.7) in general, the Sub-Committee noted the view of the Group that the Correspondence Group should focus on developing the guidelines only at this stage.

Re-establishment of the Correspondence Group

11.11 Having considered the above matters and the recommendations of the Drafting Group on Safe Operation of OPS, the Sub-Committee re-established the Correspondence Group on the Development of guidelines on safe operation of onshore power supply service in port for ships engaged on international voyages, under the coordination of China⁴, and instructed it, taking into account the comments made and decisions taken at SSE 6, to:

- .1 further develop the draft guidelines on safe operation of onshore power supply (OPS) service in port for ships engaged on international voyages, limited to operational requirements, based on the draft text set out in the annex to document SSE 6/11, taking into account document SSE 6/11/1; and
- .2 submit a report to SSE 7.

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

General

12.1 The Sub-Committee recalled that this was 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 (UI) of provisions of IMO safety, security, and environment-related conventions, so that any newly developed or updated draft unified interpretation could be submitted for consideration by the Sub-Committee, with a view to developing an appropriate IMO interpretation.

UNIFIED INTERPRETATIONS RELATED TO FIRE SAFETY

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Requirements for two-way portable radiotelephone apparatus for fire-fighter's communication

12.2 The Sub-Committee had for its consideration document SSE 6/12/1 (IACS), proposing a draft unified interpretation of SOLAS regulation II-2/10.10.4 on the requirements for two-way portable radiotelephone apparatus for fire-fighter's communication, in particular, regarding the term "explosion-proof type or intrinsically safe", intended to specify the certified safe type and essential particulars defined in International Electrotechnical Commission (IEC) Standards.

12.3 In considering the above document, the Sub-Committee noted the following views:

- .1 the second paragraph of the proposed unified interpretation was considered to be vague and difficult to implement, in particular, the specification of hazardous area zone should be clarified;
- .2 the requirement to consider hydrogen for zone 1 hazardous areas as defined in IEC Publication 60079 would not be appropriate;
- .3 the first and second part of the proposed text referred to terminology inconsistent with IEC Publication 600079; and
- .4 "apparatus group" would need further clarification.

12.4 In light of the above views, the Sub-Committee instructed the FP Working Group to further consider the matter, if time permitted, and advise the Sub-Committee accordingly (see paragraph 12.13).

Fire detection and alarms for boilers in unattended machinery spaces

12.5 The Sub-Committee, following consideration at SSE 5 of document SSE 5/12/3 (IACS), considered document SSE 6/12/5 (IACS), providing a draft unified interpretation on fire detection and alarms for boilers in unattended machinery spaces, as required by SOLAS regulation II-1/47.1, intended to clarify the type and design of the boiler that was subject to this regulation and the location(s) within the boiler of this means of fire detection.

12.6 During the discussion, the Sub-Committee noted the following views:

- .1 the revised proposal (see paragraph 12.5) was not considered to accommodate all the fire risks in boilers and the proposals in the draft unified interpretation would necessitate amendments to the SOLAS requirements that would require a new output in order that they could be considered;
- .2 careful consideration should be given as to whether the possibility of oil collection at the inlet to the boiler after the burner had been taken into account in the proposal; and
- .3 the draft text could be interpreted as a relaxation of the regulation.

12.7 In light of the above and given the merit of technical deliberations by the subject-matter experts, the Sub-Committee instructed the FP Working Group to further consider the matter, if time permitted, and advise the Sub-Committee accordingly.

Draft unified interpretation of the footnote to SOLAS regulation II-2/9.7.5

12.8 The Sub-Committee had document SSE 6/12/8 (IACS) for its consideration, proposing a draft unified interpretation of SOLAS regulation II-2/9.7.5, as amended by resolution MSC.365(93), intended to clarify that the footnote to this regulation did not prohibit the use of fixed CO₂ fire-extinguishing systems that had not been designed or tested to ISO 15371, and the minimum quantity required for the protection of galley exhaust ducts.

12.9 In considering the above document, the Sub-Committee noted the following views:

- .1 SOLAS regulation II-2/10.6.3.1.1 was designed for paint lockers requiring CO₂ protection by 40% of the gross volume of the protected space, which was not considered enough for fixed fire-extinguishing systems for galley ducts that had a complex and long shape, preventing the distribution of CO₂ in the duct; and
- .2 100% of gross volume of the galley duct was currently used for the galley duct extinguishing systems as per NFPA standards, which could also be suggested for the purpose of that draft unified interpretation.

12.10 In view of the above, the Sub-Committee instructed the FP Working Group to further consider the matter, if time permitted, and advise the Sub-Committee accordingly.

Unified interpretations on provisions relating to inert gas systems on tankers

12.11 The Sub-Committee considered document SSE 6/12/12 (IACS), highlighting the need to clarify the requirements in paragraphs 2.2.3.2.3.3 and 2.4.1.4 of chapter 15 of the FSS Code, related to inert gas systems on tankers, providing:

- .1 IACS UI SC289 on separation arrangements between inert gas piping and cargo tanks according to paragraph 2.2.3.2.3.3 of chapter 15 of the FSS Code be also accepted for tank connections to the inert gas main (annex 1), providing clarifications regarding equivalent arrangements as allowed for in this paragraph of the Code; and
- .2 a draft unified interpretation on paragraph 2.4.1.4 of chapter 15 of the FSS Code, where nitrogen receivers or buffer tanks were located in the engine-room, in a separate compartment also containing the nitrogen generator and associated compressors, or in an enclosed space adjacent to the engine-room (annex 2).

12.12 The Sub-Committee noted that IACS members would uniformly implement UI SC289 on ships contracted for construction on or after 1 January 2020, unless they were provided with written instructions to apply a different interpretation by the Administration on whose behalf they were authorized to act as a recognized organization. The Sub-Committee, having also noted the diverging views on the proposals, including the view that the proposals did not provide an equivalent level of fire protection measures and that they could require a new output in order for them to be considered as amendments to the Code, instructed the FP Working Group to further consider the matter, if time permitted, and advise the Sub-Committee accordingly.

Instructions to the FP Working Group

12.13 Having considered the above fire protection issues, the Sub-Committee instructed the FP Working Group established under agenda item 6 (see paragraph 6.16), taking into account the comments made and decisions taken in plenary, to consider, if time permitted, the draft unified interpretations to SOLAS regulations II-1/47.1, II-2/9.7.5 and II-2/10.10.4, and to chapter 15 of the FSS Code, taking into account documents SSE 6/12/1, SSE 6/12/5, SSE 6/12/8 and SSE 6/12/12, respectively; and advise the Sub-Committee accordingly.

Report of the FP Working Group

12.14 Having considered the part of the report of the FP Working Group (SSE 6/WP.4) dealing with this agenda item, the Sub-Committee took action as outlined in paragraphs 12.15 to 12.18 below.

Draft unified interpretations to SOLAS chapter II-2

12.15 The Sub-Committee, noting the requirement for dampers in galley exhaust ducts rendered them analogous to paint locker design standards; and that SOLAS regulation II-2/10.10.4 identifies an appropriate standard for determination of the status of explosion proof and intrinsically safe fire radio, agreed to draft unified interpretations to SOLAS regulation II-2/9.7.5 concerning the appropriate use and design of CO₂ fire-extinguishing systems for galley exhaust ducts, as set out in annex 4, for submission to MSC 101 for approval (see also paragraph 12.24).

Requirements for detectors in boiler exhaust uptakes and air supply casings

12.16 With regard to the draft unified interpretation to SOLAS regulation II-1/47.1, the Sub-Committee did not agree to the draft interpretation, taking into account concerns that the suggested interpretation of requirements for detectors in boiler exhaust uptakes and air supply casings could exempt detectors in some uptakes and casings that were a fire risk and thus would constitute a relaxation of the current regulation.

Draft unified interpretations to chapter 15 of the FSS Code

12.17 Regarding the draft unified interpretation to paragraph 2.4.1.4 of chapter 15 of the FSS Code, the Sub-Committee noted a view that the draft interpretation of paragraph 2.4.1.4 of the Code went beyond the intent of the requirement and did not take any action at this stage.

12.18 The Sub-Committee did not agree to the draft interpretation of paragraph 2.2.3.2.3 of chapter 15 of the FSS Code, as it did not provide an equivalent level of safety to the provision currently found in the above-mentioned paragraph, the reason being that a shut-off valve or a metallic flexible hose did not provide the same level of isolation than a blank or a spectacle flange and, in addition, installing a vent was not a sufficient way of meeting the requirement for detecting leakages as required in the current requirement.

Application of the design temperature for piping, fittings and related components

12.19 The Sub-Committee, following consideration at SSE 5 of document SSE 5/12/8 (IACS), considered document SSE 6/12/4 (IACS), providing a draft IACS unified interpretation on the application of the design temperature for piping, fittings and related components, as required by paragraph 11.3.6 of the IGC Code which intended to bring clarity as to whether the weather deck areas above "F.O. tanks" were regarded as part of the "cargo area" and whether the piping, fittings and related components of a water-spray system in such an area were to be designed to withstand 925°C.

12.20 Following discussion, the Sub-Committee agreed to the draft unified interpretation of the IGC Code, as set out in annex 5, for submission to MSC 101 for approval (see also paragraph 12.27).

Fire integrity of the bulkheads and decks between engine-rooms and spaces in which urea or sodium hydroxide solution tanks are installed

12.21 The Sub-Committee considered document SSE 6/12/6 (IACS), providing a draft unified interpretation of SOLAS regulations II-2/3.30, II-2/9.2.2.3.2.2, II-2/9.2.2.4.2.2, II-2/9.2.3.3.2.2 and II-2/9.2.4.2.2.2 in order to clarify the required fire integrity of bulkheads between engine-rooms and spaces, in which urea or sodium hydroxide solution tanks were installed.

12.22 During the discussion, in which the proposals contained in the document were supported, the Sub-Committee noted a specific comment that SOLAS regulation II-2/9 should be thoroughly reviewed as a sustainable solution that properly took account of the design of modern ships.

12.23 The Sub-Committee agreed to further clarify the proposed unified interpretation by replacing the word "bulkhead" with "division" in the last sentence.

12.24 Following discussion, the Sub-Committee agreed to the draft unified interpretation of SOLAS chapter II-2, and the associated draft MSC circular, as set out in annex 4, for submission to MSC 101 for approval.

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

12.25 The Sub-Committee, following consideration at SSE 5 of document SSE 5/12/4 (IACS), considered document SSE 6/12/7 (IACS and SIGTTO), providing a new draft unified interpretation regarding the onboard discharge test of a dry chemical powder fire-extinguishing system, as required by paragraph 11.4.8 of the IGC Code (resolution MSC.370(93)), intended to clarify the term "sufficient amounts of dry chemical powder".

12.26 While there was general support for the draft unified interpretation in document SSE 6/12/7, the Sub-Committee noted the view that the proposed unified interpretation should be considered as an interim solution and a new output proposal to amend this paragraph of the IGC Code would be necessary for a sustainable solution. In this context, the Sub-Committee noted the request of IACS for interested Member State(s) to co-sponsor a new output proposal to a future session of the Committee, with a view to facilitating the global and consistent implementation of the mandatory requirements for dry chemical powder fire-extinguishing systems.

12.27 Consequently, the Sub-Committee agreed to the draft unified interpretation of the IGC Code and the associated draft MSC circular, as set out in annex 5, for submission to MSC 101 for approval.

Carriage of dangerous goods – required air changes

12.28 The Sub-Committee considered document SSE 6/12/10 (IACS), providing a copy of IACS UI SC288 on "Carriage of dangerous goods – Required air changes", which had been developed to facilitate the global and consistent implementation of SOLAS regulations II-2/19.3.4.1 and II-2/19.3.5.4.

12.29 Having noted that IACS members would uniformly implement UI SC288 on ships contracted for construction on or after 1 January 2020 unless they were provided with written instructions to apply a different interpretation by the Administration on whose behalf they were authorized to act as a recognized organization, the Sub-Committee, along with the views expressing support for the unified interpretation, also noted the following views:

- .1 the proposal could inadvertently change the intent of the relevant regulations and the scope of these regulations could not be altered by a unified interpretation; and
- .2 SOLAS regulation II-2/19.3.5.4 clearly referred to spaces with dedicated bilge pumps in cargo holds where there could be flammable and toxic liquids, not dangerous goods.

12.30 Consequently, the Sub-Committee did not endorse the proposed unified interpretation and invited IACS and interested delegations to note the comments made and take action, as appropriate.

Unified interpretation on provisions relating to emergency conditions due to drilling operations

12.31 The Sub-Committee considered document SSE 6/12/11 (IACS), highlighting the need to clarify the provisions of paragraph 6.5.5 of the MODU Code related to equipment that was capable of operation after shutdown, as set out in paragraph 6.5.1 of the Code, and proposing a draft unified interpretation intended to clarify whether the term "after shutdown" in paragraph 6.5.5 of the 2009 MODU Code related to any single emergency shutdown (ESD) level or to the total shutdown level of the unit.

12.32 Having noted that this unified interpretation would be uniformly implemented by IACS members on units contracted for construction from 1 January 2020 unless they were provided with written instructions to apply a different interpretation by the Administration on whose behalf they were authorized to act as a recognized organization, the Sub-Committee also noted the following views:

- .1 although the content of the proposal could be acceptable, it would not be appropriate to develop a unified interpretation for a non-mandatory instrument; and
- .2 additional consideration should be given to the proposal in order to evaluate the possible implications of such an interpretation.

12.33 In light of the above views, the Sub-Committee did not endorse the proposed unified interpretation and invited IACS and interested delegations to note the comments made and take action, as appropriate.

UNIFIED INTERPRETATIONS RELATED TO LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Requirement to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water

12.34 The Sub-Committee considered document SSE 6/12/2 (IACS), discussing the implementation of SOLAS regulation III/33.2 and paragraph 5.4 of part 2 of resolution MSC.81(70), as amended, and seeking clarification on the matter of the application of the requirement to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water.

12.35 While the Sub-Committee agreed, in general, that this requirement should not apply to free-fall lifeboats, a view was expressed that its application to the secondary means of launching should be considered. It was noted that the use of the secondary means of launching would be in an emergency situation and that this did not need to be considered in the context of this requirement. The Sub-Committee did not agree to an additional proposal made in response to these comments to deal with this issue by means of a correction to the relevant requirements.

Establishment of a Drafting Group

12.36 Given the above discussion, the Sub-Committee agreed to propose to the Committee a new output and established the Drafting Group on the Development of Justification for a New Output on "Amendments to SOLAS chapter III, the LSA Code and resolution MSC.81(70) to remove the applicability of the requirements to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water", and instructed it, taking into account the comments made and decisions taken in plenary to draft a justification for a relevant new output.

Report of the Drafting Group

12.37 Having approved the report of the Drafting Group (SSE 6/WP.8), in general, the Sub-Committee approved the draft justification for a new output on "Amendments to SOLAS chapter III, the LSA Code and the Revised resolution MSC.81(70) to remove the applicability of the requirements to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water", as set out in annex 6, for consideration by MSC 101 in accordance with the Committees' method of work (MSC-MEPC.1/Circ.5/Rev.1).

12.38 The requested output should be completed in one session, with the SSE Sub Committee as the associated organ, and be included in the biennial agenda for 2020-2021 and the provisional agenda for SSE 7.

Unified interpretation on lifebuoy arrangements for means of embarkation/disembarkation

12.39 The Sub-Committee considered document SSE 6/12/3 (IACS), proposing a draft unified interpretation on "Lifebuoy arrangements for means of embarkation/disembarkation", in the context of SOLAS regulations III/22.1.1 (lifebuoys for passenger ships), III/32.1.1 (lifebuoys for cargo ships) and SOLAS regulation II-1/3-9 (Means of embarkation and disembarkation from ships), intended to clarify that a lifebuoy fitted with both a light and a lifeline as per MSC.1/Circ.1331 on the *Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation* for compliance with SOLAS regulation II-1/3-9 should not be taken into account when considering the minimum number and distribution of lifebuoys, as required by SOLAS regulation III/22.1.1 or III/32.1.1, as applicable.

12.40 Following discussion, the Sub-Committee agreed to a draft unified interpretation of SOLAS chapter III and the associated draft MSC circular, as set out in annex 7, for submission to MSC 101, for approval (see also paragraph 12.51).

UNIFIED INTERPRETATIONS OTHER THAN THOSE FOR LIFE-SAVING APPLIANCES AND FIRE PROTECTION**Draft revision of IACS unified interpretation SC242 relating to SOLAS regulations II-1/28, II-1/29 and II-1/30**

12.41 The Sub-Committee, following consideration at SSE 4 of document SSE 4/12/10 (IACS), considered document SSE 6/12, providing a revised version of UI SC242, which offered draft unified interpretations of the relevant elements of SOLAS regulations II-1/28, II-1/29 and II-1/30.

12.42 The Sub-Committee, having agreed that the latest version of this IACS UI was considered acceptable as an interim measure, decided a new output proposal with a holistic approach encompassing all types of modern steering systems would be necessary.

12.43 Subsequently, the Sub-Committee, having concurred with the content of the draft revised version of UI SC242 and that a revised version of *Unified interpretation of SOLAS regulations II-1/28 and II-1/29* (MSC.1/Circ.1416) should be issued as a new circular, agreed to draft unified interpretations of SOLAS regulations II-1/28, II-1/29 and II-1/30 and the associated MSC circular, superseding MSC.1/Circ.1416, as set out in annex 8, for submission to MSC 101 for approval.

Clarification of SOLAS regulation II-2/13.4.2 relating to the means of escape from the steering gear space on cargo ships

12.44 In the context of SOLAS regulation II-2/13.4.2 relating to the means of escape from the steering gear space on cargo ships, the Sub-Committee had the following documents for its consideration:

- .1 SSE 6/12/14 (China), seeking clarification on the requirement of "direct access to the open deck" for the means of escape from the steering gear space containing emergency steering position in SOLAS, highlighting that inharmonious interpretations cause problems, including the detentions of the ships; and
- .2 SSE 6/12/9 (IACS), responding to the outcome of SSE 4 relating to the means of escape from the steering gear space in cargo ships according to SOLAS regulation II-2/13.4.2 and presenting a draft version (Rev.2) of IACS UI SC269, intended to clarify that, on ships having a length of less than 150 m, an escape route that passes only through stairways and/or corridors is considered as providing a "direct access to the open deck".

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

- .1 the proposed unified interpretation was not considered to be in line with the relevant SOLAS regulation and, therefore, consideration of the proposals in this draft revised unified interpretation would necessitate the Committee agreeing to a new output;
- .2 the proposal could be taken forward as an interim measure; #
- .3 even for ships of a smaller size, direct access to the open deck could easily be provided by means of a vertical access ladder and a deck hatch, thereby negating the need for this unified interpretation; and

- .4 the meaning of the relevant regulation was sufficiently clear, not requiring further interpretation.

12.46 In light of the above views, the Sub-Committee did not endorse the proposed unified interpretations and invited IACS and interested delegations to note the comments made and take action, as appropriate.

Unified interpretation on provisions relating to emergency source of electrical power on gas carriers and chemical tankers

12.47 The Sub-Committee considered document SSE 6/12/13 (IACS), providing clarification on the requirements applicable to the emergency source of electrical power on gas carriers and chemical tankers.

12.48 The Sub-Committee noted that IACS UI SC 290 only provided a reminder that there were additional provisions in the IGC or IBC Codes to the requirements in SOLAS regulation II-1/43.6 for ships to which these Codes applied.

Draft unified interpretation relating to SOLAS regulation III/20.11

12.49 The Sub-Committee recalled that SSE 5, in considering document SSE 5/12 (IACS) providing a draft unified interpretation relating to SOLAS regulation III/20.11 (UI SC144) 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, had not endorsed the proposed unified interpretation at that stage and had invited III 5 to consider said concern and advise SSE 6 accordingly (SSE 5/17, paragraphs 12.22 to 12.24).

12.50 The Sub-Committee also noted that III 5 had accordingly forwarded their views to SSE 6 (III 5/15, paragraph 8.8), which agreed to the need for the presence of a surveyor at examinations, overhauls and operational tests, carried out at intervals of at least once every five years, as per *Requirements for maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear* (resolution MSC.402(96)).

12.51 In light of the above, the Sub-Committee agreed to the draft unified interpretations of SOLAS chapter III and the associated draft MSC circular, as set out in annex 7, for submission to MSC 101 for approval.

13 AMENDMENTS TO PARAGRAPH 4.4.7.6.17 OF THE LSA CODE CONCERNING SINGLE FALL AND HOOK SYSTEMS WITH ON-LOAD RELEASE CAPABILITY

General

13.1 The Sub-Committee recalled that MSC 99, following the consideration of documents MSC 99/20/8 and MSC 99/20/8/Add.1 (Marshall Islands et al.), had agreed to include a new output in the 2018-2019 biennial agenda of the Committee and the provisional agenda for SSE 6 on "Amendments to paragraph 4.4.7.6.17 of the LSA Code concerning single fall and hook systems with on-load release capability", with a target completion year of 2019 (MSC 99/22, paragraphs 20.24 and 20.25).

13.2 The Sub-Committee also recalled that this output was aimed at bringing a uniform level of standards for single fall and hook systems to be used when launching and recovering lifeboats and rescue boats.

Draft amendment to paragraph 4.4.7.6.17 of the LSA Code

13.3 The Sub-Committee considered document SSE 6/13 (Marshall Islands et al.), recalling the discussion that had taken place at MSC 99 regarding the amendments to paragraph 4.4.7.6.17 of the LSA Code to ensure adequate safety standards for lifeboats and rescue boats fitted with single fall and hook systems with on-load release capability.

13.4 In considering the above document, the Sub-Committee, while acknowledging that several delegations supported the substance of the proposal for further consideration by the LSA Working Group, also noted concerns in relation to the applicability of these exemptions.

13.5 Consequently, the Sub-Committee agreed that further consideration of this matter was necessary and, therefore, invited the co-sponsors of document SSE 6/13 to submit a revised proposal to the next session.

Extension of the target completion year

13.6 Taking into account the above outcome, the Sub-Committee invited the Committee to extend the target completion year to 2020.

14 REVISION OF THE STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS (MSC/CIRC.980 AND ADDENDA)**General**

14.1 The Sub-Committee recalled that MSC 99, following the consideration of document MSC 99/20/10 (United States and ILAMA), had agreed to include a new output on "Revision of the Standardized life-saving appliance evaluation and test report forms (MSC/Circ.980 and addenda)", in the 2018-2019 biennial agenda of the Committee and the provisional agenda for SSE 6 with a target completion year of 2020 (MSC 99/22, paragraphs 20.27 to 20.30).

14.2 The Sub-Committee also recalled that the output was aimed to update the forms to incorporate the amendments to the LSA Code and resolution MSC.81(70), as amended, that had been approved since the *Standardized life-saving appliance evaluation and test report forms* (MSC/Circ.980) and its two addenda had been approved by MSC 73 (eight amendments to date).

14.3 In this connection, the Sub-Committee further recalled that the Committee had considered minor corrections to references to standards for material tests for inflatable liferafts and hydrostatic release unit membranes in resolution MSC.81(70), as contained in document MSC 99/20/13 (ISO); and had agreed to consider them at MSC 100 (MSC 99/22, paragraph 20.30). Consequently, MSC 100 had requested the Secretariat to prepare and submit to MSC 101 a draft MSC resolution on the adoption of amendments to the *Revised recommendation on testing of life-saving appliances* (MSC 100/20, paragraph 19.13), which has been issued as document MSC 101/14/1 (Secretariat).

14.4 The Sub-Committee recalled that the LSA Correspondence Group had stated in its report (SSE 6/3) that consideration should be given to consequential amendments to MSC/Circ.980 emanating from draft amendments on ventilation requirement for survival craft (SSE 6/3, paragraph 25).

Draft amendments to the Standardized Life-Saving Appliance Evaluation and Test Report Forms (MSC/Circ.980)

14.5 The Sub-Committee considered document SSE 6/14 (United States and ILAMA), proposing amendments to MSC/Circ.980 by incorporating the amendments to the LSA Code and the *Revised recommendation on testing of life-saving appliances* since MSC/Circ.980 and its two addenda which had been approved at MSC 73, and noted that, due to the significant size of the document, not all the annexes had been translated. In addition, the co-sponsors advised the Sub-Committee that it had received feedback (after the above document was processed) from some Member States and observers during the informal consultations, which could require additional amendments to be introduced into the proposed draft amendments.

14.6 The Sub-Committee also noted the co-sponsor's view that a more efficient framework could be developed by creating a separate MSC circular for each section of MSC/Circ.980 so that, in future, updates would be more focused in lieu of having to reissue the entire text of MSC/Circ.980 when only one section was being revised.

14.7 In light of the information from the co-sponsors, the Sub-Committee agreed that the proposed draft amendments would need to be translated into all working languages in order to complete this work at SSE 7. Subsequently, the Sub-Committee requested the co-sponsors to consult with the Secretariat on how best to process the updated text for consideration at SSE 7, with a view to ensuring that base documents were released on IMODOCS by the 13-week deadline.

15 BIENNIAL STATUS REPORT AND PROVISIONAL AGENDA FOR SSE 7

General

15.1 The Sub-Committee recalled that MSC 100 had agreed to include in the 2020-2021 biennial agenda of the SDC Sub-Committee a new output on "Development of amendments to SOLAS chapter II-1 to include requirements for water level detectors on non-bulk carrier cargo ships with multiple cargo holds", assigning the SDC Sub-Committee as the coordinating organ, in association with the SSE Sub-Committee as and when requested by the SDC Sub-Committee", with a target completion year of 2021 (MSC 100/20, paragraph 17.3).

15.2 The Sub-Committee also recalled that the Committee, having considered the following documents:

- .1 MSC 100/17/6 (Marshall Islands and RINA), proposing to examine and assess the practicality of survival craft seating arrangements as allowed under the LSA Code and to recommend suitable amendments to the Code; and
- .2 MSC 100/17/13 (ILAMA), commenting on the proposal,

had agreed that document MSC 100/17/6 should be considered by the SSE Sub-Committee in the context of its work on the post-biennial output on "Revision of SOLAS chapter III and the LSA Code", once the output had been included in its biennial agenda.

Biennial status report for the 2018-2019 biennium

15.3 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 fall under the purview of the Sub-Committee (SSE 6/WP.2, annex 1), as set out in annex 9, for consideration by MSC 101.

Proposed biennial agenda for the 2020-2021 biennium

15.4 Taking into account the progress made at the session, the Sub-Committee prepared the proposed biennial status report for the 2020-2021 biennium (SSE 6/WP.2, annex 2), as set out in annex 10, for consideration by MSC 101.

Proposed provisional agenda for SSE 7

15.5 Taking into account the progress made at the session, the Sub-Committee prepared the proposed provisional agenda for SSE 7 (SSE 6/WP.2, annex 3), as set out in annex 11, for consideration by MSC 101.

Correspondence Groups established at the session

15.6 The Sub-Committee established Correspondence Groups on the following subjects, due to report to SSE 7:

- .1 life-saving appliances (paragraph 4.18);
- .2 fire protection (paragraph 7.15);
- .3 onboard lifting appliances and anchor handling winches (paragraph 9.32);
and
- .4 cold ironing of ships (paragraph 11.11).

Arrangements for the next session

15.7 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)⁵ ;
- .2 fire protection (agenda items 6, 7 and 8)⁵ ;
- .3 onboard lifting appliances and anchor handling winches (agenda item 9)⁵;
and
- .4 revision of the *Standardized Life-Saving Appliance Evaluation and Test Report Forms* (MSC/Circ.980 and addenda) (agenda item 13)⁵,

whereby the Chair, taking into account the submissions received on the respective subjects, would advise the Sub-Committee before SSE 7 on the final selection of such groups.

⁵ Numbers refer to the agenda items contained in annex 11.

15.8 In addition to the aforementioned working and drafting groups, the Sub-Committee requested the Committee's authorization to establish at its next session an Experts' Group to deal with the following agenda items:

- .1 Safety Objectives and Functional Requirements of the Guidelines on alternative design and arrangements for SOLAS chapter II-1 (agenda item 10)⁵; and
- .2 Development of Guidelines for Cold Ironing of Ships and Consideration of Amendments to SOLAS chapters II-1 and II-2 (agenda item 11)⁵.

Date of the next session

15.9 The Sub-Committee noted that the seventh session of the Sub-Committee had been tentatively scheduled to take place from 2 to 6 March 2020.

16 ELECTION OF CHAIR AND VICE-CHAIR FOR 2020

16.1 In accordance with the Rules of Procedure of the Maritime Safety Committee, the Sub-Committee unanimously elected Mr. U. Şentürk (Turkey) as Chair and Mr. S. Tolmachev (Russian Federation) as Vice-Chair, both for 2020.

Expression of appreciation

16.2 The Sub-Committee expressed its sincere thanks and appreciation to Dr. S Ota of Japan and Mr. U. Şentürk of Turkey for their excellent services to the Sub-Committee whilst serving as its Chair and Vice-Chair, respectively.

17 ANY OTHER BUSINESS

Modification of the draft amendment to paragraph 6.1.1.3 of the LSA Code

17.1 The Sub-Committee recalled that MSC 100 had considered a proposed draft amendment to paragraph 6.1.1.3 of the LSA Code regarding manual launching of rescue boats (SSE 5/17, annex 1), together with the documents MSC 100/9/2 (Japan) and MSC 100/9/9 (IACS), and had noted some concerns with regard to the draft amendment, in particular, on the inclusion of an application date and the interpretation of the last sentence of the draft amendment in regard to the means for bringing the rescue boat against the ship's side (MSC 100/20, paragraph 9.4).

17.2 The Sub-Committee also recalled that the Committee had agreed to approve the draft amendments to the LSA Code (MSC 100/20, annex 6), with a view to adoption at MSC 101, however, had invited SSE 6 to consider the concerns raised during the discussion, with a view to advising MSC 101, as appropriate; and also had invited interested Member States and international organizations to submit relevant proposals to SSE 6, taking into account documents MSC 100/9/2 and MSC 100/9/9 (MSC 100/20, paragraph 9.5).

17.3 In this connection, the Sub-Committee considered document SSE 6/17/4 (Japan), proposing to modify the draft amendment to the LSA Code approved at MSC 100 by including an application provision, i.e. "for the rescue boats installed on or after the date of entry into force", and clarifying the interpretation of "means for bringing the rescue boat against the ship's side".

17.4 In the ensuing discussions, the majority of those that spoke were of the view that the amendment to paragraph 6.1.1.3 of the LSA Code should apply to newly installed rescue boats and the scope of application of the requirement should be clarified on the cover page of the draft resolution as opposed to in the draft amendment to the LSA Code. In relation to the meaning of the word "means", the Sub-Committee noted the view that it was clear and it did not require further clarification.

17.5 Noting the merit of the proposed editorial improvements to the draft amendments contained in paragraph 12 of document SSE 6/17/4, the Sub-Committee invited MSC 101 to consider the above comments and the proposed modifications shown below⁶ when finalizing the aforementioned draft amendments to the LSA Code for adoption:

"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; ~~provided that:~~

- .1 manual hoisting from the stowed position and turning out to the embarkation position ~~shall be~~ is possible by one person;
- .2 the force on the crank handle ~~shall~~ does not exceed 160 N at the maximum crank radius of 350 mm; and
- .3 means having sufficient strength such as bowsing line ~~shall be~~ are provided for bringing the rescue boat against the ship's side and holding it alongside so that persons can be safely embarked."

Discrepancy between chapter VI of the LSA Code and the testing provisions in resolution MSC.81(70)

17.6 The Sub-Committee, having considered document SSE 6/17/1 (IACS), highlighting an omission in the amendments to chapter VI of the LSA Code and the testing requirements in resolution MSC.81(70), as adopted at MSC 98, agreed to draft amendments to the *Revised recommendation on testing of life-saving appliances* (resolution MSC.81(70)), as set out in annex 12, for consideration by MSC 101 for approval and subsequent adoption as a minor correction in accordance with the decisions taken at C/ES.27 (C/ES.27/D, paragraph 3.2(vi)).

Draft amendments to SOLAS chapter III related to the GMDSS

17.7 The Sub-Committee considered document SSE 6/17/2 (Secretariat), providing information on the draft amendments to SOLAS chapters III and IV related to the modernization of the Global Maritime Distress and Safety System (GMDSS). During consideration, the Sub-Committee noted a view that the amendments did not include the performance standards provisions of the existing SOLAS regulation III/6.2 (Radio life-saving appliances) and the associated footnote, and that this should be dealt with by the NCSR Sub-Committee.

⁶ Proposed amendments are shown as ~~strike through~~ for deletions and as ~~shading~~ for insertions or modifications.

17.8 Subsequently, the Sub-Committee, having noted the discussion of NCSR 6 on "Coordinated plan of work for the modernization of the GMDSS" and the necessary action to be taken by that Sub-Committee (NCSR 6/23, paragraph 11.34), invited submissions with regard to any impact on the carriage requirements of radio life-saving appliances that could emanate from the provisions relocated from SOLAS chapter III to chapter IV, either to:

- .1 NCSR 7; or
- .2 the Correspondence Group on Modernization of the GMDSS established at NCSR 6; or
- .3 the Joint IMO/ITU Experts Group on Maritime radio communication matters.

Proposal to amend the *Guidelines for developing operation and maintenance manuals for lifeboat systems* (MSC.1/Circ.1205)

17.9 The Sub-Committee considered document SSE 6/17/3 (United States), proposing revisions to the *Guidelines for developing operation and maintenance manuals for lifeboat systems* (MSC.1/Circ.1205) and to add a note to SOLAS regulation III/9 in the IMO-Vega database in support of resolution A.1116(30) on *Escape route signs and equipment location markings resolution*.

17.10 Subsequently, the Sub-Committee agreed to the revision of the *Guidelines for developing operation and maintenance manuals for lifeboat systems* (MSC.1/Circ.1205) and an associated draft MSC circular, as set out in annex 13, for approval by MSC 101 as a minor correction in accordance with paragraph 3.2(vi) of document C/ES.27/D, with a view to issuing the revised guidelines as MSC.1/Circ.1205/Rev.1.

Proposal on development of a definition for gastightness in SOLAS regulation II-2/3 and gastightness test standards

17.11 The Sub-Committee considered document SSE 6/17/5 (China), noting a perceived lack of definition for "gastightness" in IMO instruments, leading to different standards in the implementation of provisions concerning gastightness, and proposing to develop a definition for gastightness in SOLAS regulation II-2/3 (Definitions) and related test standards.

17.12 The Sub-Committee noted the following views in the ensuing discussion:

- .1 the proposal should be considered by means of a new output because of its technical nature; and
- .2 such definitions existed in IEC 61892-7 and the MODU Code, which were widely used and acknowledged by the industry.

17.13 Subsequently, the Sub-Committee invited the delegation of China, and any other interested Member States and international organizations, to note the comments made, with a view to submitting a proposal for a new output to the Committee in accordance with the Committees' method of work (MSC-MEPC.1/Circ.5/Rev.1).

Proposal to review the requirements for handhold stanchion spacing of survival craft embarkation ladders in paragraph 6.1.6.1 of the LSA Code

17.14 The Sub-Committee considered document SSE 6/17/6 (China), providing an analysis of handhold stanchion spacing of survival craft embarkation ladders from the perspective of quick and safe passing through the survival craft embarkation ladders in the event of a ship's distress and proposing to review the requirements in paragraph 6.1.6.1 of the LSA Code for handhold stanchion spacing.

17.15 After consideration, the Sub-Committee invited the delegation of China to submit a proposal for a new output in accordance with the Committees' method of work (MSC-MEPC.1/Circ.5/Rev.1).

Review of systems that are required to remain operational in a casualty and methods of energy distribution for those systems

17.16 The Sub-Committee considered document SSE 6/17/7 (CESA), providing an analysis and initial review of relevant SOLAS regulations regarding systems that were required to remain operational in different emergencies, proposing a more detailed review under a new output that could lead to amendments to SOLAS or specific guidance facilitating alternative design.

17.17 In the ensuing discussion, the following views were expressed:

- .1 MSC 99 had considered this issue but had not taken any action with respect to damage stability requirements and a new proposal could be submitted to the SDC Sub-Committee under the relevant agenda item;
- .2 a hazard identification study with alternative propulsion methods could be useful for addressing the proposal; and
- .3 the SOLAS Convention did not preclude decentralized energy systems and mixing both environmental and safety aspects would not be appropriate.

17.18 In light of the above, the Sub-Committee invited interested Member States and international organizations to liaise with CESA to develop a new output proposal in accordance with the Committees' method of work (MSC-MEPC.1/Circ.5/Rev.1).

Proposal for amending MSC.1/Circ.1331 to ensure the reliability of structure, fittings and attachments of the means of embarkation and disembarkation during usage

17.19 The Sub-Committee considered document SSE 6/17/8 (China), recalling that many casualties had occurred when using means of embarkation and disembarkation due to improper design and proposing to amend the *Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation* (MSC.1/Circ.1331) to add specific provisions on the stop pins of the means of embarkation and disembarkation, with a view to ensuring the reliability of their structure, fittings and attachments during usage.

17.20 During the ensuing discussion, the following views were expressed:

- .1 the proposal could be referred to the Committee as a minor correction for further consideration; and

- .2 design and construction aspects of the accommodation ladders concerned ISO standards and, therefore, rather than amending MSC.1/Circ.1331, amendments could be made to these standards.

17.21 The Sub-Committee, having noted the above views, agreed not to take any action at this stage, however, invited interested delegations to submit a new proposal for an output in accordance with the Committees' method of work (MSC-MEPC./Circ.5/Rev.1).

17.22 In this regard, the Sub-Committee noted a statement by the delegation of the Bahamas regarding the need for a circular highlighting safety aspects of accommodation ladders, as set out in annex 14.

GISIS modules on recognized test laboratories and halon banking and reception facilities

17.23 The Sub-Committee considered document SSE 6/17 (Secretariat), providing information on the new GISIS modules for updating the list of recognized test laboratories and halon banking and reception facilities.

17.24 The Sub-Committee noted that the new GISIS modules would be tested before they were put into service and, once the modules were fully operational, revised SSE.1 circulars would be issued for the last time, along with guidance on how to use these modules. All Member States were invited to maintain their entries as and when changes occurred.

Substantive documents being considered under the agenda item on "Any other business"

17.25 The Sub-Committee, recalling that, at the last session, it had invited the Committee to note the concerns expressed regarding the proliferation of substantive documents being considered under this agenda item before such documents had been properly addressed by the Committee (SSE 5/17, paragraph 16.11), reiterated the need to take into consideration this matter when submitting documents under this agenda item to future sessions.

Model courses under the purview of IMO bodies other than the HTW Sub-Committee

17.26 The Sub-Committee recalled that MSC 100 had instructed the Sub-Committee to consider whether the following model courses would need to be revised (MSC 100/20, paragraphs 10.3) and, if that was the case, to do so in accordance with the *Revised Guidelines for the development, review and validation of model courses* (MSC-MEPC.2/Circ.15/Rev.1) at the earliest opportunity, in consultation with the Secretariat in order to streamline the process:

- .1 3.03 on Survey of machinery installations (year of publication 2004);
- .2 3.04 on Survey of electrical installations (year of publication 2004);
- .3 3.05 on Survey of fire appliances and provisions (year of publication 2004);
and
- .4 3.06 on Survey of life-saving appliances and arrangements (year of publication 2004).

17.27 The Sub-Committee also recalled that the Committee had decided to include this Sub-Committee as one of the associated organs in output 1.3 on "Validated model training courses" (MSC 100/20, paragraphs 10.3).

17.28 In this regard, the Sub-Committee noted that as per section 6 of the Revised Guidelines, the Sub-Committee could consider one of the following conclusions for the each of the above-mentioned model courses:

- .1 the model course required no update;
- .2 the model course required only minor updates, in which case depending on the volume of updates, the model course could be forwarded directly to an appropriate review group, or a drafting/validating group; or
- .3 the model course required substantial changes, in which case the model course would be considered as being a new model course for the purpose of its revision.

17.29 In noting the above, the Sub-Committee agreed that it should first determine whether the above model courses were being used by training institutes, including sales information, to determine whether or not the above courses should be maintained. In response, the Secretariat advised of its intention to submit a document to the next session indicating statistical information on the sales of the model courses in question to aid the Sub-Committee in making a decision on how best to proceed.

17.30 Consequently, the Sub-Committee invited interested Member States and international organizations to submit comments on this matter to the next session under this agenda item.

Draft interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel

17.31 The Sub-Committee recalled that, MSC 100 had endorsed the referral of relevant parts of the draft interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel to SSE 6 for consideration and advice to CCC 6, as appropriate (MSC 100/20, paragraph 11.6), and that the following parts had been referred to SSE 6 for review:

- .1 draft section 11 in its entirety; and, in particular, paragraphs 11.4.2, 11.6 and 11.7, together with the related submissions CCC 3/3 (Sweden), CCC 3/INF.22 (EC) and CCC 4/3/4 (Germany) regarding fire safety issues; and
- .2 draft section 15.9 regarding control and monitoring of fire detection systems in machinery spaces containing methyl/ethyl alcohol engines.

17.32 With regard to section 11 of the draft interim guidelines, the Sub-Committee noted the following proposed text during discussion:

- .1 paragraph 11.6.1: "Where fuel tanks were located on open deck, there should be a fixed fire-fighting system of alcohol resistant foam type. The system should be operable from a safe position. The system should fulfil the requirements in chapter 14 of the FSS Code";
- .2 paragraph 11.6.2: "The alcohol resistant foam type fire-fighting system should cover the area below the fuel tank where a large spill of fuel could be expected to spread";

.3 paragraph 11.6.3: "The bunker station should have a fixed fire-extinguishing system of alcohol resistant foam type and a portable dry chemical powder extinguisher or an equivalent extinguisher, located near the entrance of the bunkering station"; and

.4 a new paragraph 11.6.8 should be added as follows:

"11.6.8 Means to ease detection and recognition of methyl/ethyl alcohol fires in machinery spaces should be provided for fire patrols and for fire-fighting purposes."

17.33 The Sub-Committee also noted the view that possible implication of availability of foams in connection with use of perfluorooctanesulphonic acid (PFOS) and other surfactants in fire-fighting foam on board ships were still under consideration and should be taken into account by CCC 6.

17.34 After discussion, the Sub-Committee invited CCC 6 to take into account the proposed text above and also invited interested Member States and international organizations to make submissions on this matter directly to CCC 6.

Expressions of appreciation

17.35 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. Aubrey Botsford (IMO Secretariat) (on retirement)
- Mr. Greg Shark (IACS) (on retirement)
- Mr. Joseph J. Angelo (INTERTANKO) (on retirement)
- Ms. Julissa Macchiavello (Peru) (on new duties)
- Mr. Larry Fisher (United States) (on retirement)
- Dr. Stefan Micallef (IMO Secretariat) (on retirement)

18 ACTION REQUESTED OF THE COMMITTEE

18.1 The Maritime Safety Committee, at its 101st session, is invited to:

- .1 approve the draft MSC circular on Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III (MSC.1/Circ.1212), with a view to issuing the revised guidelines as MSC.1/Circ.1212/Rev.1 (paragraph 3.12 and annex 1);
- .2 note that the task to develop functional requirements for SOLAS chapter III had been completed and approve that the scope of the output be limited to SOLAS chapter II-1, without needing to re-name the output (paragraphs 3.13 and 3.14);

- .3 note the outcome and progress made on matters related to the draft amendments to the LSA Code and resolution MSC.81(70) regarding ventilation on totally enclosed lifeboats, and the draft amendments for survival craft other than totally enclosed lifeboats (paragraphs 4.14 to 4.19);
- .4 approve the draft MSC circular on Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters (paragraph 5.12 and annex 2);
- .5 consider re-establishing the FSA EG to review the FIRESAFE II study and instruct SSE 7 to consider the FSA EG report to advise the Committee on how best to proceed (paragraphs 6.11 and 6.12);
- .6 approve the draft MSC circular on Interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships (paragraph 6.19 and annex 3);
- .7 note the invitation to HTW 6 to consider the sections 3.2 and 3.3 in the draft interim guidelines related to training and drills for seafarers and advise the Committee, as appropriate (paragraph 6.20);
- .8 note the progress made on matters related to onboard lifting appliances and anchor handling winches (paragraphs 9.27 to 9.30);
- .9 approve the draft MSC circular on Unified interpretations of SOLAS chapter II-2 (paragraphs 12.15 and 12.24, and annex 4);
- .10 approve the draft MSC circular on Unified interpretations of the IGC Code (paragraphs 12.20 and 12.27, and annex 5);
- .11 consider the justification for a new output on the application of the requirement to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water, and take action, as appropriate (paragraph 12.37 and annex 6);
- .12 approve the draft MSC circular on Unified interpretations of SOLAS chapter III (paragraphs 12.40 and 12.51, and annex 7);
- .13 approve the draft MSC circular on Unified interpretations of SOLAS regulations II-1/28, II-1/29 and II-1/30 (paragraph 12.43 and annex 8);
- .14 note the biennial status report of the Sub-Committee for the 2018-2019 biennium (paragraph 15.3 and annex 9);
- .15 approve the proposed biennial agenda for the 2020-2021 biennium (paragraph 15.4 and annex 10);
- .16 approve the proposed provisional agenda for SSE 7 (paragraph 15.5 and annex 11);
- .17 authorize the Sub-Committee to establish an Experts' Group at SSE 7 to deal with issues related to cold ironing, and safety objectives and functional requirements for SOLAS chapter II-1 (paragraph 15.8);

- .18 consider the comments made and the proposed modification when finalizing the draft amendment to paragraph 6.1.1.3 of the LSA Code for adoption (paragraphs 17.4 and 17.5);
- .19 consider the draft amendments to resolution MSC.81(70), taking into account the Sub-Committee's view that the proposed amendments could be treated as minor corrections, with a view to approval and subsequent adoption, and take action, as appropriate (paragraph 17.6 and annex 12);
- .20 approve the draft MSC circular on Guidelines for developing operation and maintenance manuals for lifeboat systems (MSC.1/Circ.1205), with a view to issuing the revised guidelines as MSC.1/Circ.1205/Rev.1 (paragraph 17.10 and annex 13);
- .21 note the consideration of the Sub-Committee regarding the review of model courses under the purview of the SSE Sub-Committee (paragraphs 17.26 to 17.30);
- .22 note that the Sub-Committee forwarded its views on the relevant parts of the draft Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel to CCC 6 for consideration and action, as appropriate (paragraphs 17.32 to 17.34); and
- .23 approve the report in general.

ANNEX 1

DRAFT MSC CIRCULAR

REVISED GUIDELINES ON ALTERNATIVE DESIGN AND ARRANGEMENTS FOR SOLAS CHAPTERS II-1 AND III¹

1 The Maritime Safety Committee, at its eighty-second session (29 November to 8 December 2006), approved *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III*, ~~as set out in the annex~~, developed to provide further guidance on SOLAS regulations II-1/55 and III/38, which were adopted by resolution MSC.216(82) and ~~are expected to entered~~ into force on 1 January 2009.

2 The Guidelines serve to outline the methodology for the engineering analysis required by SOLAS regulations II-1/55 and III/38 on Alternative design and arrangements, applying to a specific engineering or life-saving system, design or arrangements for which the approval of an alternative design deviating from the prescriptive requirements of SOLAS chapters II-1 and III is sought.

3 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], approved amendments to the *Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III* (MSC.1/Circ.1212), as prepared by the Sub-Committee on Ship Systems and Equipment, at its sixth session (4 to 8 March 2019).

4 Member Governments are invited to bring the revised Guidelines, set out in the annex, to the attention of shipowners, ship builders and designers for the facilitation of design within the framework of SOLAS regulations II-1/55 and III/38.

¹ Shaded strikeouts denote deleted text and shading highlights new or amended text.

ANNEX

REVISED GUIDELINES ON ALTERNATIVE DESIGN AND ARRANGEMENTS FOR SOLAS CHAPTERS II-1 AND III²

1 Application

1.1 These Guidelines are intended for application of safe engineering design to provide technical justification for alternative design and arrangements to SOLAS chapters II-1 (parts C, D and E) and III. The Guidelines serve to outline the methodology for the engineering analysis required by Part F of SOLAS regulation II-1 and Part C of SOLAS chapter III "Alternative design and arrangements", applying to a specific safety system, design or arrangements for which the approval of an alternative design deviating from the prescriptive requirements of SOLAS chapters II-1 and III is sought.

1.2 These Guidelines are not intended to be applied to the type approval of individual materials, components or portable equipment.

1.3 These Guidelines are not intended to serve as a stand-alone document, but should be used in conjunction with the appropriate engineering design guides and other literature.

1.4 For the application of these Guidelines to be successful, all interested parties, including the Administration or its designated representative, owners, operators, designers and classification societies, should be in continuous communication from the onset of a specific proposal to utilize these Guidelines. This approach usually requires significantly more time in calculation and documentation than a typical regulatory prescribed design because of increased engineering rigor. The potential benefits include more options, cost effective designs for unique applications and an improved knowledge of loss potential.

2 Definitions

For the purposes of these Guidelines, the following definitions apply:

2.1 *Alternative design and arrangements* means measures which deviate from the prescriptive requirement(s) of SOLAS chapters II-1 or III, but are suitable to satisfy the intent of that chapter. The term includes a wide range of measures, including alternative shipboard structures and systems based on novel or unique designs, as well as traditional shipboard structures and systems that are installed in alternative arrangements or configurations.

2.2 *Design casualty* means an engineering description of the development and severity of a casualty for use in a design scenario.

2.3 *Design casualty scenario* means a set of conditions that defines the development and severity of a casualty within and through ship space(s) or systems and describes specific factors relevant to a casualty of concern.

2.4 *Functional requirements* explain, in general terms, what function the system under consideration should provide to meet the safety objectives of SOLAS.

2.5 *Performance criteria* are measurable quantities to be used to evaluate the adequacy of trial designs.

² Refer also to MSC/Circ.1002 and ~~MSC/Circ.1023~~ MSC-MEPC.2/Circ.12/Rev.2, as amended.

2.6 *Prescriptive based design or prescriptive design* means a design of safety measures which comply with the regulatory requirements set out in parts C, D and E of SOLAS chapter II-1 and/or chapter III, as applicable.

2.7 *Safety margin* means adjustments made to compensate for uncertainties in the methods and assumptions used to evaluate the alternative design, e.g. in the determination of performance criteria or in the engineering models used to assess the consequences of a casualty.

2.8 *Sensitivity analysis* means an analysis to determine the effect of changes in individual input parameters on the results of a given model or calculation method.

2.9 SOLAS means the International Convention for the Safety of Life at Sea, 1974, as amended.

3 Engineering analysis

3.1 The engineering analysis used to show that the alternative design and arrangements provide the equivalent level of safety to the prescriptive requirements of SOLAS chapters II-1 and III should follow an established approach to safety design. This approach should be based on sound science and engineering practice incorporating widely accepted methods, empirical data, calculations, correlations and computer models as contained in engineering textbooks and technical literature.

3.2 Other safety engineering approaches recognized by the Administration may be used.

4 Design team

4.1 A design team acceptable to the Administration should be established by the owner, builder or designer and may include, as the alternative design and arrangements demand, a representative of the owner, builder or designer, and expert(s) having the necessary knowledge and experience in safety, design and/or operation as necessary for the specific evaluation at hand. Other members may include marine surveyors, ship operators, safety engineers, equipment manufacturers, human factors experts, naval architects and marine engineers.

4.2 The level of expertise that individuals should have to participate in the team may vary depending on the complexity of the alternative design and arrangements for which approval is sought. Since the evaluation, regardless of complexity, will have some effect on a particular field of safety, at least one expert with knowledge and experience in that appropriate safety field should be included as a member of the team.

4.3 The design team should:

- .1 appoint a coordinator serving as the primary contact;
- .2 communicate with the Administration for advice on the acceptability of the engineering analysis of the alternative design and arrangements throughout the entire process;
- .3 determine the safety margin at the outset of the design process and review and adjust it as necessary during the analysis;

- .4 conduct a preliminary analysis to develop the conceptual design in qualitative terms. This includes a clear definition of the scope of the alternative design and arrangements and the regulations which affect the design; a clear understanding of the intent requirements of the relevant regulations; the development of appropriate casualty scenarios, if necessary, and trial alternative designs. This portion of the process is documented in the form of a report that is reviewed and agreed by all interested parties and submitted to the Administration before the quantitative portion of the analysis is started;
- .5 conduct a quantitative analysis to evaluate possible trial alternative designs using quantitative engineering analysis. This consists of the specification of design thresholds, development of performance criteria based upon the performance of an acceptable prescriptive design and evaluation of the trial alternative designs against the agreed performance criteria. From this step the final alternative design and arrangements are selected and the entire quantitative analysis is documented in a report; and
- .6 prepare documentation, specifications and a life-cycle maintenance programme. The alternative design and arrangements should be clearly documented and approved by the Administration and a comprehensive report describing the alternative design and arrangements and required maintenance programme should be kept on board the ship. An operations and maintenance manual should be developed for this purpose. The manual should include an outline of the design conditions that should be maintained over the life of the ship to ensure compliance with the approved design.

5 Preliminary analysis in qualitative terms

5.1 *Definitions of scope*

5.1.1 The ship, ship system(s), component(s), space(s) and/or equipment subject to the analysis should be thoroughly defined. This includes the ship or system(s) representing both the alternative design and arrangements and the regulatory prescribed design. Depending on the extent of the desired deviation from prescriptive requirements, some of the information that may be required includes: detailed ship plans, drawings, equipment information and drawings, test data and analysis results, ship operating characteristics and conditions of operation, operating and maintenance procedures, material properties, etc.

5.1.2 The regulations affecting the proposed alternative design and arrangements, along with their functional requirements, should be clearly understood and documented in the preliminary analysis report (see paragraph 5.5). This should form the basis for the evaluation referred to in paragraph 6.4.

5.2 *Development of casualty or operational scenarios*

Casualty or operational scenarios should provide the basis for analysis and trial alternative design evaluation and, therefore, are the backbone of the alternative design process. Proper casualty or operational scenario development is essential and, depending on the extent of deviation from the prescribed design, may require a significant amount of time and resources. This phase should outline why an alternative design may be beneficial. For life-saving arrangements, this may focus on casualty scenarios where an alternative design or arrangement will provide an equivalent (or greater) level of safety. Mechanical or electrical arrangements may focus on an operational scenario that will provide an equivalent level of safety, but may increase efficiencies or reduce cost to the operator.

5.3 Casualty scenario development

5.3.1 General

Casualty scenario development can be broken down into four areas:

- .1 identification of hazards;
- .2 enumeration of hazards;
- .3 selection of hazards; and
- .4 specification of design casualty scenarios.

5.3.2 Identification of hazards

This step is crucial in the casualty scenario development process as well as in the entire alternative design methodology. If a particular hazard or incident is omitted, then it will not be considered in the analysis and the resulting final design may be inadequate. Hazards may be identified using historical and statistical data, expert opinion and experience and hazard evaluation procedures. There are many hazard evaluation procedures available to help identify the hazards including Hazard and Operability Study (HAZOP), Process Hazard Analysis (PHA), Failure Mode and Effects Analysis (FMEA), "what-if", etc. As a minimum, the following conditions and characteristics should be identified and considered:

- .1 pre-casualty situation: ship, platform, compartment, available potential and kinetic energy, environmental conditions;
- .2 potential initiating events, causes;
- .3 detailed technical information and properties of potential hazards;
- .4 secondary hazards that might be subject to effects of initial hazard;
- .5 extension potential: beyond compartment, structure, area (if in open);
- .6 target locations: note target items or areas associated with the performance parameters;
- .7 critical factors relevant to the hazard: ventilation, environment, operational, time of day, etc.; and
- .8 relevant statistical data: past casualty history, probability of failure, frequency and severity rates, etc.

5.3.3 Enumeration of hazards

All of the hazards identified above should be grouped into one of three incident classes: localized, major or catastrophic. A localized incident consists of a casualty with a localized effect zone, limited to a specific area. A major incident consists of a casualty with a medium effect zone, limited to the boundaries of the ship. A catastrophic incident consists of a casualty with a large affect zone, beyond the ship and affecting surrounding ships or communities. In the majority of cases, only localized and/or major incidents need to be considered. Examples where the catastrophic incident class may be considered would include transport and/or

offshore production of petroleum products or other hazardous materials where the incident effect zone is very likely to be beyond the ship vicinity. The hazards should be tabulated for future selection of a certain number of each of the incident classes.

5.3.4 *Selection of hazards*

The number and type of hazards that should be selected for the quantitative analysis is dependent on the complexity of the trial alternative design and arrangements. All of the hazards identified should be reviewed for selection of a range of incidents. In determining the selection, frequency of occurrence does not need to be fully quantified, but it can be utilized in a qualitative sense. The selection process should identify a range of incidents which cover the largest and most probable range of enumerated hazards. Because the engineering evaluation relies on a comparison of the proposed alternative design and arrangements with prescriptive designs, demonstration of equivalent performance during the major incidents should adequately demonstrate the design's equivalence for all lesser incidents and provide the commensurate level of safety. In selecting the hazards it is possible to lose perspective and to begin selecting highly unlikely or inconsequential hazards. Care should be taken to select the most appropriate incidents for inclusion in the selected range of incidents.

5.3.5 *Specification of design casualty scenarios*

Based on the hazards selected, the casualty scenarios to be used in the quantitative analysis should be clearly documented. The specification should include a qualitative description of the design casualty (e.g., initiating and subsequent chain of events, location, etc.), description of the vessel, compartment or system of origin, safeguard systems installed, number of occupants, physical and mental status of occupants and available means of escape. The casualty scenarios should consider possible future changes to the hazards (increased or decreased) in the affected areas. The design casualty or casualties will be characterized in more detail during the quantitative analysis for each trial alternative design. Operational scenario development for a mechanical or electrical alternative design or arrangement should include the operating scenarios under which the alternative will be utilized.

5.4 ***Development of trial alternative designs***

At this point in the analysis, one or more trial alternative designs should be developed so that they can be compared against the developed performance criteria. The trial alternative design should also take into consideration the importance of human factors, operations and management. It should be recognized that well defined operations and management procedures may play a big part in increasing the overall level of safety.

5.5 ***Preliminary analysis report***

5.5.1 A report of the preliminary analysis should include clear documentation of all steps taken to this point, including identification of the design team, their qualifications, the scope of the alternative design analysis, the functional requirements to be met, the description of the casualty scenarios and trial alternative designs selected for the quantitative analysis.

5.5.2 The preliminary analysis report should be submitted to the Administration for formal review and agreement prior to beginning the quantitative analysis. The report may also be submitted to the port State for informational purposes, if the intended calling ports are known during the design stage. The key results of the preliminary analysis should include:

- .1 a secured agreement from all parties to the design objectives and engineering evaluation;

- .2 specified design casualty scenario(s) acceptable to all parties; and
- .3 trial alternative design(s) acceptable to all parties.

6 Quantitative analysis

6.1 General

6.1.1 The quantitative analysis is the most labour intensive from an engineering standpoint. It consists of quantifying the design casualty scenarios, developing the performance criteria, verifying the acceptability of the selected safety margins and evaluating the performance of trial alternative designs against the prescriptive performance criteria.

6.1.2 The quantification of the design casualty scenarios may include calculating the effects of casualty detection systems, alarm and mitigation methods, generating timelines from initiation of the casualty until control of the casualty or evacuation, and estimating consequences in terms of damage to the vessel, and the risk of harm to passengers and crew. This information should then be utilized to evaluate the trial alternative designs selected during the preliminary analysis.

6.1.3 Risk assessment may play an important role in this process. It should be recognized that risk cannot ever be completely eliminated. Throughout the entire performance based design process, this fact should be kept in mind. The purpose of performance design is not to build a fail safe design, but to specify a design with reasonable confidence that it will perform its intended function(s) when necessary and in a manner equivalent to or better than the prescriptive requirements of SOLAS chapters II-1 and III.

6.2 Quantification of design casualty scenarios

6.2.1 After choosing an appropriate range of incidents, quantification of the casualties should be carried out for each of the incidents. Quantification will require specification of all factors that may affect the type and extent of the hazard. The casualty scenarios should consider possible future changes to the affected systems and areas. This may include calculation of specific casualty parameters, ship damage, passenger exposure to harm, time-lines, etc. It should be noted that, when using any specific tools, the limitations and assumptions of these models should be well understood and documented. This becomes very important when deciding on and applying safety margins. Documentation of the alternative design should explicitly identify the models used in the analysis and their applicability. Reference to the literature alone should not be considered as adequate documentation. The general procedure for specifying design casualties includes casualty scenario development completed during the preliminary analysis, timeline analysis and consequence estimation which is detailed below.

6.2.2 For each of the identified hazards, a range of casualty scenarios should be developed. Because the alternative design approach is based on a comparison against the regulatory prescribed design, the quantification can often be simplified. In many cases, it may only be necessary to analyse one or two scenarios if this provides enough information to evaluate the level of safety of the alternative design and arrangements against the required prescriptive design.

6.2.3 A timeline should be developed for each of the casualty scenarios beginning with initiation. Timelines should include the entire chain of relevant events up to and including escape times (to assembly stations, evacuation stations and lifeboats, as appropriate). This timeline should include personnel response, activation of damage control systems or active

damage control measures, untenable conditions, etc. The timeline should include a description of the extent of the casualty throughout the scenario, as determined by using the various correlations, models and data from the literature or actual tests.

6.2.4 Consequences of various casualty scenarios should be quantified in relevant engineering terms. This can be accomplished by using existing correlations and calculation procedures for determining the characteristics of a casualty. In certain cases, full scale testing and experimentation may be necessary to properly predict the casualty characteristics. Regardless of the calculation procedures utilized, a sensitivity analysis should be conducted to determine the effects of the uncertainties and limitations of the input parameters.

6.3 *Development performance criteria*

6.3.1 Performance criteria are quantitative expressions of the intent of the requirements of the relevant SOLAS regulations. The required performance of the trial alternative designs are specified numerically in the form of performance criteria. Performance criteria may include tenability limits or other criteria necessary to ensure successful alternative design and arrangements.

6.3.2 Compliance with the prescriptive regulations is one way to meet the stated functional requirements. The performance criteria for the alternative design and arrangements should be determined, taking into consideration the intent of the regulations.

6.3.3 If the performance criteria for the alternative design and arrangements cannot be determined directly from the prescriptive regulations because of novel or unique features, they may be developed from an evaluation of the intended performance of a commonly used acceptable prescriptive design, provided that an equivalent level of safety is maintained. In the case of life-saving appliances and arrangements according to SOLAS chapter III, the goals, functional requirements and expected performance criteria, as set out in appendix 5, should be taken into account.

6.3.4 Before evaluating the prescriptive design, the design team should agree on what specific performance criteria and safety margins should be established. Depending on the prescriptive requirements to which the approval of alternative design or arrangements is sought, these performance criteria could fall within one or more of the following areas:

- .1 Life safety criteria – These criteria address the survivability of passengers and crew and may represent the effects of flooding, fire, etc.
- .2 Criteria for damage to ship structure and related systems – These criteria address the impact that casualty might have on the ship structure, mechanical systems, electrical systems, fire protection systems, evacuation systems, propulsion and manoeuvrability, etc. These criteria may represent physical effects of the casualty.
- .3 Criteria for damage to the environment – These criteria address the impact of the casualty on the atmosphere and marine environment.

6.3.5 The design team should consider the impact that one particular performance criterion might have on other areas that might not be specifically part of the alternative design. For example, the failure of a particular safeguard may not only affect the life safety of passengers and crew in the adjacent space, but it may result in the failure of some system affecting the overall safety of the ship.

6.3.6 Once all of the performance criteria have been established, the design team can then proceed with the evaluation of the trial alternative designs (see section 6.4).

6.4 *Evaluation of trial alternative designs*

6.4.1 All of the data and information generated during the preliminary analysis and specification of design casualty should serve as input to the evaluation process. The evaluation process may differ depending on the level of evaluation necessary (based on the scope defined during the preliminary analysis), but should generally follow the process illustrated in figure 6.4.1.

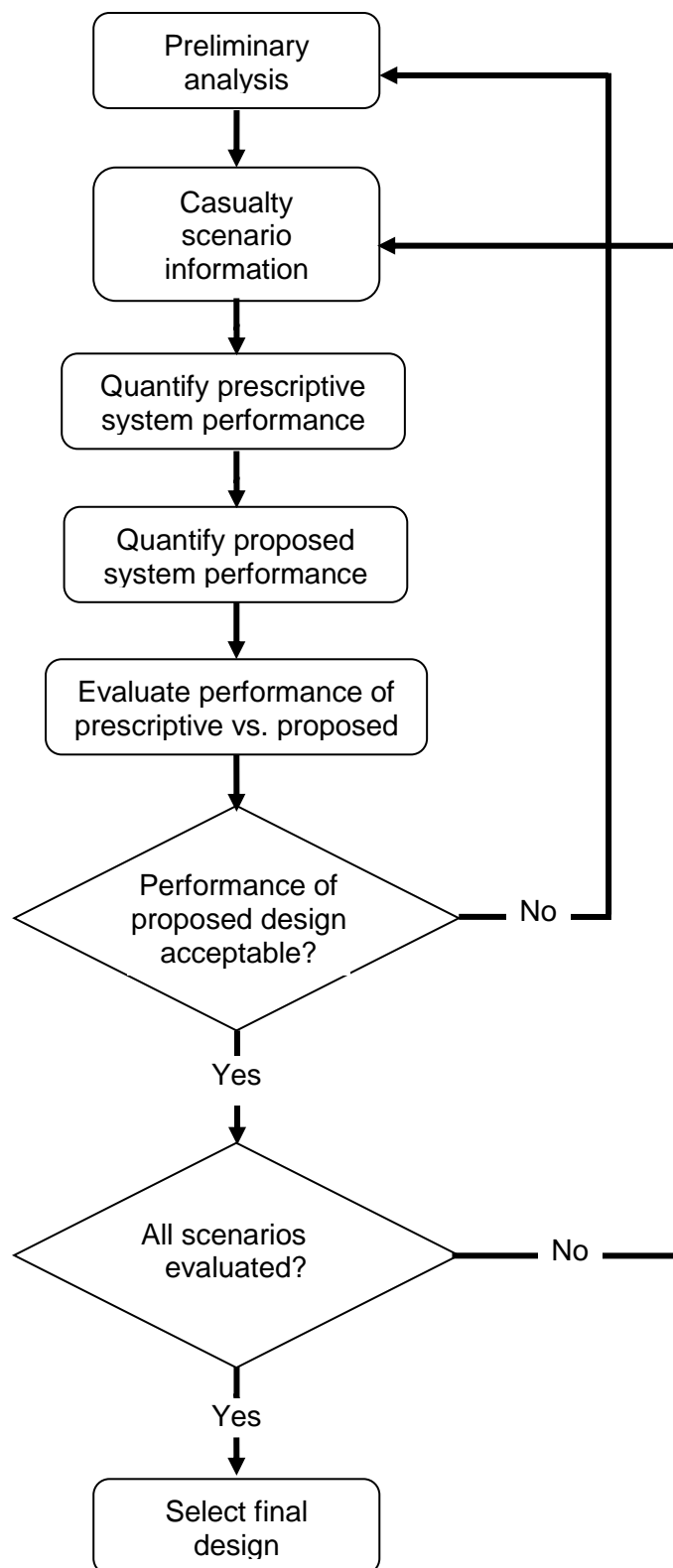


Figure 6.4.1 *Alternative design and arrangements process flowchart*

6.4.2 Each selected trial alternative design should be analysed against the selected design casualty scenarios to demonstrate that it meets the performance criteria with the agreed safety margin, which in turn demonstrates equivalence to the prescriptive design.

6.4.3 The level of engineering rigor required in any particular analysis will depend on the level of analysis required to demonstrate equivalency of the proposed alternative design and arrangements to the prescriptive requirements. Obviously, the more components, systems, operations and parts of the ship that are affected by a particular alternative design, the larger the scope of the analysis.

6.4.4 The final alternative design and arrangements should be selected from the trial alternative designs that meet the selected performance criteria and safety margins.

7 Documentation

7.1 Because the alternative design process may involve substantial deviation from the regulatory prescribed requirements, the process should be thoroughly documented. This provides a record that will be required if future design changes to the ship are proposed or the ship transfers to the flag of another State and will also provide details and information that may be adapted for use in future designs. The following information should be provided for approval of the alternative design or arrangements:

- .1 scope of the analysis or design;
- .2 description of the alternative design(s) or arrangements(s), including drawings and specifications;
- .3 results of the preliminary analysis, to include:
 - .3.1 members of the design team (including qualifications);
 - .3.2 description of the trial alternative design and arrangements being evaluated;
 - .3.3 discussion of affected SOLAS regulations and their requirements;
 - .3.4 hazard identification;
 - .3.5 enumeration of hazards;
 - .3.6 selection of hazards; and
 - .3.7 description of design casualty scenarios;
- .4 results of quantitative analysis:
 - .4.1 design casualty scenarios:
 - .4.1.1 critical assumptions;
 - .4.1.2 initial conditions;
 - .4.1.3 engineering judgements;

- .4.1.4 calculation procedures;
- .4.1.5 test data;
- .4.1.6 sensitivity analysis; and
- .4.1.7 timelines;
- .4.2 performance criteria;
- .4.3 evaluation of trial alternative designs against performance criteria;
- .4.4 description of final alternative design and arrangements;
- .4.5 test, inspection and maintenance requirements; and
- .4.6 references.

7.2 Documentation of approval by the Administration and the following information should be maintained onboard the ship at all times:

- .1 scope of the analysis or design, including the critical design assumptions and critical design features;
- .2 description of the alternative design and arrangements, including drawings and specifications;
- .3 listing of affected SOLAS regulations;
- .4 summary of the results of the engineering analysis and basis for approval; and
- .5 test, inspection and maintenance requirements.

7.3 *Reporting and approval forms*

7.3.1 When the Administration approves alternative design and arrangements under these guidelines, pertinent technical information about the approval should be summarized on the reporting form given in appendixes 1 or 2, as appropriate, and should be submitted to the Organization for circulation to the Member Governments.

7.3.2 When the Administration approves alternative design and arrangements under these guidelines, documentation should be provided as indicated in appendixes 3 or 4, as appropriate. The documentation should be in the language or languages required by the Administration. If the language is neither English, French or Spanish, a translation into one of those languages should be included.

APPENDIX 1

REPORT ON THE APPROVAL OF ALTERNATIVE DESIGN AND ARRANGEMENTS FOR MACHINERY AND ELECTRICAL INSTALLATIONS

The Government of has approved on an alternative design and arrangement in accordance with provisions of regulation II-1/55 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, as described below:

Name of ship
Port of registry
Ship type
IMO Number

1. Scope of the analysis or design, including the critical design assumptions and critical design features:
2. Description of the alternative design and arrangements:
3. Conditions of approval, if any:
4. Listing of affected SOLAS chapter II-1 regulations in parts C, D and E:
5. Summary of the result of the engineering analysis and basis for approval, including performance criteria and design casualty scenarios:
6. Test, inspection and maintenance requirements:

APPENDIX 2

REPORT ON THE APPROVAL OF ALTERNATIVE DESIGN AND ARRANGEMENTS FOR LIFE-SAVING APPLIANCES AND ARRANGEMENTS

The Government of has approved on an alternative design and arrangement in accordance with provisions of regulation III/38 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, as described below:

Name of ship
Port of registry
Ship type
IMO Number

1. Scope of the analysis or design, including the critical design assumptions and critical design features:
2. Description of the alternative design and arrangements:
3. Conditions of approval, if any:
4. Listing of affected SOLAS chapter III regulations:
5. Summary of the result of the engineering analysis and basis for approval, including performance criteria and design casualty scenarios:
6. Test, inspection and maintenance requirements:

APPENDIX 3

DOCUMENT OF APPROVAL OF ALTERNATIVE DESIGN AND ARRANGEMENTS FOR MACHINERY AND ELECTRICAL INSTALLATIONS

Issued in accordance with provisions of regulation II-1/55.4 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, under the authority of the Government of by

.....

(Name of State)

(Person or organization authorized)

Name of ship

Port of registry

Ship type

IMO Number

THIS IS TO CERTIFY that the following alternative design and arrangements applied to the above ship have been approved under the provisions of SOLAS regulation II-1/55:

1. Scope of the analysis or design, including the critical design assumptions and critical design features:
2. Description of the alternative design and arrangements:
3. Conditions of approval, if any:
4. Listing of affected SOLAS chapter II-1 regulations:
5. Summary of the result of the engineering analysis and basis for approval, including performance criteria and design casualty scenarios:
6. Test, inspection and maintenance requirements:
7. Drawings and specifications of the alternative design and arrangement:

Issued at on

.....
(Signature of authorized official
issuing the certificate)

(Seal or stamp of issuing authority, as appropriate)

APPENDIX 4

DOCUMENT OF APPROVAL OF ALTERNATIVE DESIGN AND ARRANGEMENTS FOR LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Issued in accordance with provisions of regulation III/38.4 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended, under the authority of the Government of by

.....

(Name of State)

(Person or organization authorized)

Name of ship

Port of registry

Ship type

IMO Number

THIS IS TO CERTIFY that the following alternative design and arrangements applied to the above ship have been approved under the provisions of SOLAS regulation III/38.

1. Scope of the analysis or design, including the critical design assumptions and critical design features:
2. Description of the alternative design and arrangements:
3. Conditions of approval, if any:
4. Listing of affected SOLAS chapter III regulations:
5. Summary of the result of the engineering analysis and basis for approval, including performance criteria and design casualty scenarios:
6. Test, inspection and maintenance requirements:
7. Drawings and specifications of the alternative design and arrangement:

Issued at on

.....
(Signature of authorized official
issuing the certificate)

(Seal or stamp of issuing authority, as appropriate)

APPENDIX 5

GOALS, FUNCTIONAL REQUIREMENTS AND EXPECTED PERFORMANCE CRITERIA FOR SOLAS CHAPTER III

Goal: To save and maintain human life during and after an emergency situation

FR 1: All life-saving appliances should be in a state of readiness for immediate use. This will be accomplished by ensuring:

- EP 1: All life-saving appliances should be easily accessible (e.g. not obstructed and not locked).
- EP 2: All life-saving appliances should be stowed securely in a sheltered position and protected from damage by fire and explosion.
- EP 3: All life-saving appliances should be maintainable to ensure reliability for the specified service cycle.
- EP 4: All life-saving appliances should be designed considering uncertainty in material properties, loads, deterioration and consequences of failure in operating environment.
- EP 5: Descriptions and instructions for operation, inspection, maintenance and functional testing should be provided for all life-saving appliances.
- EP 6: All life-saving appliances should be able to withstand environmental exposure of the ship including sunlight, ozone, seawater (wash, heavy seas), icing, wind, humidity, oil, air temperature (-30°C to +65°C), water temperature (at least -1°C to +30°C if it is likely to be immersed in seawater), fungus and marine atmosphere.
- EP 7: All life-saving appliances should be usable and operational under adverse vessel conditions, i.e. list and trim.
- EP 8: Deployment of life-saving appliances should be possible without depending upon any means other than gravity or stored power which is independent of the ship's power supplies to launch the survival craft.
- EP 9: The number of crew members on board should be sufficient for operating the life-saving appliance and launching arrangements required for abandonment by the total number of persons on board. This should include substitutes for key persons and crew members on board operating survival craft and launching arrangements are assigned and trained appropriately.

FR 2: Training and drills should be sufficient to ensure that all passengers and crew are familiar with their responsibilities in an emergency. This will be accomplished by ensuring:

- EP 1: All life-saving appliances and arrangements should be designed and installed to facilitate training and drills.

EP 2: Training and drills should be routinely conducted to ensure crew are in a state of readiness and are competent with the operation of life-saving appliances and their assigned emergency duties.

EP 3: Every crew member should participate in drills. These should be conducted, as far as practicable, as if there were an actual emergency.

EP 4: Drills should be planned and conducted in a safe manner.

EP 5: Drills should be planned in such a way that due consideration is given to regular practice in the various emergencies that may occur depending on the type of ship and cargo.

FR 3: Before proceeding to sea, all crew and passengers should be provided with information and instructions of the actions to be taken in an emergency. This will be accomplished by ensuring:

EP 1: Safety information and instructions should be presented in a manner that is easily understood by passengers, in language, illustration and/or demonstration.

EP 2: Information should be distributed and displayed in appropriate conspicuous places accessible under all conditions, e.g. emergency lighting.

EP 3: All ships should clearly indicate and highlight the stowage location of all life-saving appliances, display directions to places designated for assembling all persons in the event of an emergency, display assignment to life-saving appliances and display how to operate life-saving appliances.

EP 4: The number and type of life-saving appliances should be marked at each stowage location.

FR 4: All ships should have an effective emergency management system. A copy of the emergency management system should be readily available to crew. This will be accomplished by ensuring:

EP 1: The emergency management system should clearly identify roles and responsibilities during an emergency.

EP 2: Assembly locations, muster stations and escape routes should be identified on all ships.

EP 3: All passenger ships should establish a decision support system.

EP 4: The emergency management system should include the consideration of physical characteristics and capabilities of embarked persons.

EP 5: All ships should have the means to account for all persons on board.

EP 6: The emergency management system should have a uniform structure, be easy to use and be provided on board in an appropriate conspicuous location.

FR 5: All ships should be provided with means of external communications with shore, ships and aircraft. This will be accomplished by ensuring:

- EP 1: All ships should have the means to indicate their position visually in an emergency, which makes it possible to detect and locate the ship from an altitude of at least 3,000 m at a range of at least 10 miles under clear daytime and night-time conditions for a period of at least 40 s.
- EP 2: All ships should be provided with means for two-way on-scene communication between survival craft, between survival craft and ship, and between survival craft and rescue craft.
- EP 3: All ships should carry search and rescue locating devices that are designed to automatically activate and operate continuously and can be rapidly placed into any survival craft from their place of storage on the ship.

FR 6: All ships should be able to internally communicate emergency messages and instructions to all crew and passengers. This will be accomplished by ensuring:

- EP 1: Emergency alerts, messages and instructions to all crew and passengers should be received regardless of an individual's location on the ship.
- EP 2: Emergency alerts, messages and instructions should be communicated in appropriate languages expected to be understood by all those on board.
- EP 3: Two-way communications should be possible between emergency control stations, places designated for assembling and/or embarkation to survival craft and strategic positions on board.

FR 7: All ships should provide means for a safe abandonment for all persons. This will be accomplished by ensuring:

- EP 1: Means should be available to embark survival craft from both the embarkation deck and the waterline in the lightest seagoing condition and under adverse conditions of list and trim.
- EP 2: Means of evacuation should be distributed on the ship considering access of persons and areas where persons may become isolated.
- EP 3: Each davit-launched, self-propelled survival craft boarded from the embarkation deck should be capable of being launched from two positions by one crew member: from a position in the survival craft and from a position on deck.
- EP 4: All survival and rescue craft should be stowed as near the water surface as is safe and practicable.
- EP 5: All ships should provide for safe unobstructed launching of each survival craft, for example, by avoiding interference with fixed structures, fixtures, fittings, equipment and other life-saving appliances.
- EP 6: Embarkation platforms should provide for protection from the seaway and the effects of hazardous cargo, if carried.

EP 7: Relative movement and gaps between the survival craft and ship during embarkation should be minimized.

EP 8: All life-saving appliances should enable safe abandonment of all persons on board regardless of their physical condition, age and mobility, including those needing evacuation by stretcher or other means.

EP 9: All ships should provide for safe launching of survival craft both in a seaway and when the ship is adrift.

EP 10: Passenger ships should provide float free survival craft capacity for at least 25% of the total number of persons on board and cargo ships should provide 100% float free survival craft capacity for the total number of persons on board.

EP 11: All ships should provide adequate space to muster and provide instructions for all persons on board.

EP 12: Abandonment of all persons on board should take no more than 30 minutes after mustering on passenger ships, and 10 minutes on cargo ships.

EP 13: Each survival craft should be prepared for boarding and launching by no more than two crew members in less than 5 minutes.

EP 14 Life-saving appliances and the craft they launch should operate as a system.

FR 8: All ships should provide means for the safety and survivability of all persons after abandonment for the time until expected rescue. This will be accomplished by ensuring:

EP 1: Survival craft should provide a habitable environment for all persons on board that prevent exposure to a long-term CO₂ concentration of more than 5,000 ppm for at least 24 hours.

EP 2: Survival craft should provide adequate ventilation and protection for its complement against wind, rain and spray at all ambient temperatures between -15 and 30 degrees C.

EP 3: Each survival craft shall have sufficient buoyancy when loaded with its full complement of persons and when punctured in any one location.

EP 4: All passenger ships must have sufficient self-propelled craft capable of marshalling all non-self-propelled survival craft sufficient for the total number of persons on board.

EP 5: Self-propelled survival and rescue craft should be capable of proceeding ahead in calm water at least at 2 knots when towing the largest passive survival craft carried on the ship loaded with its full complement of persons and equipment.

EP 6: Survival craft should be able to reach a safe distance from the ship in a timely manner, either by its own propulsion or by assistance from other survival craft or rescue craft.

EP 7: Each survival craft should have sufficient first aid supplies, anti-seasickness medication, and supply of food and water for the number of persons on board.

EP 8: Survival craft should be approved for the maximum number of persons it is permitted to accommodate, as decided by practical seating tests afloat and based upon the number of adult persons wearing individual buoyancy equipment who can be seated without, in any way, interfering with the normal operation of its equipment or means of propulsion.

EP 9: All life-saving appliances and arrangements should be designed to reflect the expected capabilities and characteristics of persons on board.

EP 10: All survival craft should provide means for persons in the water to cling to the survival craft, and permit persons to board the survival craft from the water when wearing individual buoyancy equipment.

FR 9: Each person should be provided with means to facilitate survival in the water until rescued into a survival craft or rescue unit. This will be accomplished by ensuring:

EP 1: Each person on a cargo ship and each crew member assigned to operate the life-saving appliances on any ship should be provided with individual garments for protection against hypothermia.

EP 2: Each person on board should have ready access to a physically suitable personal life-saving appliance, regardless of their location on the vessel.

EP 3: All ships must ensure individual wearable buoyancy equipment are available for persons on watch and at remote locations on the ship so that they are readily accessible in an emergency.

EP 4: All ships shall ensure that each adult on board has a suitable individual wearable buoyancy equipment considering their weight and girth.

EP 5: Passenger ships shall ensure that each infant and child on board has a suitable individual wearable buoyancy equipment, as appropriate, for the duration of the voyage and the type of service.

EP 6: Throwable personal flotation devices are distributed so that they are readily available on both sides of the ship and as far as practicable on all open decks extending to the ship's side or to the stern.

EP 7: Throwable personal flotation devices are stowed so as to be capable of being rapidly cast loose and not permanently secured in any way.

EP 8: Personal life-saving appliances should be provided with adequate spare capacity.

FR 10: Each survival craft should provide active and passive means of detection by other survival and rescue craft. This will be accomplished by ensuring:

EP 1: Survival craft should have active and passive means of detection which makes it possible to visually locate or detect the survival craft in a seaway from a ship or an aircraft.

EP 2: Visual means of detection for survival craft should make it possible for an aircraft at an altitude of up to 3,000 meters to detect the survival craft at a range of at least 10 miles; and for a ship to detect the survival craft in a seaway in clear conditions at a range of at least 2 miles.

FR 11: All ships should provide active and passive means for detection of persons in the water by survival units and by rescue craft.

EP 1: Visual means of detection for persons in the water should make it possible for a ship to detect the person in a seaway in clear daytime conditions at a range of at least 0.2 miles; and in clear night-time conditions at a range of at least 0.5 miles for a duration of at least 8 hours.

EP 2: Individual wearable buoyancy equipment should have a manually controlled active means of detection which makes it possible to detect a person in a seaway audibly at a range of at least 0.2 miles in calm weather.

EP 3: Buoyancy equipment intended to support and enable the detection of persons in the water should be provided on board. The buoyancy equipment should have passive means of detection, which makes it possible to detect the buoyancy equipment in a seaway visually and, have active means of detection attached which is automatically activated when the buoyancy equipment is deployed.

FR 12: All ships should provide for the search, rescue and retrieval of persons in the water. This will be accomplished by ensuring:

EP 1: Rescue craft should be stowed in such a way that they are kept in a state of continuous readiness and can be launched within 5 minutes and neither the rescue craft nor its stowage arrangements interfere with the operation of any survival craft at any other launching station.

EP 2: Launching arrangements for rescue craft should provide safe launching from the ship in a seaway with the ship making way at speeds of up to 5 knots.

EP 3: Rescue craft should be capable of maintaining a speed of at least 6 knots for at least 4 hours in a seaway.

EP 4: Rescue craft should be capable of being towed at speeds of up to 5 knots and be capable of towing other survival craft.

EP 5: Rescue craft should have sufficient mobility and manoeuvrability in a seaway to enable retrieval of persons from the water. Ro-ro passenger ships should be equipped with effective means for rapidly recovering survivors from the water and transferring survivors from rescue or survival craft to the ship.

EP 6: The full complement of occupants for which the rescue craft is approved to carry must be recovered to a position where they can disembark to the deck of the ship.

EP 7: Rescue craft should be capable of carrying at least five persons seated and at least one person lying down.

ANNEX 2

DRAFT MSC CIRCULAR

INTERIM GUIDELINES ON LIFE-SAVING APPLIANCES AND ARRANGEMENTS FOR SHIPS OPERATING IN POLAR WATERS

1 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], having considered a proposal by the Sub-Committee on Ship Systems and Equipment (SSE), at its sixth session (4 to 8 March 2019), and recognizing the importance of life-saving appliances and arrangements for ships operating in polar waters, with a view to providing interim guidance outlining possible means of mitigating hazards in order to comply with section 8.3 of part I-A of the International Code for Ships Operating in Polar Waters (Polar Code), approved Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters, as set out in the annex.

2 Member States are invited to bring the annexed Interim guidelines to the attention of ship designers, shipyards, shipowners, ship managers, ship operators and other organizations or persons responsible for life-saving appliances and arrangements for ships operating in polar waters.

3 Member States are also invited to bring the annexed Interim guidelines to the attention of shipmasters, ships' officers and crew and all other parties concerned.

ANNEX

INTERIM GUIDELINES ON LIFE-SAVING APPLIANCES AND ARRANGEMENTS FOR SHIPS OPERATING IN POLAR WATERS

1 GENERAL

1.1 These Interim Guidelines outline possible means of mitigating hazards in order to comply with section 8.3 of part I-A of the International Code for Ships Operating in Polar Waters (Polar Code) and are intended to assist ship designers and ship owners/operators, as well as Administrations in the uniform implementation of the Polar Code.

1.2 Compliance with these Interim Guidelines does not necessarily mean that the ship complies with the Polar Code. There may be other hazards, conditions and mitigating means to be considered in the operational assessment required in section 1.5 of part I-A of the Polar Code. The complexity of a prolonged survival time in a harsh environment should not be underestimated.

1.3 Survival after abandonment will rely on several factors, such as the types and combination of equipment, crew training and good leadership of each survival craft. The expected time of rescue is a defining factor for life-saving appliances and arrangements. Conditions that are not otherwise considered critical may become critical over time.

1.4 While equipment enhancement greatly improves survivability, the human element is a significant factor. The crew should have relevant knowledge of human behaviour in extended survival situations, medical first aid and the management of the resources available.

1.5 Key physical parameters for human survival and human behaviour in a crisis should be taken into account when considering life-saving appliances and arrangements for ships operating in polar waters.

1.6 All references to the LSA Code in these Guidelines mean the International Life-Saving Appliance (LSA) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.48(66), as amended.

1.7 Due to the variability of risk levels in polar waters, some of the mitigation means within these Guidelines may not apply to all operations. Any risk mitigation measures applied should be based on the results of the assessment, as required by the Polar Code and the operational limitations identified on the Polar Ship Certificate.

2 CONDITIONS TO CONSIDER

2.1 The Polar Code considers hazards that may lead to elevated levels of risks due to an increased probability of occurrence and/or more severe consequences. The sources of hazards listed in section 3 of the introduction of the Polar Code should be considered for both normal operation and emergency situations.

2.2 These interim guidelines are based on the following specific operational assessment criteria:

- .1 maximum expected time of rescue;
- .2 operation in low air temperatures (ships with an assigned Polar Service Temperature (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.

2.3 In the following provisions, the mitigating means are organized based on their relevance in relation to the specific conditions. Some means may be relevant to more than one of the conditions. The final relevance for each individual ship is dependent on the results of the operational assessment required by section 1.5 of part I-A of the Polar Code.

3 MAXIMUM EXPECTED TIME OF RESCUE

3.1 This section provides guidance for the type and amount of survival equipment related to the maximum expected time of rescue.

Personal and group survival equipment

3.2 The following equipment should be available for all persons after abandonment and for the maximum expected time of rescue, which can be stored in survival craft or be a part of the personal survival equipment or group survival equipment and the Polar Water Operational Manual (PWOM) should consider the location, stowage and transfer of LSA equipment:

- .1 insulated immersion suit or thermal protective aid provided with gloves should be provided with separate gloves, which shall be permanently attached to the suit/protective aid;
- .2 food rations providing a minimum of 5,000 kJ (1,195 kcal) per person per day which should be increased as necessary taking into account the operational assessment;
- .3 at least 2 litres of fresh water per person per day: De-salting apparatus or means to melt ice or snow may supply the amount exceeding the requirements of paragraphs 4.1.5.1.19 and 4.4.8.9 of the LSA Code and there should be a tank or a container of adequate size to collect water from the de-salting apparatus and rainwater collectors;
- .4 anti-seasickness medicine;
- .5 protective clothing of a material with thermal properties taking into account performance of the material when wet and type of survival craft, including head protection, neck and face protection, gloves/mittens, socks, boots, long underpants and sweaters;
- .6 sunglasses or ski goggles appropriate for the expected conditions to protect persons from snow blindness, UV rays, snow ingress and/or cold;
- .7 drinking vessel, preferably with a screw cap;
- .8 polar survival guidance;

- .9 a seasickness bag in addition to the one required by the LSA Code;
- .10 anti-bacterial gel or hand wipes;
- .11 blanket of a material with thermal properties suitable for use on the planned route, for each person on board; and
- .12 other equipment in accordance with section 9.1 of part I-B of the Polar Code, as deemed necessary.

3.3 Personal survival equipment should be packed in a waterproof floatable carrier bag. The personal survival equipment may be stored at the assembly or embarkation stations and should be clearly marked with the size of the person they are intended for (if applicable). The content should include, as a minimum, all equipment needed during the abandonment and the initial part of the survival phase. The carrier bag should also function as each person's personal storage area for equipment handed out during the survival phase in order to keep the survival craft or shelter tidy and habitable.

Capacity of survival craft

3.4 The capacity of each survival craft should comply with the following:

- .1 The seating capacity of each survival craft should be adjusted taking into account polar clothing, additional equipment including all persons carrying their intended personal survival equipment and space for occupants to stand and move in turns.
- .2 Where additional personal and group survival equipment is carried in accordance with paragraphs 8.3.3.3.2 and 8.3.3.3.3 of chapter 8 of part 1-A of the Polar Code, adequate space for the stowage of the equipment should be provided. The total combined weight including additional equipment may not exceed the weight determined for the type approval of the survival craft.

Equipment in survival craft

3.5 The following equipment should be available in the survival craft:

- .1 Effective means of communicating important messages from the person in charge of the survival craft, unless the Administration considers the survival craft small enough to ensure that all important messages can be heard by all persons on board, taking into account the noise level caused by the lifeboat engine, harsh weather, etc.; and
- .2 In addition to the tools required in paragraph 4.4.8.27 of the LSA Code, the lifeboat should be provided with tools and critical spare parts for minor adjustments of the equipment and components to ensure operability during the survival phase.

3.6 Notwithstanding the requirement in paragraph 4.4.8 of the LSA Code that all lifeboat equipment should be as small and of as little mass as possible, it is important that all items are robust to retain their functionality for the maximum expected time of rescue.

3.7 Survival craft should be of a type complying with the following guidelines:

- .1 Survival craft should be fitted with handholds or handhold lines to safeguard persons who are standing upright or moving inside the craft in a seaway.
- .2 In order to provide a habitable environment, all survival craft should be capable of being properly ventilated. The long-term CO₂-level should not exceed 5,000 ppm. The ventilation should be capable of operating continuously for the maximum expected time of rescue. The ventilation should be considered in context with heating requirements to achieve a habitable temperature in the survival craft.
- .3 Each seat in a lifeboat should be provided with a backrest.

4 SHIPS OPERATING IN LOW AIR TEMPERATURE

4.1 This section applies to ships intended to operate in low air temperatures, as defined in the Polar Code, part I-A, regulation 1.2.12.

4.2 All life-saving appliances and arrangements should remain operational and ready for immediate use at the polar service temperature (PST) or at the temperatures specified by the LSA Code, whichever is the lowest. The manufacturer should provide information of additional tests including temperature ranges which the equipment is intended for. This information should be a part of the operating and maintenance manual.

4.3 In the survival craft, the combination of personal survival equipment, ventilation, insulation and heating means, if provided, should be capable of maintaining a habitable inside air temperature when the outside air temperature is equal to the PST. All cold surfaces should be insulated, in particular the surfaces in direct contact with the persons, e.g. seats.

4.4 Installed heating systems, if provided, and their power sources should be capable of operation during the maximum expected time of rescue.

4.5 Means should be provided to avoid icing or dew on the windows of the lifeboat steering position, in order to maintain a proper lookout.

4.6 In order to avoid exposure to cold air, toilet equipment should be provided inside the survival craft.

4.7 Liferafts should be provided with inflatable floors or equivalent and all persons should be wearing insulated immersion suits instead of thermal protective aids.

4.8 Survival craft and containers for group survival equipment in their stowed position should have means to mitigate the freezing of drinking water supplies.

4.9 Lifeboats should be provided with suitable low temperature grade fuel and lubrication oil for the engine and suitable low temperature grade oil for the steering gear, as necessary, or be fitted with a heating system to maintain fuel and lubrication oil at the appropriate viscosity for operation.

5 SHIPS OPERATING IN ICE

5.1 This section applies to Category A and B ships and ice strengthened Category C ships.

5.2 All survival craft should be arranged for launching in such a way that they will not be damaged or cause sufficient impact to injure persons on board.

5.3 Survival and rescue craft and their fittings should be so constructed as to prevent damage from contact with ice when loaded with its full complement of persons and equipment.

5.4 A survival craft should withstand a controlled deployment into the ice conditions expected for the operational area and its propeller, rudder or other external fittings should be capable of operating in such conditions.

6 SHIPS OPERATING IN CONDITIONS WITH RISK OF ICING OF LIFE-SAVING APPLIANCES AND ARRANGEMENTS

6.1 This section applies to ships operating in conditions where ice accretion is likely to occur on life-saving appliances and arrangements.

6.2 Means should be provided to ensure the function of launching appliances, release mechanisms, hydrostatic release units and marine evacuation systems in the expected conditions of icing.

6.3 Lifeboats and rescue boats should maintain positive metacentric height (GM) when loaded as required by paragraph 4.4.5.1 of the LSA Code and with an additional ice load of 30 kg/m² on exposed horizontal surfaces and 7.5 kg/m² for the projected lateral area of each side of the lifeboat.

6.4 Means for removing ice should be provided for all survival craft likely to accumulate ice.

6.5 Entrances, hatches and means of ventilation should be designed and equipped in a way that they can be operated during icing condition to allow mitigation of ice accretion and remove the accumulated ice.

7 SHIPS OPERATING IN HIGH LATITUDES

7.1 This section applies to ships operating in areas with high latitudes.

7.2 Lifeboats and rescue boats on ships proceeding to latitudes over 80°N should be fitted with a non-magnetic means for determining heading. It should be possible to supply the means with power from two independent batteries.

8 SHIPS OPERATING IN EXTENDED PERIODS OF DARKNESS

8.1 This section applies to all ships operating in polar waters during extended periods of darkness.

8.2 Survival craft exterior and interior lights should be capable of being in operation for the extended periods of darkness during the maximum expected time of rescue. Lifeboat searchlights should be capable of being in continuous operation for the maximum expected time of rescue.

9 ABANDONMENT TO ICE OR LAND

9.1 This section applies to ships where the assessment required by paragraph 1.5 of part I-A of the Polar Code identifies a potential of abandonment onto ice or land.

9.2 Special consideration should be given when operating in areas with dangerous wildlife. Additional flares and/or a flare gun should be provided.

Shelter

9.3 The combination of a chosen type of shelter, type of personal thermal protection and other mitigating means should provide a habitable environment on ice or land, while adequately protecting against cold, wind and sun.

9.4 When determining the capacity of the shelters, the expected environmental condition in the operating area should be considered. For ships operating in low air temperature, the calculation should take into account that it might be unsafe for persons to stay outside the shelter, even for short periods. Hence, the same considerations as for survival craft should be taken into account.

9.5 Shelters should have insulated floor or other means to minimize heat transfer to the surface.

Group survival equipment

9.6 The container for group survival equipment when fully loaded should have a size, shape and mass that enables it to be towed through icy water, and also allows two crew members to pull it out the water and tow it on ice or on land.

9.7 Unless the group survival equipment is carried in the survival craft, means should be provided to launch the containers to water, ice or land without damage to the container or its contents. Means to launch such containers should be independent of the ship power system.

ANNEX 3

DRAFT MSC CIRCULAR

INTERIM GUIDELINES FOR MINIMIZING THE INCIDENCE AND CONSEQUENCES OF FIRES IN RO-RO SPACES AND SPECIAL CATEGORY SPACES OF NEW AND EXISTING RO-RO PASSENGER SHIPS

- 1 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], approved *Interim guidelines for minimizing the incidence and consequences of fires in ro-ro spaces and special category spaces of new and existing ro-ro passenger ships*, prepared by the Sub-Committee on Ship Systems and Equipment, at its sixth session, as set out in the annex.
- 2 The Committee agreed to keep the Interim guidelines under review, taking into account operational experience gained with their application.
- 3 Member States are invited to bring the Interim guidelines to the attention of all parties concerned and invited to recount their experience gained through the use of these Interim guidelines to the Organization.

ANNEX

INTERIM GUIDELINES FOR MINIMIZING THE INCIDENCE AND CONSEQUENCES OF FIRES IN RO-RO SPACES AND SPECIAL CATEGORY SPACES OF NEW AND EXISTING RO-RO PASSENGER SHIPS

For the purpose of these Guidelines, section 1 applies to new and existing ro-ro passenger ships and sections 2 to 5, except 3.2 and 3.3, apply only to new ships unless specified otherwise.

1 PREVENTION/IGNITION

1.1 Inspection of ship's power supply equipment and cables

1.1.1 Electrical cables, sockets, and their associated equipment in ro-ro and special category spaces intended for power supply to vehicles or cargo units should be inspected, in principle prior to their use, by trained crew or other trained personnel according to an established procedure.

1.1.2 Non-ship cables provided and connected by drivers present an increased risk of overheating or short circuit; therefore, only ship power supply equipment and cables should be used.

1.2 Maintenance plan for electrical cables and their sockets in ro-ro and special category spaces intended for power supply to vehicles or cargo units

A maintenance plan should be developed for electrical cables, sockets, and their associated equipment in ro-ro and special category spaces intended for power supply to vehicles or cargo units.

1.3 Electrical cables

1.3.1 In addition to SOLAS regulation II-1/45.5.1 to .6, electrical cables intended for power supply to vehicles or cargo units that may be damaged by vehicles or cargo units during loading and unloading operations should be suitably protected, even when armoured, unless the ship's structure provides adequate protection. The arrangement should be sufficiently protected against corrosion and effectively earthed.

1.3.2 When not in use, electric cables intended for power supply to vehicles or cargo units should be stored in a way that they cannot be damaged by loading/unloading operations.

1.4 Shock/waterproof rating of electrical connections

1.4.1 In addition to SOLAS regulation II-2/20.3.2, sockets should be provided with a degree of protection of at least IP56 in accordance with standard IEC 60529.

1.4.2 The socket should be provided with means to maintain the same degree of protection after the plug is removed from the socket. Where a loose cover is used for this purpose, it should be anchored to its socket, for example by means of a chain.

1.5 Circuit breakers

The electrical system should detect potentially detrimental loads or earth faults, so that the affected socket will be isolated.

1.6 Electrical connections and disconnections of cargo units and electrical vehicles

Only trained personnel or other persons under the supervision of ship's crew should perform the electrical connection and disconnection of cargo units and electrical vehicles.

1.7 Check points at patrols

1.7.1 During patrols by crew in ro-ro spaces and special category spaces, the following should be checked, for example, but not limited to:

- .1 leakages from the vehicles;
- .2 conditions of electrical connections and ship's power supply cables to vehicles; and
- .3 common cargo fire hazards.

1.7.2 It is recommended that portable thermal imaging devices be used for screening during fire rounds and upon suspicion to detect hot areas and overheated electrical equipment.

1.8 Strengthening of the requirement for elimination of sources of ignition

1.8.1 The company should establish a fire-fighting plan that, in particular, identifies any risks specific to alternatively powered vehicles, including battery powered vehicles, and outlines the most appropriate fire-fighting techniques for such vehicles. The company should ensure adequate training and good access to any specialized fire-fighting equipment for alternatively powered vehicles.

1.8.2 During voyages when vehicles powered by compressed natural gases or hydrogen are carried, the hazards associated with accumulation of flammable gases and gases lighter than air under ceilings need to be addressed.

1.8.3 Pipes with combustible hydraulic oil should be protected from damage. Hydraulic oil from a damaged pipeline in contact with a source of ignition, for example, a refrigerating unit of a truck working during the voyage, can cause a fire.

2 DETECTION AND DECISION

2.1 Addressable fixed fire detection and alarm systems

2.1.1 For ships built before July 2010, it is recommended that a fixed fire detection and alarm system with individually addressable detectors be considered to replace existing systems in ro-ro spaces and special category spaces.

2.1.2 If a fixed water-based deluge system is used for ro-ro spaces and special category spaces then a fire detection and alarm system addressable to the same sections of the deluge systems should be arranged.

2.1.3 In the design of the fire detection alarm system, it should be designed with a system interface which provides logical and unambiguous presentation of the information, to allow a quick and correct understanding and decision-making. In particular, the alarm system section numbering should coincide with the sections of other systems, such as fixed water-based fire-extinguishing system or television surveillance system, if available.

2.2 Video monitoring

2.2.1 Television surveillance systems can be effective for rapid confirmation of a fire after activation of fire alarms, as well as rapid execution of related actions after the confirmation of fire. This supports the activation of the correct deluge section, as well as manual fire-fighting.

2.2.2 Effective television surveillance systems should be provided in ro-ro and special category spaces for continuous video monitoring of these spaces and be provided with immediate playback capability to allow for quick identification of fire location, as far as practicable. Continuous monitoring of the video image by the crew needs not be ensured.

2.3 Fire detection in open ro-ro spaces

In open ro-ro spaces on all ro-ro passenger ships, if smoke detectors are installed they should be supplemented with other effective means of detection e.g. flame detectors, heat detectors.

2.4 Fire detection on weather decks

A fixed fire detection and fire alarm system should be provided for weather decks intended for the carriage of vehicles. The fixed fire detection system should be capable of rapidly detecting the onset of fire on the weather deck. The type of detectors, spacing, and location should be to the satisfaction of the Administration, taking into account the effects of weather, cargo obstruction and other relevant factors. Different settings may be used for specific operation sequences, such as during loading or unloading and during voyage, in order to reduce the false alarms.

2.5 Alarm system design and integration

Alarm notifications should follow a consistent alarm presentation scheme (wording, vocabulary, colour, and position) and that alarms are immediately recognizable on the bridge and not compromised by noise or poor placing. The interface should provide alarm addressability to allow the crew to identify the alarm history, the most recent alarm, and the means to suppress alarms while ensuring the alarms with ongoing trigger conditions are still clearly visible.

2.6 Signage and markings for effective identification and localization

For closed vehicle, ro-ro spaces, and special category spaces where fixed pressure water-spraying systems are fitted, they should be provided with suitable signage and marking on deck and vertical boundaries to easily identify the sections of the fixed fire-extinguishing system. Signage and markings should be adapted to typical patterns of crew movement and should not be obstructed by fixed installations. Section number signs should be of photoluminescent material complying with ISO 15370. The section numbering indicated inside the space should be the same as the section valve identification and section identification at the safety centre or continuously manned control station.

3 EXTINGUISHMENT

3.1 Additional fire-fighting equipment for ro-ro passenger ships

A claw bar should be available for prompt fire-fighting in all ro-ro spaces and special category spaces.

3.2 Appropriate training and drills

3.2.1 Relevant crew members should be trained on fire-fighting strategies and risks associated with alternatively powered vehicles such as battery or gas driven vehicles.

3.2.2 Relevant crew members should receive adequate training and conduct drills in order to be familiar with the specific arrangements of the ship, as well as the location, operation, and limitations of the fire-fighting systems and appliances that they may be called upon for use in ro-ro spaces and special category spaces.

3.2.3 Decision-making at the early stages of a fire in a ro-ro space should be explicitly included in recurring training and onboard drills. Training should enable all relevant personnel to act in the case of fire and be varied to reflect different combinations of personnel available at the time of a fire alarm, while ensuring that crew actions are supported by sufficient competence and mandate.

3.3 Organizational preconditions for early activation of drencher system

The distribution of responsibilities in case of a fire should be evaluated for sufficient redundancy to increase the likelihood of early drencher activation.

3.4 Positioning of sprinklers and nozzles

MSC.1/Circ.1430/Rev.1 should be referred to with regard to functional requirements for positioning of sprinklers and nozzles to provide satisfactory performance with respect to both activation time and water distribution.

3.5 Fixed fire-extinguishing measures on weather decks

Additional fire-extinguishing measures such as fire monitors and drainage systems may be considered on weather decks. Remotely controlled fire monitors may allow for safe operation of the monitors, but where suitable, manually operated fire monitors may also be used.

4 CONTAINMENT

4.1 Fire integrity of ro-ro decks and decks in special category spaces

The fire integrity of ro-ro decks separating ro-ro spaces should be at least A-30.

4.2 Types of ro-ro spaces

Vehicles spaces and ro-ro spaces should be either closed ro-ro spaces or weather decks.

5 INTEGRITY OF LIFE-SAVING APPLIANCES AND EVACUATION

5.1 For new and existing ships, the following safety distances (measured horizontally) are recommended to avoid jeopardizing life-saving appliances and embarkation stations in case of fire in ro-ro and special category spaces:

- .1 survival craft and marine evacuation systems stowed and in a position to be deployed:
 - .1 more than 6 m from a cargo space side opening; and
 - .2 more than 8 m from cargo on weather deck; and
- .2 survival craft embarkation stations and muster stations located:
 - .1 more than 6 m away from a cargo space side opening; and
 - .2 more than 13 m from cargo on weather deck.

5.2 Equivalent arrangements to the satisfaction of the Administration, providing at least the same level of protection could be considered.

ANNEX 4

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-2

1 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], with a view to providing more specific guidance on SOLAS regulations II-2/9 and II-2/10, approved unified interpretations of SOLAS chapter II-2, prepared by the Sub-Committee on Ship Systems and Equipment, at its sixth session (4 to 8 March 2019), as set out in the annex.

2 Member States are invited to use the annexed unified interpretations as guidance when applying SOLAS regulations II-2/9 and II-2/10, and to bring the unified interpretations to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER II-2

CHAPTER II-2

Construction – Fire protection, fire detection and fire extinction

Regulation 9.2 – Containment of fire, thermal and structural boundaries

In cases where urea or sodium hydroxide solution tanks for selective catalytic reduction (SCR) systems, exhaust gas recirculation (EGR) systems or exhaust gas cleaning systems (EGCS) are installed in a space separated from the engine-room, in determining fire integrity of divisions, the solution tank space should be considered as "similar spaces" in the definition of "machinery spaces" in regulation 3.30 and should be categorized as:

"(10) Tanks, voids and auxiliary machinery spaces having little or no fire risk" in regulation 9.2.2.3.2.2, for ships carrying more than 36 passengers; or

"(7) Other machinery spaces" in regulations 9.2.2.4.2.2, 9.2.3.3.2.2 or 9.2.4.2.2.2, for ships carrying not more than 36 passengers and cargo ships.

The division between the engine-room and the solution tank space should have a fire integrity of at least "A-0" class.

Regulation 9.7.5 – Containment of fire, Ventilation systems, Exhaust ducts from galley ranges

The reference to ISO 15371:2009 in the footnote to both regulations 9.7.5.1.1.3 and 9.7.5.2.4 is given as an example of a suitable performance standard for pre-engineered galley duct fixed fire-extinguishing systems.

CO₂ fire-extinguishing systems, which are not pre-engineered fixed fire-extinguishing systems, should be designed according to the requirements set out in regulation 10.6.3.1.1 (spaces containing flammable liquids) or another suitable standard acceptable to the Administration.

Regulation 10.10.4 – Fire-fighting, Fire-fighter's outfits, Fire-fighter's communication

Two-way portable radiotelephone apparatus for fire-fighter's communication required by regulation 10.10.4 should be of certified safe type suitable for use in zone 1 hazardous areas, as defined in IEC Publication 60079.

The minimum requirements in respect to the apparatus group and temperature class are to be consistent with the most restrictive requirements for the hazardous area zone on board which is accessible to fire party.

ANNEX 5

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS OF THE IGC CODE

1 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], with a view to providing more specific guidance on paragraphs 11.3.6 and 11.4.8 of the IGC Code, approved unified interpretations of the Code, prepared by the Sub-Committee on Ship Systems and Equipment, at its sixth session (4 to 8 March 2019), as set out in the annex.

2 Member States are invited to use the annexed unified interpretations as guidance when applying paragraphs 11.3.6 and 11.4.8 of the IGC Code, and to bring the unified interpretations to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATIONS OF THE IGC CODE

Paragraph 11.3.6 – Fire protection and extinction, Water-spray system

Where "F.O. tanks" are installed at the after end of the aftermost hold space or at the forward end of the forwardmost hold space instead of cofferdams as allowed for in paragraphs 3.1.2 and 3.1.3 of the IGC Code, the weather deck area above these tanks should be regarded as a "cargo area" for the purpose of applying paragraph 11.3.6.

Paragraph 11.4.8 – Fire protection and extinction, Dry chemical powder fire-extinguishing systems

Testing arrangements should involve the discharge using dry chemical powder from all monitors and hand hose lines on board but it is not required that there is a full discharge of the installed quantity of dry powder. This testing can also be used to satisfy the requirement that the piping is free of obstructions, in lieu of blowing through with dry air all the distribution piping. However, after the completion of this testing, the system, including all monitors and hand hose lines, should be blown through with dry air but only for the purpose of the system subsequently being clear from any residues of dry chemical powder.

ANNEX 6

JUSTIFICATION FOR A NEW OUTPUT ON AMENDMENTS TO SOLAS CHAPTER III, THE LSA CODE AND THE REVISED RESOLUTION MSC.81(70) TO REMOVE THE APPLICABILITY OF THE REQUIREMENTS TO LAUNCH FREE-FALL LIFEBOATS WITH THE SHIP MAKING HEADWAY AT SPEEDS UP TO 5 KNOTS IN CALM WATER

Introduction

1 This proposal is submitted in accordance with paragraphs 4.6 and 6.12.2 of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.1), taking into account Resolution A.1111(30) on *Application of the Strategic Plan of the Organization*.

2 It is proposed to add a new output on the application of the requirement to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water.

3 Reference is made to document SSE 6/12/2 (IACS), which discusses the implementation of SOLAS regulation III/33.2 and paragraph 5.4 of part 2 of resolution MSC.81(70), as amended, and seeks clarification on the matter of the application of the requirement to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water. Following the discussion during SSE 6, the Sub-Committee decided to develop a justification for a new output, with a view to developing appropriate amendments to relevant provisions of SOLAS chapter III, the LSA Code and resolution MSC.81(70) for submission to MSC 101, in accordance with MSC-MEPC.1/Circ.5/Rev.1.

4 This proposal is submitted in accordance with annex 3 of resolution A.1111(30) dated 8 December 2017.

IMO objective

5 The proposal falls under the scope of IMO's mission and vision to promote safe, secure, environmentally sound, efficient and sustainable shipping through cooperation, by adopting the highest practicable standards of maritime safety and security, efficiency of navigation and prevention and control of pollution from ships.

Need

6 As specified above, neither SOLAS regulation III/33.2, nor section 4.4.1.3.2 of the LSA Code, nor paragraph 5.4 of part 2 of resolution MSC.81(70), as amended, clearly specifies the non-applicability of these requirements to free-fall lifeboats.

7 The expression used in the regulation, the Code and the Revised Recommendation only refers to "lifeboats", which can be read literally as "all lifeboats, including free-fall lifeboats".

8 The launching of a free-fall lifeboat from the stern of the ship while making headway at speeds of not less than 5 knots in calm water does not carry additional risk or hazard, then the requirements referred to in paragraph 6 above should be interpreted as being only applicable to davit-launched lifeboats and not applicable to free-fall lifeboats. Additionally, it is not considered that these requirements apply to the secondary means of launching of free-fall lifeboats.

9 The Sub-Committee agreed that this issue should be addressed by a proposal for a new output with a view to submitting it to the Committee's next session (MSC 101) for consideration.

10 By developing these draft amendments, Administrations will be provided with a clear understanding of the applicability of these requirements for free-fall lifeboats.

Analysis of the issue

11 The provisions of SOLAS regulation III/33.2 state that:

"On cargo ships of 20,000 gross tonnage and upwards, lifeboats shall be capable of being launched, where necessary utilizing painters, with the ship making headway at speeds up to 5 knots in calm water".

12 Paragraph 4.4.1.3.2 of the LSA Code on general requirements for lifeboats states the following:

"4.4.1.3 All lifeboats shall be of sufficient strength to:

...
.2 be capable of being launched and towed when the ship is making headway at a speed of 5 knots in calm water."

13 Paragraph 5.4 of part 2 of Resolution MSC.81(70) on the *Revised Recommendation on Testing of Life-Saving Appliances*, as amended, states the following:

"5.4 Launch test

It should be demonstrated that the fully equipped lifeboat on cargo ships of 20,000 gross tons or more and rescue boat can be launched from a ship proceeding ahead at a speed of not less than 5 knots in calm water and on an even keel. There should be no damage to the lifeboat or the rescue boat or their equipment as a result of this test."

14 In terms of the feasibility, practicability and proportionality, it is considered there are no safety benefits in implementing the above provisions for free-fall lifeboats, conducting such test on the davit launched lifeboats verifies that the launching arrangements are of adequate strength taking into account the dynamic load that is thereby exerted. This is not relevant in the context of free-fall lifeboats.

Analysis of implications

15 It is anticipated that this proposal does not incur any additional cost to the maritime industry. Checklist for identifying administrative requirements are included in annex 4.

Benefits

16 It is expected that these amendments will clarify the intended non-applicability of the requirement to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water.

17 The amendments will facilitate the global and consistent implementations of these provisions.

Industry standards

18 There are no relevant industry standards other than those IMO provisions referred to above.

Output

19 The proposed new title of the output is "Amendments to SOLAS chapter III, LSA Code and resolution MSC.81(70) to remove the applicability of the requirements to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water"

Human element

20 The completed *Checklist for considering human element issues by IMO bodies* (MSC-MEPC.7/Circ.1) is provided in annex 2.

Urgency

21 The work on the output should be completed in one session, with the Sub-Committee on Ship Systems and Equipment (SSE) as the associated organ. The item should be included in the biennial agenda for 2020-2021 and the provisional agenda for SSE 7.

Action requested of the Committee

22 The Committee is invited to consider the above justification for a new output on "Amendments to SOLAS chapter III, LSA Code and resolution MSC.81(70)" to remove the applicability of the requirements to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water", for inclusion in the biennial agenda for 2020-2021 and the provisional agenda for SSE 7, and take action, as appropriate.

APPENDIX A

CHECKLIST FOR CONSIDERING HUMAN ELEMENT ISSUES BY IMO BODIES

Instructions: If the answer to any of the questions below is: <ul style="list-style-type: none"> (A) YES, the preparing body should provide supporting details and/or recommendation for further work. (B) NO, the preparing body should make proper justification as to why human element issues were not considered. (C) NA (Not Applicable) – the preparing body should make proper justification as to why human element issues were not considered applicable. 	
Subject Being Assessed: SOLAS chapter III, the LSA Code and resolution MSC.81(70)	
Responsible Body: Sub-Committee on Ship Systems and Equipment (SSE)	
1. Was the human element considered during development or amendment process related to this subject?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
2. Has input from seafarers or their proxies been solicited?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
3. Are the solutions proposed for the subject in agreement with existing instruments? (Identify instruments considered in comments section)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
4. Have human element solutions been made as an alternative and/or in conjunction with technical solutions?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
5. Has human element guidance on the application and/or implementation of the proposed solution been provided for the following:	
• Administrations?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
• Shipowners/managers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
• Seafarers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
• Surveyors?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
6. At some point, before final adoption, has the solution been reviewed or considered by a relevant IMO body with relevant human element expertise?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
7. Does the solution address safeguards to avoid single person errors?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
8. Does the solution address safeguards to avoid organizational errors?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
9. If the proposal is to be directed at seafarers, is the information in a form that can be presented to and is easily understood by the seafarer?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
10. Have human element experts been consulted in development of the solution?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
11. HUMAN ELEMENT: Has the proposal been assessed against each of the factors below?	
<input type="checkbox"/> CREWING. The number of qualified personnel required and available to safely operate, maintain, support and provide training for system.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<input type="checkbox"/> PERSONNEL. The necessary knowledge, skills, abilities and experience levels that are needed to properly perform job tasks.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA

<input type="checkbox"/> TRAINING. The process and tools by which personnel acquire or improve the necessary knowledge, skills and abilities to achieve desired job/task performance.	<input type="checkbox"/> Yes <input type="checkbox"/> No x NA
<input type="checkbox"/> OCCUPATIONAL HEALTH AND SAFETY. The management systems, programmes, procedures, policies, training, documentation, equipment, etc. to properly manage risks.	<input type="checkbox"/> Yes <input type="checkbox"/> No x NA
<input type="checkbox"/> WORKING ENVIRONMENT. Conditions that are necessary to sustain the safety, health and comfort of those on working on board, such as noise, vibration, lighting, climate and other factors that affect crew endurance, fatigue, alertness and morale.	<input type="checkbox"/> Yes <input type="checkbox"/> No x NA
<input type="checkbox"/> HUMAN SURVIVABILITY. System features that reduce the risk of illness, injury or death in a catastrophic event such as fire, explosion, spill, collision, flooding or intentional attack. The assessment should consider desired human performance in emergency situations for detection, response, evacuation, survival and rescue and the interface with emergency procedures, systems, facilities and equipment.	<input type="checkbox"/> Yes <input type="checkbox"/> No x NA
<input type="checkbox"/> HUMAN FACTORS ENGINEERING. Human-system interface to be consistent with the physical, cognitive and sensory abilities of the user population.	<input type="checkbox"/> Yes <input type="checkbox"/> No x NA
Comments: The proposal is in agreement with SOLAS chapter III, THE LSA Code and resolution MSC.81(70)	

APPENDIX B

CHECK/MONITORING SHEET FOR THE PROCESS OF AMENDING THE CONVENTION AND RELATED MANDATORY INSTRUMENTS (PROPOSAL/DEVELOPMENT)

Part I – Submitter of proposal (refer to paragraph 3.2.1.1)*

1	<i>Submitted by SSE 6</i>
2	<i>MSC 101</i>
3	<i>Date 6 March 2019</i>

Part II – Details of proposed amendment(s) or new mandatory instrument (refer to paragraphs 3.2.1.1 and 3.2.1.2)*

1	<i>Strategic direction</i>
	<i>N/A (other work)</i>
2	<i>Title of the output</i>
	"Amendments to SOLAS chapter III, LSA Code and resolution MSC.81(70) to remove the applicability of the requirements to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water"
3	<i>Recommended type of amendments (MSC.1/Circ.1481) (delete as appropriate)</i>
	Four-year cycle of entry into force
4	<i>Instruments intended for amendment (SOLAS, LSA Code, etc.) or developed (new code, new version of a code, etc.)</i>
	SOLAS chapter III, the LSA Code and resolution MSC.81(70)
5	<i>Intended application (scope, size, type, tonnage/length restriction, service (International/non-international), activity, etc.)</i>
	All ships to which SOLAS chapter III, the LSA Code and resolution MSC.81(70) apply.
6	<i>Application to new/existing ships</i>
	New and existing ships.
7	<i>Proposed coordinating sub-committee</i>
	SSE
8	<i>Anticipated supporting sub-committees</i>
	None
9	<i>Timescale for completion</i>
	One session
Part II – Details of proposed amendment(s) or new mandatory instrument (refer to paragraphs 3.2.1.1 and 3.2.1.2)*	
10	<i>Expected date(s) for entry into force and implementation/application</i>
	1 July 2024
11	<i>Any relevant decision taken or instruction given by the Committee</i>
	None

* Parts I and II should be completed by the submitter of a proposed new amendment, to the fullest extent possible.

APPENDIX C

CHECKLIST FOR IDENTIFYING ADMINISTRATIVE REQUIREMENTS

This checklist should be used when preparing the analysis of implications required in submissions of proposals for inclusion of outputs. For the purpose of this analysis, the term "administrative requirement" is defined in accordance with resolution A.1043(27), as an obligation arising from a mandatory IMO instrument to provide or retain information or data.

Instructions:

- (A) If the answer to any of the questions below is **YES**, the Member State proposing an output should provide supporting details on whether the requirements are likely to involve start-up and/or ongoing costs. The Member State should also give a brief description of the requirement and, if possible, provide recommendations for further work, e.g. would it be possible to combine the activity with an existing requirement?
- (B) If the proposal for the output does not contain such an activity, answer **NR** (Not required).
- (C) For any administrative requirement, full consideration should be given to electronic means of fulfilling the requirement in order to alleviate administrative burdens.

1. Notification and reporting? Reporting certain events before or after the event has taken place, e.g. notification of voyage, statistical reporting for IMO Members	NR X	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		
2. Record-keeping? Keeping statutory documents up to date, e.g. records of accidents, records of cargo, records of inspections, records of education	NR X	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		
3. Publication and documentation? Producing documents for third parties, e.g. warning signs, registration displays, publication of results of testing	NR X	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		
4. Permits or applications? Applying for and maintaining permission to operate, e.g. certificates, classification society costs	NR X	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		
5. Other identified requirements?	NR X	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing

ANNEX 7

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER III

1 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], with a view to providing more specific guidance on SOLAS regulations III/20.11, III/22.1.1 and III/32.1.1, approved unified interpretations of SOLAS chapter III, prepared by the Sub-Committee on Ship Systems and Equipment, at its sixth session (4 to 8 March 2019), as set out in the annex.

2 Member States are invited to use the annexed unified interpretations as guidance when applying SOLAS regulations III/20.11, III/22.1.1 and III/32.1.1, and to bring the unified interpretations to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATIONS OF SOLAS CHAPTER III

Regulation 20.11 – Operational readiness, maintenance and inspections, maintenance, thorough examination, operational testing, overhaul and repair of lifeboats, rescue boats and fast rescue boats, launching appliances and release gear

The thorough examinations, overhauls and operational tests, carried out at intervals of at least once every five years, should be done in the presence of a surveyor.

Regulation 22.1.1 – Personal life saving appliances, lifebuoys

Regulation 32.1.1 – Personal life saving appliances, lifebuoys

When considering the minimum number and distribution of lifebuoys as required by regulations 22.1.1 or 32.1.1, as applicable, a lifebuoy, fitted with both a light and a lifeline as per MSC.1/Circular.1331 for compliance with SOLAS regulation II-1/3-9.2, should not be taken into account.

ANNEX 8

DRAFT MSC CIRCULAR

UNIFIED INTERPRETATIONS OF SOLAS REGULATIONS II-1/28 AND, II-1/29 AND II-1/30*

1 The Maritime Safety Committee, at its ninetieth session (16 to 25 May 2012), with a view to ensuring a uniform approach towards the application of the provisions of SOLAS regulations II-1/28 and II-1/29, and following a recommendation made by the Sub-Committee on Ship Design and Equipment at its fifty-fifth session, approved ~~the annexed~~ unified interpretations concerning 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, as contained in *Unified interpretation of SOLAS regulations II-1/28 and II-1/29* (MSC.1/Circ.1416).

2 Noting that the 1974 SOLAS Convention adequately addressed steering gear arrangements having a traditional propulsion system and a rudder-type steering system, whereas it did not adequately provide for modern combined propulsion/steering systems such as azimuth thrusters, podded propulsors, waterjets, cycloidal propellers, etc. and that there was a need to clarify that the requirements of SOLAS regulation II-1/30.2 apply to each steering system in ships fitted with multiple steering systems, the Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], approved the *Unified interpretation of SOLAS regulations II-1/28, II-1/29 and II-1/30*, prepared by the Sub-Committee on Ship Systems and Equipment, at its sixth session (4 to 8 March 2019), as set out in the annex.

3 Member Governments are invited to use the annexed interpretations from ~~21 May 2012~~ [... June 2019] when applying the relevant provisions of SOLAS regulations II-1/28, and II-1/29 and II-1/30, and to bring them to the attention of all parties concerned.

4 This circular supersedes MSC.1/Circ.1416.

* Grey shading indicates modifications to MSC.1/Circ.1416 in the form of strikeouts and new or amended text.

ANNEX

UNIFIED INTERPRETATIONS CONCERNING 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

INTRODUCTION

The SOLAS requirements for steering gears have been established for ships having a traditional propulsion system and one rudder. For ships fitted with alternative propulsion and steering arrangements, such as but not limited to, azimuthing propulsors or water jet propulsion systems, SOLAS regulations II-1/28.2, 28.3, 29.1, 29.2.1, 29.3, 29.4, 29.6.1 and 29.14 and 30.2 should be interpreted as follows, except 29.14, which is limited to the steering systems having a certain steering capability due to ship speed also in case propulsion power has failed.

REGULATION 28 – MEANS OF GOING ASTERN

Paragraph 2

~~The ability of the machinery to reverse the direction of thrust in sufficient time, and so to bring the ship to rest within a reasonable distance from maximum ahead service speed, should be demonstrated and recorded.~~

Paragraph 3

The stopping times, ship headings and distances recorded on trials, together with the results of trials to determine the ability of ships having multiple propulsion/steering arrangements to navigate and manoeuvre with one or more of these devices inoperative, should be available on board for the use of the master or designated personnel.

REGULATION 29 – STEERING GEAR

Paragraph 1

For a ship fitted with multiple steering-propulsion units ~~steering systems~~, such as but not limited to azimuthing propulsors or water jet propulsion systems, ~~the requirement in SOLAS regulation II-1/29.1 is considered satisfied if each of the steering systems is equipped with its own dedicated steering gear.~~ each of the steering-propulsion units should be provided with a main steering gear and an auxiliary steering gear or with two or more identical steering actuating systems in compliance with interpretation of regulation 29.6.1. The main steering gear and the auxiliary steering gear should be so arranged that the failure of one of them will not render the other one inoperative.

For a ship fitted with a single steering-propulsion unit the requirement in regulation 29.1 is considered satisfied if the steering gear is provided with two or more steering actuating systems, and is in compliance with interpretation of regulation 29.6.1. A detailed risk assessment should be submitted in order to demonstrate that in the case of any single failure in the steering gear, control system and power supply the ship steering is maintained.

Paragraph 2.1

All components used in steering arrangements for ship directional control should be of sound reliable construction to the satisfaction of the Administration or recognized organizations acting on its behalf classification society. Special consideration should be given to the suitability of any essential component which is not duplicated. Any such essential component should, where appropriate, utilize anti-friction bearings such as ball bearings, roller bearings or sleeve bearings which should be permanently lubricated or provided with lubrication fittings.

Paragraph 3

The main steering arrangements for ship directional control should be:

- .1 of adequate strength and capable of steering the ship at maximum ahead service speed which should be demonstrated;
- .2 capable of changing direction of the ~~ship's directional control system~~ steering-propulsion unit from one side to the other at declared steering angle limits at an average ~~rotational~~ turning speed of not less than 2.3°/s with the ship running ahead at maximum ahead service speed;
- .3 for all ships, operated by power; and
- .4 so designed that they will not be damaged at maximum astern speed; this design requirement need not be proved by trials at maximum astern speed and declared steering angle limits.

Ship's manoeuvrability tests, such as according to resolution MSC.137(76), should be carried out with steering angles not exceeding the declared steering angle limits.

Definition: *Declared steering angle limits* are the operational limits in terms of maximum steering angle, or equivalent, according to manufacturers guidelines for safe operation, also taking into account the ship's speed or propeller torque/speed or other limitation; the "declared steering angle limits" are to be declared by the directional control system manufacturer for each ship specific non-traditional steering mean; ship's manoeuvrability tests, such as those in the Standards for ship manoeuvrability (resolution MSC.137(76)) should be carried out with steering angles not exceeding the declared steering angle limits.

Paragraph 4

The auxiliary steering arrangements for ship directional control should be:

- .1 of adequate strength and capable of steering the ship at navigable speed and of being brought speedily into action in an emergency;
- .2 capable of changing direction of the ship's directional control system from one side to the other at declared steering angle limits at an average ~~rotational~~ turning speed, of not less than 0.5°/s; with the ship running ahead at one half of the maximum ahead service speed or 7 knots, whichever is the greater; and
- .3 for all ships, operated by power where necessary to meet the requirements of 29.4.2 and in any ship having power of more than 2,500 kW propulsion power per ~~steering-propulsion~~ ~~thruster~~ unit.

Ship's manoeuvrability tests, such as according to resolution MSC.137(76), should be carried out with steering angles not exceeding the declared steering angle limits.

The definition of "declared steering angle limits", given under the interpretation of paragraph 3 above, applies.

Paragraph 6.1

~~In a ship fitted with multiple steering systems, such as but not limited to azimuthing propulsors or water jet propulsion systems, an auxiliary steering gear need not be fitted, provided that:~~

- ~~.1 in a passenger ship, each of the steering systems is fitted with two or more identical power units, capable of satisfying the requirements in regulation 29.3.2 while anyone of the power units is out of operation;~~
- ~~.2 in a cargo ship, each of the steering systems is fitted with one or more identical power units, capable of satisfying the requirements in regulation 29.3.2 while operating with all power units;~~
- ~~.3 each of the steering systems is arranged so that after a single failure in its piping or in one of the power units, ship steering capability (but not individual steering system operation) can be maintained or speedily regained (e.g. by the possibility of positioning the failed steering system in a neutral position in an emergency, if needed).~~

For a ship fitted with a single steering-propulsion unit where the main steering gear comprises two or more identical power units and two or more identical steering actuators, an auxiliary steering gear need not be fitted provided that the steering gear:

- .1 in a passenger ship, is capable of satisfying the requirements in interpretation to regulation 29.3 while any one of the power units is out of operation;
- .2 in a cargo ship, is capable of satisfying the requirements in interpretation to regulation 29.3 while operating with all power units; and
- .3 is arranged so that after a single failure in its piping system or in one of the power units, steering capability can be maintained or speedily regained.

For a ship fitted with multiple steering-propulsion units, where each main steering system comprises two or more identical steering actuating systems, an auxiliary steering gear need not be fitted provided that each steering gear:

- .1 in a passenger ship, is capable of satisfying the requirements in interpretation to regulation 29.3 while any one of the steering gear steering actuating systems is out of operation;
- .2 in a cargo ship, is capable of satisfying the requirements in interpretation to regulation 29.3 while operating with all steering gear steering actuating systems;
- .3 is arranged so that after a single failure in its piping or in one of the steering actuating systems, steering capability can be maintained or speedily regained; and
- .4 The above capacity requirements apply regardless whether the steering systems are arranged with common or dedicated power units.

Definition: *Steering gear power unit* – For the purposes of alternative steering arrangements, the steering gear power unit should be considered as defined in SOLAS regulation II-1/3. For electric steering gears, refer to SOLAS regulation II-1/3; electric steering motors should be considered as part of the power unit and actuator.

Paragraph 14

This interpretation is valid to ~~steering-propulsion units for steering systems~~ having a certain proven steering capability due to ship speed also in case propulsion power has failed.

Where the propulsion power exceeds 2,500 kW per thruster unit, an alternative power supply, sufficient at least to supply the steering arrangements which complies with the requirements of paragraph 4.2 and also its associated control system and the steering gear system response indicator, should be provided automatically, within 45 s, either from the emergency source of electrical power or from an independent source of power located in the steering gear compartment. This independent source of power should be used only for this purpose. In every ship of 10,000 gross tonnage and upwards, the alternative power supply should have a capacity for at least 30 min of continuous operation and in any other ship for at least 10 min.

REGULATION 30 – ADDITIONAL REQUIREMENTS FOR ELECTRIC AND ELECTROHYDRAULIC STEERING GEAR

Paragraph 2

For a ship fitted with multiple steering systems, the requirements in SOLAS II-1/30.2 are to be applied to each of the steering systems.

ANNEX 9

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

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	1.3 (NEW)	Validated model training courses	Continuous	MSC/MEPC	III/HTW/PPR/CCC/SDC/SSE/NCSR				MSC 100/20, paragraphs 10.3 to 10.6, and 17.28
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; MSC 100/20, paragraphs 9.5 and 9.6

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight new insertions.

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	1.27	Revision of the Standardized Life-Saving Appliance Evaluation and Test Report Forms (MSC/Circ.980 and addenda)	2020	MSC	SSE			In progress	MSC 99/22, paragraphs 20.29 and 20.32
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	Extended	MSC 94/21, paragraphs 18.5 and 18.6; MSC 96/25, paragraphs 10.1 to 10.3; MSC 97/22, paragraph 19.2
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	Extended	MSC 82/24, paragraph 3.92; MSC 98/23, annex 38; SSE 6/18, section 3
Notes:	Work in SOLAS chapter III completed. Target completion date extended to 2021.								

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	2.8	Development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, if necessary	2020	MSC	III/HTW/SDC	SSE	In progress	In progress	MSC 98/23, paragraph 20.36; SSE 6/18, section 11
Notes:		Description amended and HTW was added as associated organ							
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	In progress	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	No work requested	MEPC 70/18, paragraph 15.10; PPR 5/24, section 12

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
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/NCSR		Continuous	Continuous	MSC 76/23, paragraph 20.3; MSC 78/26, paragraph 22.12; SSE 6/18, section 12
Notes:	A 28 expanded the output to include all proposed unified interpretations to provisions of IMO safety, security, and environment-related conventions								
6. Ensure regulatory effectiveness	6.14	Amendments to paragraph 4.4.7.6.17 of the LSA Code concerning single fall and hook systems with on-load release capability	2019	MSC		SSE		Extended	MSC 99/22, paragraphs 20.24 and 20.32

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
6. Ensure regulatory effectiveness	6.15	Role of the human element	Continuous	MSC / MEPC	III/PPR/ CCC/SDC/ SSE/NCSR	HTW		No work requested	MSC 89/25, paragraphs 10.10, 10.16 and 22.39, and annex 21; MSC 100/20, paragraph 17.28
OW. Other work	OW 27	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	2020	MSC	SSE			In progress	MSC 98/23, paragraph 20.34; SSE 6/18, section 8
Notes:	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	No work requested	MSC 95/22, paragraph 19.22
OW. Other work	OW 34	Requirements for onboard lifting appliances and anchor handling winches	2019	MSC	HTW	SSE	In progress	Extended	MSC 89/25, paragraph 22.26; MSC 98/23, annex 38; SSE 6/18, section 9
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	Extended	MSC 97/22, paragraph 19.19; MSC 98/23, paragraph 12.42; SSE 6/18, section 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 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	Completed	MSC 95/22, paragraphs 19.20 and 19.32; MSC 98/23, annex 38; SSE 6/18, section 10
OW. Other work	OW 39	Amendments to MSC.1/Circ.1315	2019	MSC	SSE		In progress	Extended	MSC 98/23, paragraph 20.37; SSE 6/18, section 7
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	Extended	MSC 93/22, paragraphs 10.44, 10.50 and 20.12; MSC 96/25, paragraph 3.77; MSC 97/22, paragraphs 8.32 and 19.25; SSE 6/18, section 5
Notes:	Target completion year extended to 2021.								

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 47	Develop new requirements for ventilation of survival craft	2019	MSC	SSE		In progress	Extended	MSC 97/22, paragraph 19.22; SSE 6/18, section 4
Notes:	Target completion year extended to 2021.								
OW. Other work	OW 48	Amendments to the FSS Code for CO2 pipelines in under-deck passageways	2018	MSC	SSE		Completed		MSC 96/25, paragraph 23.26; MSC 98/23, annex 38; 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
156	2018-2019	SD 6 (Ensure regulatory effectiveness)	Development of amendments to the LSA Code to revise the lowering speed of survival craft and rescue boats for cargo ships	MSC	SSE		2	MSC 99/22, paragraph 20.15
157	2018-2019	SD 6 (Ensure regulatory effectiveness)	Revision of the Code of safety for diving systems (resolution A.831(19)) and the Guidelines and specifications for hyperbaric evacuation systems (resolution A.692(17))	MSC	SSE		2	MSC 99/22, paragraph 20.26

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					
158	2018-2019	SD 6 (Ensure regulatory effectiveness)	Amendments to SOLAS chapter III and chapter IV of the LSA Code to require the carriage of self-righting or canopied reversible liferafts for new ships	MSC	SSE		2	MSC 99/22, paragraphs 20.22 and 20.23
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
162	2018-2019	OW (Other work)	Development of amendments to SOLAS chapter II-1 to include requirements for water level detectors on non-bulk carrier cargo ships with multiple cargo holds	MSC	SSE	SDC	2	MSC 100/20, paragraph 17.3

ANNEX 10

PROPOSED BIENNIAL AGENDA FOR THE 2020-2021 BIENNIUM*

Sub-Committee on Ship Systems and Equipment (SSE)									
Reference to SD, applicable	Output if 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	1.3 (NEW)	Validated model training courses	Continuous	MSC / MEPC	III/HTW/PPR/CCC/SDC/SSE/NCSR				MSC 100/20, paragraphs 10.3 to 10.6, and 17.28
1. Improve implementation	1.20	Uniform implementation of paragraph 6.1.1.3 of the LSA Code	2018	MSC	SSE				MSC 96/25, paragraph 23.28; SSE 5/17, section 5; MSC 100/20, paragraph 9.5
1. Improve implementation	1.27	Revision of the Standardized Life-Saving Appliance Evaluation and Test Report Forms (MSC/Circ.980 and addenda)	2020	MSC	SSE				MSC 99/22, paragraphs 20.29 and 20.32 SSE 6/18, section 14

* Amended text shown in tracked changes using "strikeout" for deleted text and "grey shading" to highlight new insertions.

Sub-Committee on Ship Systems and Equipment (SSE)									
Reference to SD, applicable	Output if 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	2.5	Safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapter II-1 and III	2019 2021	MSC	SSE				MSC 82/24, paragraph 3.92; MSC 98/23, annex 38; SSE 6/18, 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/HTW/SDC	SSE			MSC 98/23, paragraph 20.36; SSE 6/18, section 11
Notes:	Description amended and HTW was added as associated organ								
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			MSC 98/23, paragraph 20.27; SSE 6/18, paragraph 17.8

Sub-Committee on Ship Systems and Equipment (SSE)									
Reference to SD, applicable	Output if 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	2.14	Amendments to regulation 14 of MARPOL Annex VI to require a dedicated sampling point for fuel oil	[2019]	MEPC	SSE	PPR			MEPC 70/18, paragraph 15.10; PPR 5/24, section 12
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/NCSR				MSC 76/23, paragraph 20.3; MSC 78/26, paragraph 22.12; SSE 6/18, section 12
Notes:	A 28 expanded the output to include all proposed unified interpretations to provisions of IMO safety, security, and environment-related conventions								
6. Ensure regulatory effectiveness	6.14	Amendments to paragraph 4.4.7.6.17 of the LSA Code concerning single fall and hook systems with on-load release capability	2019 2021	MSC		SSE			MSC 99/22, paragraphs 20.24 and 20.32

Sub-Committee on Ship Systems and Equipment (SSE)									
Reference to SD, applicable	Output if 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
6. Ensure regulatory effectiveness	6.15	Role of the human element	Continuous	MSC / MEPC	III/PPR/CCC/SDC/SSE/NCSR	HTW			MSC 89/25, paragraphs 10.10, 10.16 and 22.39, and annex 21; MSC 100/20, paragraph 17.28
OW. Other work	OW 27	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	2020	MSC	SSE				MSC 98/23, paragraph 20.34; SSE 6/18, section 8
Notes:	MSC 98 agreed to include this output in the provisional agenda for SSE 6								
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			MSC 95/22, paragraph 19.22

Sub-Committee on Ship Systems and Equipment (SSE)									
Reference to SD, applicable	Output if 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 34	Requirements for onboard lifting appliances and anchor handling winches	2019 2020	MSC	HTW	SSE			MSC 89/25, paragraph 22.26; MSC 98/23, annex 38; SSE 6/18, section 9
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 2021	MSC	HTW/SDC	SSE			MSC 97/22, paragraph 19.19; MSC 98/23, paragraph 12.42; SSE 6/18, section 6
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			MSC 95/22, paragraphs 19.20 and 19.32; SSE 5/17, section 11

Sub-Committee on Ship Systems and Equipment (SSE)									
Reference to SD, applicable	Output if 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 39	Amendments to MSC.1/Circ.1315	2019 2020	MSC	SSE				MSC 98/23, paragraph 20.37; SSE 6/18, section 7
OW. Other work	OW 43	Consequential work related to the new International Code for Ships Operating in Polar Waters	2019 2021	MSC	SSE/NCSR	SDC			MSC 93/22, paragraphs 10.44, 10.50 and 20.12; MSC 96/25, paragraph 3.77; MSC 97/22, paragraphs 8.32 and 19.25; SSE 6/18, section 5
OW. Other work	OW 47	Develop new requirements for ventilation of survival craft	2019 2021	MSC	SSE				MSC 97/22, paragraph 19.22; SSE 6/18, section 4
OW. Other work	OW 48	Amendments to the FSS Code for CO ₂ pipelines in under-deck passageways	2018	MSC	SSE				MSC 96/25, paragraph 23.26;

Sub-Committee on Ship Systems and Equipment (SSE)									
Reference to SD, applicable	Output if 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
									MSC 98/23, annex 38; SSE 5/17, section 8; SSE 5/17, section 8
SD 6 (Ensure regulatory effectiveness)	157	Revision of the Code of safety for diving systems (resolution A.831(19)) and the Guidelines and specifications for hyperbaric evacuation systems (resolution A.692(17))	2021	MSC	SSE				MSC 99/22, paragraph 20.26
SD 2 (Integrate new and advancing technologies in the regulatory framework)	150	Revision of SOLAS chapter III and the LSA Code	2024	MSC	SSE				MSC 82/24, paragraph 3.92; MSC 98/23, annex 38; SSE 6/18, section 3
Notes:	To remove gaps, inconsistencies and ambiguities based on the safety objectives, functional requirements and expected performance for SOLAS chapter III								

Sub-Committee on Ship Systems and Equipment (SSE)									
Reference to SD, applicable	Output if 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	[...]	Amendments to SOLAS chapter III, LSA code and Resolution MSC.81(70) to remove the applicability of the requirements to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water	2020	MSC	SSE				SSE 6/18, section 12

OUTPUTS TO REMAIN 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	Revision of SOLAS chapter III and the LSA Code to remove gaps, inconsistencies and	MSC	SSE		5	MSC 98/23, paragraph 20.41

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					
		technologies in the regulatory framework)	ambiguities based on the safety objectives, functional requirements and expected performance for SOLAS chapter III					
156	2018-2019	SD 6 (Ensure regulatory effectiveness)	Development of amendments to the LSA Code to revise the lowering speed of survival craft and rescue boats for cargo ships	MSC	SSE		2	MSC 99/22, paragraph 20.15
157	2018-2019	SD 6 (Ensure regulatory effectiveness)	Revision of the Code of safety for diving systems (resolution A.831(19)) and the Guidelines and specifications for hyperbaric evacuation systems (resolution A.692(17))	MSC	SSE		2	MSC 99/22, paragraph 20.26
158	2018-2019	SD 6 (Ensure regulatory effectiveness)	Amendments to SOLAS chapter III and chapter IV of the LSA Code to require the carriage of self-righting or canopied reversible liferafts for new ships	MSC	SSE		2	MSC 99/22, paragraphs 20.22 and 20.23

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					
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
162	2018-2019	OW	Development of amendments to SOLAS chapter II-1 to include requirements for water level detectors on non-bulk carrier cargo ships with multiple cargo holds	MSC	SSE	SDC	2	MSC 100/20, paragraph 17.3

ANNEX 11

PROPOSED PROVISIONAL AGENDA FOR SSE 7

- Opening of the session
- 1 Adoption of the agenda
 - 2 Decisions of other IMO bodies
 - 3 Develop new requirements for ventilation of survival crafts (OW 47)
 - 4 Consequential work related to the new International Code for Ships Operating in Polar Waters (OW 43)
 - 5 Revision of SOLAS chapter III and the LSA Code
 - 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 Safety objectives and functional requirements of the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III (2.5)
 - 11 Development of guidelines for cold ironing of ships and consideration of amendments to SOLAS chapters II-1 and II-2 (2.8)
 - 12 Amendments to paragraph 4.4.7.6.17 of the LSA Code concerning single fall and hook systems with on-load release capability (6.14)
 - 13 Revision of the Standardized Life-Saving Appliance Evaluation and Test Report Forms (MSC/Circ.980 and addenda) (1.27)
 - 14 Revision of the Code of safety for diving systems (resolution A.831(19)) and the Guidelines and specifications for hyperbaric evacuation systems (resolution A.692(17))
 - 15 Amendments to SOLAS chapter III, LSA code and resolution MSC.81(70) to remove the applicability of the requirements to launch free-fall lifeboats with the ship making headway at speeds up to 5 knots in calm water*
 - 16 Unified interpretation of provisions of IMO safety, security, and environment-related conventions (6.1)

* Subject to approval of the new output proposal by MSC 101.

- 17 Biennial status report and provisional agenda for SSE 8
- 18 Election of Chair and Vice-Chair for 2021
- 19 Any other business
- 20 Report to the Maritime Safety Committee

ANNEX 12

DRAFT AMENDMENTS TO THE REVISED RECOMMENDATION ON TESTING OF LIFE-SAVING APPLIANCES (RESOLUTION MSC.81(70), AS AMENDED)*

Part 1 – Prototype tests for life-saving appliances

8 LAUNCHING AND EMBARKATION APPLIANCES

8.1 Testing of davits and launching appliances

1 The fifth sentence of paragraph 8.1.1 is amended to read as follows:

"For free-fall lifeboats, the launching appliances for lowering a free-fall lifeboat by falls, except the winches ~~brakes~~, should be subjected to a static proof load of 2.2 times the maximum working load at the full outboard position."

* Amendments are shown as additions/deletions.

ANNEX 13

DRAFT MSC CIRCULAR

REVISED GUIDELINES FOR DEVELOPING OPERATION AND MAINTENANCE MANUALS FOR LIFEBOAT SYSTEMS¹

1 The Maritime Safety Committee, at its eighty-first session (10 to 19 May 2006), taking into account the number of casualties with lifeboat systems, further recognizing the need to improve manuals for operation and maintenance of lifeboat systems, and having considered proposals by the Sub-Committee on Fire Protection at its fiftieth session, approved the *Guidelines for developing operation and maintenance manuals for lifeboat systems* (MSC.1/Circ.1205), ~~as set out in the annex.~~

2 The Maritime Safety Committee, at its [101st session (5 to 14 June 2019)], approved amendments to the Guidelines as prepared by the Sub-Committee on Ship Systems and Equipment, at its sixth session (4 to 8 March 2019).

3 Member Governments are invited to bring the revised Guidelines, as set out in the annex, to the attention of all parties concerned with their application, as appropriate.

¹ Shaded strikeouts denote deleted text and shading highlights new or amended text.

ANNEX

REVISED GUIDELINES FOR DEVELOPING OPERATION AND MAINTENANCE MANUALS FOR LIFEBOAT SYSTEMS

1 Scope and purpose of the Guidelines

Seafarers often change ships and sometimes are not familiar with the lifeboats on their ships. Casualties with lifeboat systems are often caused by poor understanding of the lifeboat systems, especially release gear systems. User-friendliness of manuals for lifeboat systems is, therefore, important to help prevent casualties.

The purpose of these Guidelines is to encourage development of user-friendly manuals for operation and maintenance of lifeboat systems including launching appliances. These manuals should be easy to understand. The Guidelines demonstrate the appropriate level of detail and use of illustrations in explaining the safe use of critical systems. Manufacturers of lifeboats and launching/recovery appliances are invited to make manuals easy to understand, taking into account these guidelines. The use of video materials in conjunction with printed manuals can be an effective tool for mariners who may not be inclined to read a manual.

These Guidelines are not applicable to the emergency instructions required by SOLAS regulation III/8, operating instructions such as posters and signs required by SOLAS regulation III/9 or other brief instructions for operation of lifeboats.

These guidelines are for manuals to be carried on ships for use by seafarers, and accordingly the section on weekly and monthly inspection and maintenance does not refer to detailed maintenance/repair work. Detailed maintenance/repair work should be conducted by the manufacturer's representative or a person appropriately trained and certified by the manufacturer for the work in accordance with MSC.1/Circ.1206.

2 Collaboration of manufacturers of the lifeboat and the launching appliance

A manual for a lifeboat system including launching appliance should be developed with the collaboration of manufacturers of the lifeboat and the launching appliance and preferably be a single document. As a minimum, the use of different words for the same gear/parts of the lifeboat system should be eliminated by the collaboration of manufacturers of the lifeboat and the launching appliance to prevent misunderstanding by seafarers. Hereafter, these guidelines assume a manual for a lifeboat system includes the launching appliance as a minimum, but separate lifeboat, release gear, and launching appliance manuals may be effective if adequately coordinated and using the same style of presentation per these guidelines.

3 Contents of a manual for a lifeboat system

3.1 *Items to be included*

An operation and maintenance manual for a lifeboat system should include, as a minimum, the following items:

- .1 overview and specification of the lifeboat system;
- .2 explanation of the structure and working principle of the major parts of the lifeboat system including release gear systems;
- .3 operation of the lifeboat system; and
- .4 routine inspection and maintenance of the lifeboat system.

3.2 *Organization, description and layout of manual*

3.2.1 *Outline*

It is recommended that a manual for a lifeboat system be developed with the following major divisions:

- 1 General description of the whole lifeboat system.
- 2 Method of checking proper closure of release hooks.
- 3 Launching operation.
- 4 Recovery operation.
- 5 On-load/off-load release gear.
- 6 Inspection and maintenance.

3.2.2 *Explanation of major components and their function*

The structure and working principle of the lifeboat's major components, in particular the on-load/off-load release gear, should be explained using figures and preferably three-dimensional perspectives. In addition, the operation of the release gear should be described sequentially, using short phrases written in the active voice.

3.2.3 *Operation of lifeboat system including release gear systems*

The operation of the lifeboat system should be described using the following elements:

- .1 flow of the operation should be explained;
- .2 detail of operation should be explained with figures. Operation and relevant movement of the parts of the release gear should be described with illustrations/photos, preferably using annotations and arrows to show direction of movement; and
- .3 hazards, precautions and notes should be identified with symbols specific to the level of risk. As an example of the various levels of risk and the appropriate associated symbols, the following are recommended:
 - .1 For the highest level of risk, such as in the explanation of "on-load release operation", the following symbol (red background) should be used with a warning statement similar to the following:



Warning

This operation releases the lifeboat and may result in the lifeboat dropping and causing death or serious injury if released too soon.

Note: International standard symbols (ISO 3864-1 and ISO 7010) and the signs and markings depicted in resolution A.1116(30) are recommended where appropriate, but since marine use is excluded from the scope of these standards, and they fail to indicate different levels of risk, the "graduated" symbols of paragraph 3.2.3.3 are recommended.

- .2 For the second highest level of risk, such as in the explanation of "davit arm stop release operation", the following symbol (yellow background) should be used with a caution statement similar to the following:



Caution

Incorrect or incomplete resetting may cause the lifeboat to drop resulting in death or serious injury.

- .3 For less critical mandatory instructions the following symbol (blue background) should be used with appropriate instruction:



Mandatory

Place the manual gripe out of the way to prevent tangling round the lifeboat.

...

- .4 Important notes may be emphasized with symbol and style of instructions similar to the following:



Note

In case the hook is not released by the above operations, confirm condition of each hook and whether the boat is waterborne or not. Even though the hooks cannot be released by the above mentioned off-load release operation, the on-load release procedure, described in the following pages, is possible.

- .5 Prohibited actions should use the following symbol (coloured red) and style of instruction:



Never

Never enter lifeboat without ensuring complete closure of release hooks. Incomplete resetting of the release hooks can cause the lifeboat to drop and may result in the death of occupants.

Note: International standard symbols (ISO 3864-1 and ISO 7010) and the signs and markings depicted in resolution A.1116(30) are recommended where

appropriate, but since these standards, and they fail to indicate different levels of risk, the "graduated" symbols of paragraph 3.2.3.3 are recommended.

3.2.4 *Inspection and maintenance*

The items for weekly and monthly inspection/maintenance and other inspection/maintenance should each be explained separately.

4 **Improvement of user-friendliness of a manual**

4.1 ***Use of figures/photographs***

Figures, preferably coloured, or photographs should be used as far as practicable to make manuals easy to understand.

4.2 ***Use of standard wording***

The following standard wording should be used to explain lifeboat systems where provided, and for each of the applicable items illustrations should be provided to show the items and their location in the lifeboat or on the ship. The use of alternative terms for variety should be avoided, except to further define or clarify a term so that the reader never has to guess what item or system is being discussed.

.1 Davit/winch:

- .1 Auto releasing gripe
- .2 Davit arm
- .3 Davit arm stop
- .4 Davit remote control wire handle
- .5 Frame
- .6 Maintenance (hanging off) pennant attachment points, if provided
- .7 Manual gripe, if provided
- .8 Remote control wire
- .9 Winch manual brake safety pin
- .10 Winch hand crank handle
- .11 Winch centrifugal or lowering brake
- .12 Winch hand brake or stop brake lever

.2 Freefall:

- .1 Roller or sliding pad
- .2 Sea lashing rope
- .3 Emergency release device

.3 Release gear:

- .1 Hook control cable
- .2 Hook retainer (lock piece)
- .3 Hydrostatic interlock
- .4 Hydrostatic interlock lever, if provided
- .5 Interlock ("mechanical protection" of on-load release)
- .6 Maintenance (hanging off) pennant attachment points, if provided
- .7 On-load release
- .8 Release handle
- .9 Release handle "closed (locked)" and "open" positions
- .10 Release handle "safety pin"
- .11 Release hook (hook unit) (fore and aft hooks)

- .12 Reset lever, if provided
- .13 Safety latch (keeper)
- .4 Suspension:
 - .1 Foul weather recovery strops
 - .2 Suspension block
 - .3 Suspension link (lifting ring)
- .5 "Officer in charge" of lifeboat

5 Example of an operation and maintenance manual for a lifeboat system

An example of an operation and maintenance manual for a fire-protected lifeboat system is attached in the following pages just for reference. It demonstrates the suitable level of detail that should be expected for manuals. It should be noted that lifeboat systems are different from each other and some specifications in the example manual are not applicable to lifeboat systems of other types. The example attached at appendix is a model manual which is recommended as an example for developing specific manuals for lifeboat systems launched by falls, but the same general principles should be used for manuals for freefall lifeboat systems.

APPENDIX

EXAMPLE OPERATION AND MAINTENANCE MANUAL FOR A LIFEBOAT SYSTEM²

Table of contents

1	General
2	Method of checking proper closure of release hooks
3	Launching operation
3.1	Preparation before launching
3.2	Setting painter
3.3	Release of safety pin for winch hand brake lever
3.4	Release of davit arm stop
3.5	Boarding the lifeboat
3.6	Launching procedure
3.7	Release gear operation
3.8	Painter release and lifeboat operation
4	Recovery operation
4.1	Resetting procedure of release hook
4.2	Recovery procedure
4.3	Stowage procedure
5	On-load/off-load release gear system
5.1	General
5.2	Fore and aft hook units
5.3	Release handle unit
5.4	Hydrostatic interlock unit
6	Inspection and maintenance
6.1	General precautions
6.2	Inspection and maintenance of lifeboat and release gear system
6.3	Inspection and maintenance of launching appliances (davits and winches)

² Of a lifeboat being launched using falls and a winch, hereinafter referred to as a lifeboat.

1 General

The lifeboats are stored on the boat davits on both sides of the ship. In case of emergency, the crew can board the lifeboat and escape ~~ed~~ with the lifeboat directly from its stowage position.

The launching appliance consists of a boat davit (davit arm, frame, platform, falls, suspension block, and gripes/lashing device) and a boat winch (reduction gears, hand brake and centrifugal brake).

Swinging out and lowering of the lifeboat can be controlled both from the inside of the lifeboat and at the ship's deck. The lowering speed of the lifeboat can be controlled by operating the remote control wire inside the lifeboat or by operating the remote control lever on the ship's deck. Moreover, it is possible to suspend the lowering operation of the lifeboat at any height.

Recovery of the lifeboat is performed by operating the boat winch with the push-button switch box. When the davit arm reaches a prescribed position, the boat winch is automatically stopped by the limit switch. After the activation of the limit switch, the boat winch is operated manually to wind up the lifeboat to its stowage position. The boat winch is provided with a safety device to prevent the reverse operation of the manual handle.

The lifeboat is equipped with on-load/off-load release gear which complies with the requirements of the IMO Life-Saving Appliance (LSA) Code. The release gear system is equipped with a hydrostatic interlock system so that it will normally not release the hooks until the boat is waterborne.

To avoid possible injury or death, read this manual carefully before using the boat davit, the boat winch, and the on-load/off-load release gear.

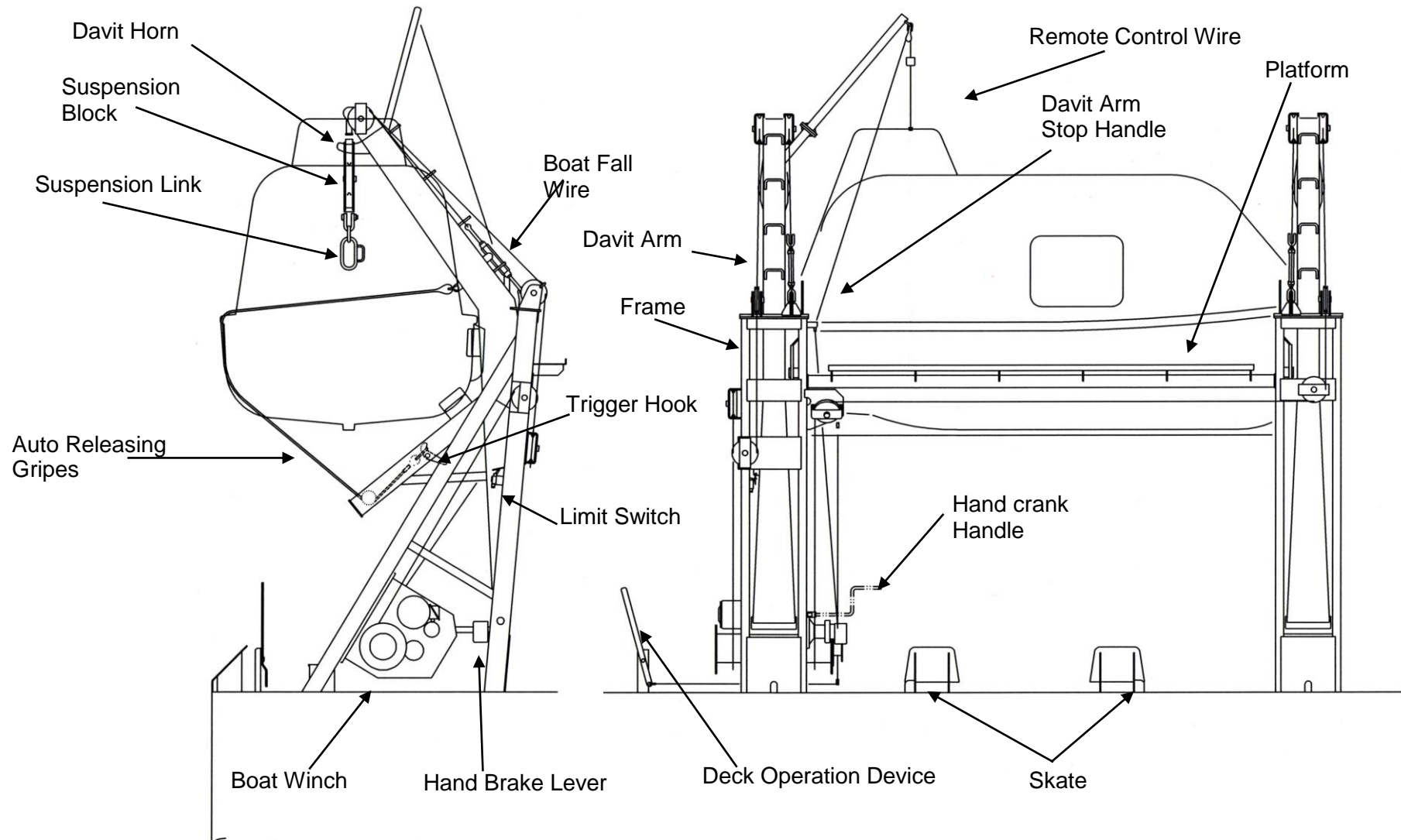


Figure 1.1 Lifeboat davit arrangement

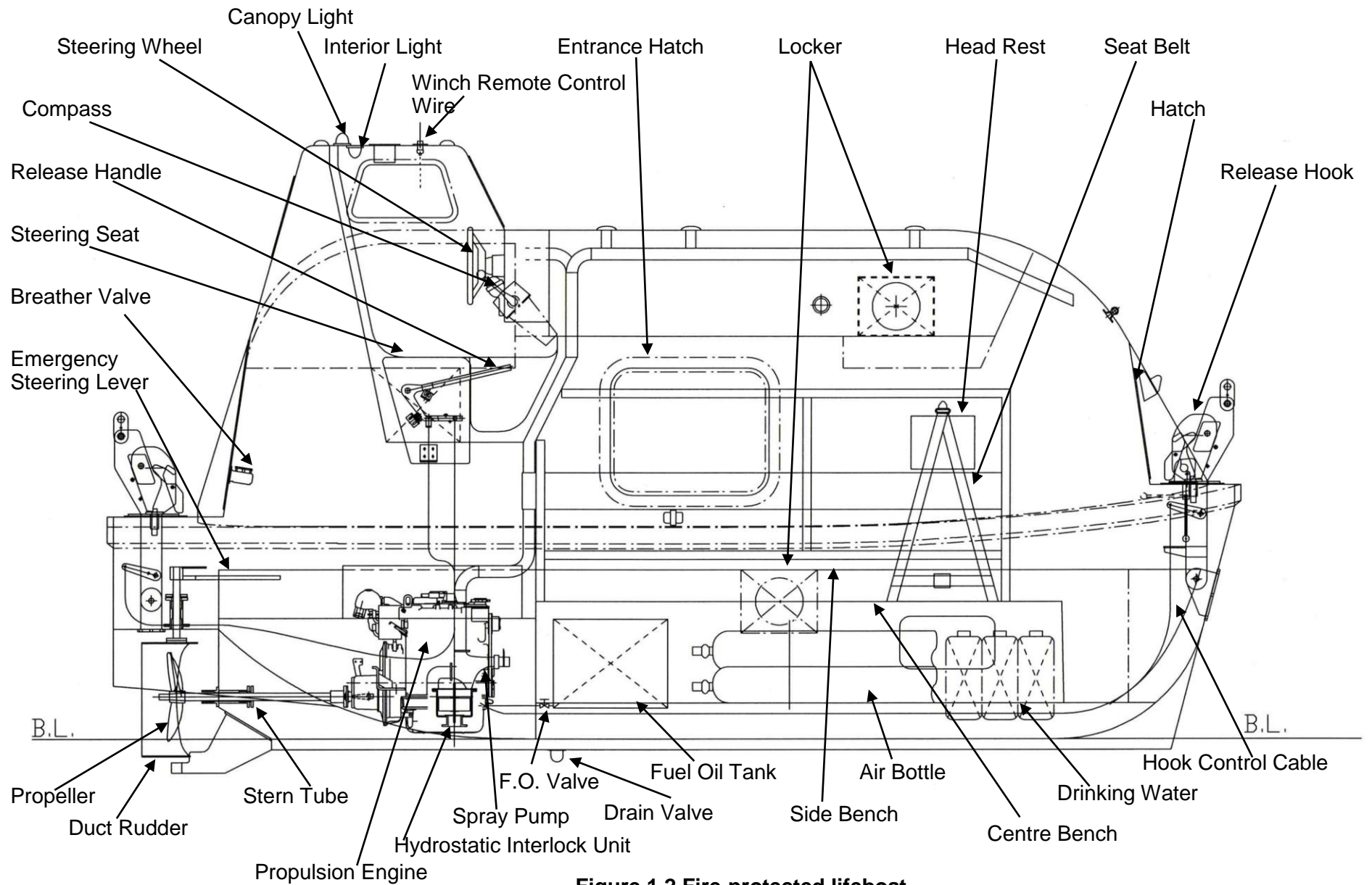
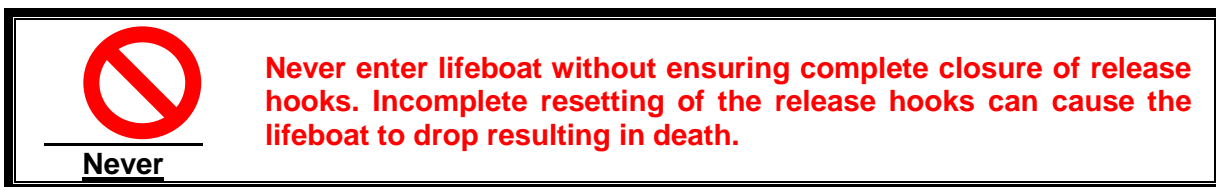


Figure 1.2 Fire-protected lifeboat

2 Method of checking proper closure of release hooks

2.1 Safe use and operation of lifeboats during drills and inspection and maintenance is dependent on knowing that the release gear is properly reset.



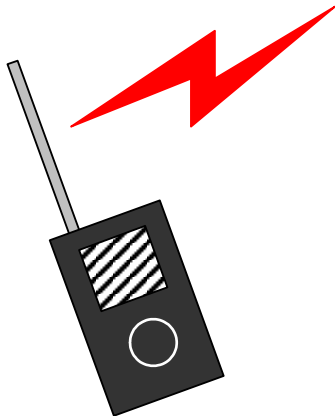
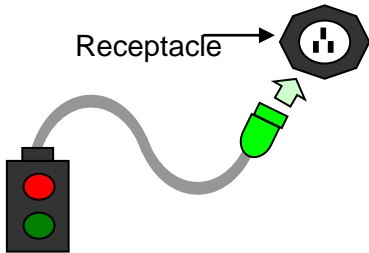

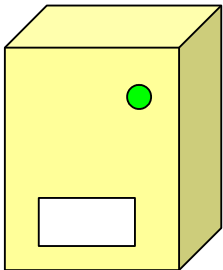

2.2 Purpose of on-load release. The IMO LSA Code requires, among other things, that the lifeboat be fitted with "**on-load release capability which will release the lifeboat with a load on the hooks. The release mechanism shall be so designed that crew members in the lifeboat can clearly observe when the release mechanism is properly and completely reset and ready for lifting.** . . ." On-load release is needed for launching when there is a current, when the ship is making way, or potentially if there are waves which cause the hydrostatic interlock to only release intermittently. On-load release also allows an empty or fully loaded boat to drop from any height, which can kill or seriously injure the occupants. Therefore it is critical to know that the release gear is properly reset and the release handle secured.

2.3 Ensuring release hook closure. The first thing to check whenever entering the lifeboat when it is (or will be) supported by the falls is properly reset as follows:

No.	Operation Guide	Schematic Diagram
1	<p>Check that the reset lever on each hook is horizontal and in contact with its stop.</p> <p><Activity in the lifeboat></p>	
2	<p>Check that the release handle is in the closed (locked) position and safety pin is installed.</p> <p><Activity in the lifeboat></p>	

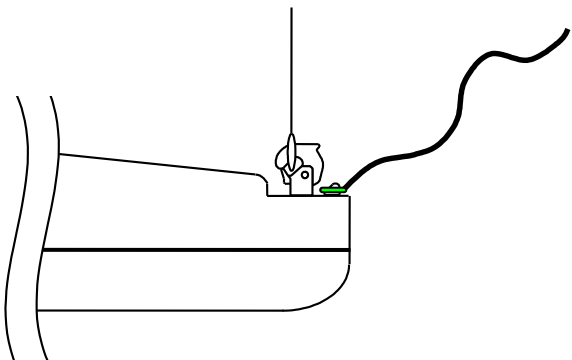
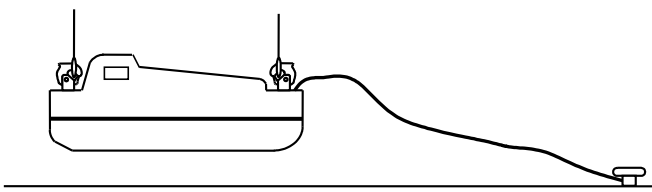
3 Launching operation

3.1 Preparation before launching

No.	Operation Guide	Schematic Diagram
1	<p>Prepare transceivers, and confirm the communication condition.</p> <p><Activity on the ship></p>	
2	<p><In case of drill></p> <p>Connect the push-button switch for recovering to the receptacle.</p> <p><Activity on the ship></p>	
3	<p><In case of drill></p> <p>Turn on the power switch of start panel.</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;">  <p>Detach the cable for the storage battery charge.</p> </div> <p><Activity on the ship></p>	
4	<p>Don life jackets.</p> <p><Activity on the ship></p>	

³ The grey cross sign indicates deletion and the grey border indicates insertion throughout the text.

3.2 Setting of painter


No.	Operation Guide	Schematic Diagram
1	<p>Confirm the connection of the painter on the painter release device of the lifeboat.</p> <p><Activity on the lifeboat></p>	
2	<p>Confirm the connection of the painter as far forward as practicable inboard of the falls but outboard of everything else.</p> <p><Activity on the ship></p>	

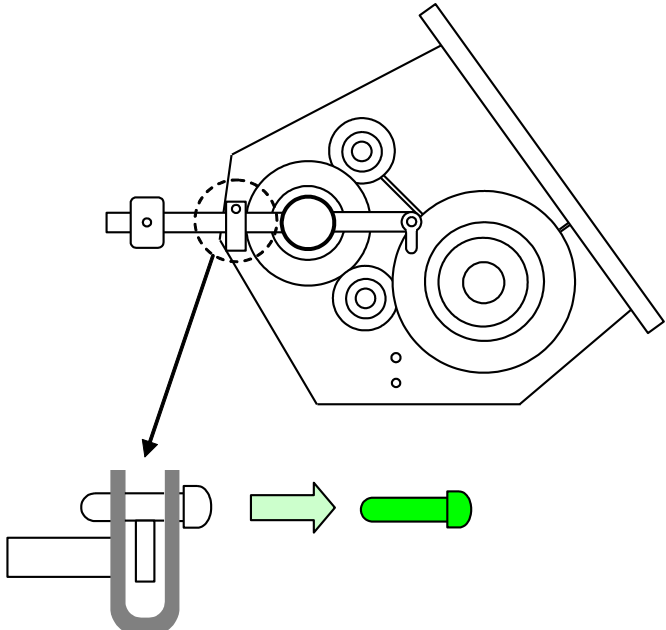


Caution

Ensure the painter is lead as far forward as practicable inboard of the lifeboat falls but outboard of everything else. Failure to do so will result in severe difficulties clearing the vessel during abandonment.

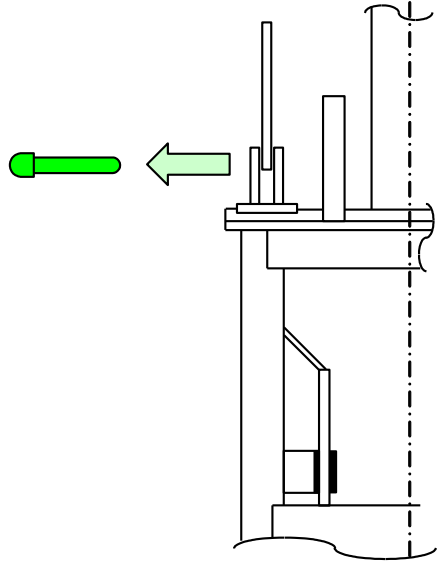
3.3 Release of safety pin (if fitted) for winch hand brake lever

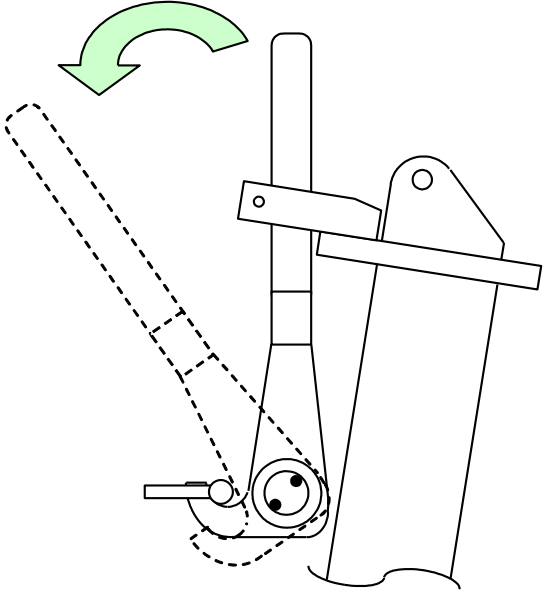
 <p>Caution</p>	<p>The safety pin of the winch hand brake should not be pulled out until the completion of the preparation described in paragraphs 3.1 and 3.2.</p>
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No.	Operation Guide	Schematic Diagram
1	<p>Pull out the safety pin (if fitted).</p> <p><Activity on the ship></p>	

3.4 Release of davit arm stopper

Go up to the platform of the davit system (platform for boarding the lifeboat).

No.	Operation Guide	Schematic Diagram
1	<p>Wind the boat fall manually to take off the slack. Pull out the safety pin of the davit arm stop, if fitted.</p> <p><Activity on the ship></p> <p>Note: Safety pins are generally intended only for use during maintenance or in port.</p>	

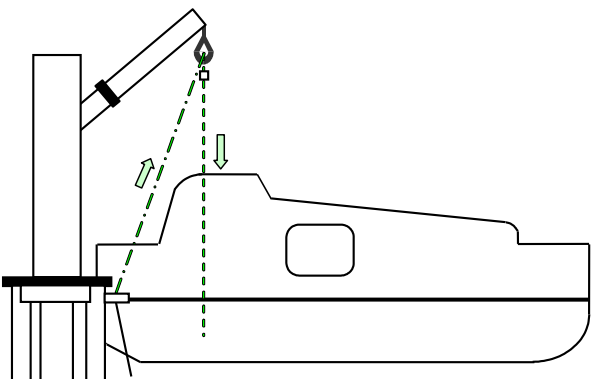
No.	Operation Guide	Schematic Diagram
2	<p>Release the davit arm stop by operating the handle.</p> <p><Activity on the ship></p>	

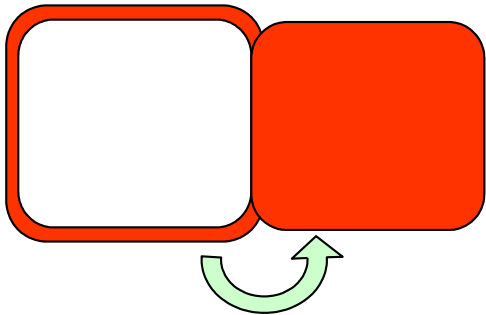
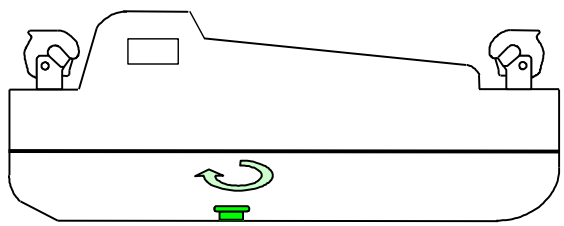
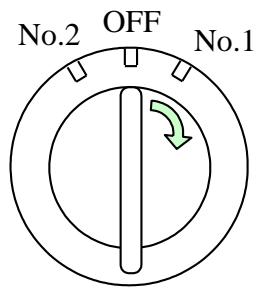
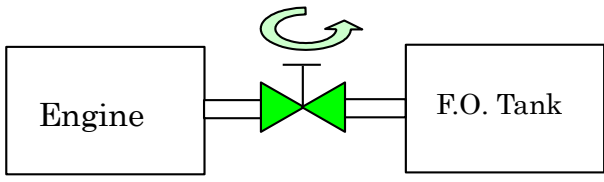
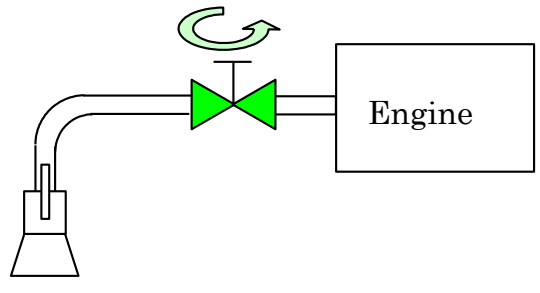


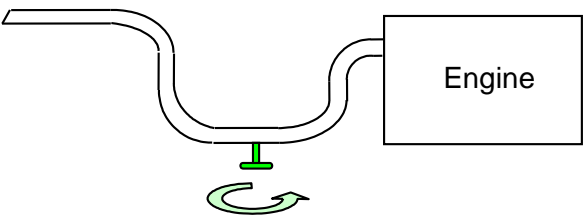
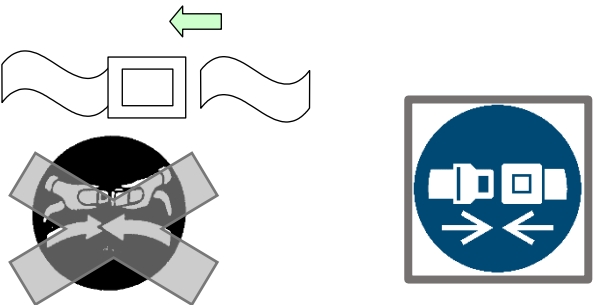
Caution

The handle should be fully operated to prevent the davit arm stop from being caught with the lock device.

3.5 Boarding the lifeboat

No.	Operation Guide	Schematic Diagram
1	<p>Confirm that the remote control wire is drawn into the lifeboat.</p> <p><Activity on the ship></p>	

No.	Operation Guide	Schematic Diagram
2	<p>Open the lifeboat boarding door and board the lifeboat.</p> <p><Activity on the ship> and <Activity in the lifeboat></p>	
3	<p>Ensure the bottom plug is fitted and tight.</p> <p><Activity in the lifeboat></p>	
4	<p>Turn on the power supply switch.</p> <p><Activity in the lifeboat></p>	
5	<p>Open the fuel oil valve.</p> <p><Activity in the lifeboat></p>	
6	<p>Confirm that the cooling seawater valve is open.</p> <p><Activity in the lifeboat></p>	

No.	Operation Guide	Schematic Diagram
7	Close the drain valve on exhaust pipe. <Activity in the lifeboat>	
8	Fasten seatbelt. <Activity in the lifeboat>	



Caution

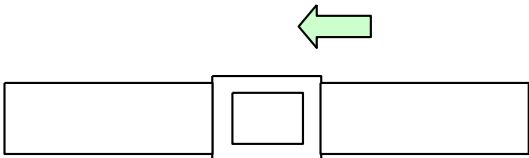
Seating positions of persons should be carefully selected to maintain a good trim of the lifeboat.

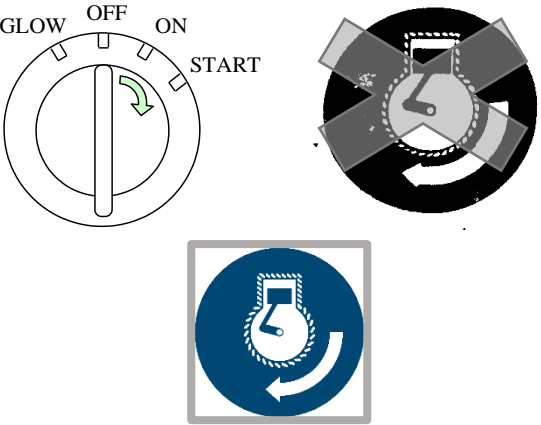
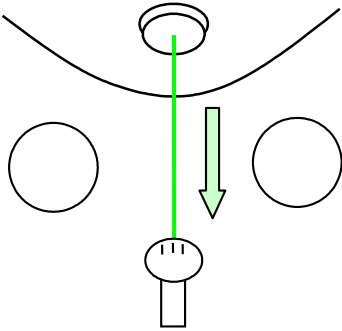


Warning

If the seat belt is not fastened, serious injury or death may occur.

3.6 Launching procedure

No.	Operation Guide	Schematic Diagram
1	Confirm that all crew boarded in the lifeboat are seated and their seatbelts are fastened. <Activity in the lifeboat>	

No.	Operation Guide	Schematic Diagram
2	<p>Start engine.</p> <p><Activity in the lifeboat></p>	
3	<p>Pull down the winch remote control wire.</p> <p><Activity in the lifeboat></p>	



Caution

- Ensure that no gripe or lashing is tangled around the fore and aft hooks.
- Pull down the remote control wire gently and slowly during swinging out of the lifeboat.
- Only pull down the remote control wire fully to lower the boat after swing out is complete.
- The helmsman must tell the crew to standby for splashdown when the lifeboat reaches the vicinity of the water surface.



Warning

- When using remote control gear from within the boat never wind the cord or wire around fingers, hand or wrist as this may result in the cutting off of fingers/hand.
- Do not stop the swinging out operation at deck position. Stopping shakes the lifeboat and may cause casualties.
- A rapid swing out may cause dangerous impact on the boat when the davit arm reaches the deck position.
- Inching operation shakes the lifeboat and is dangerous.



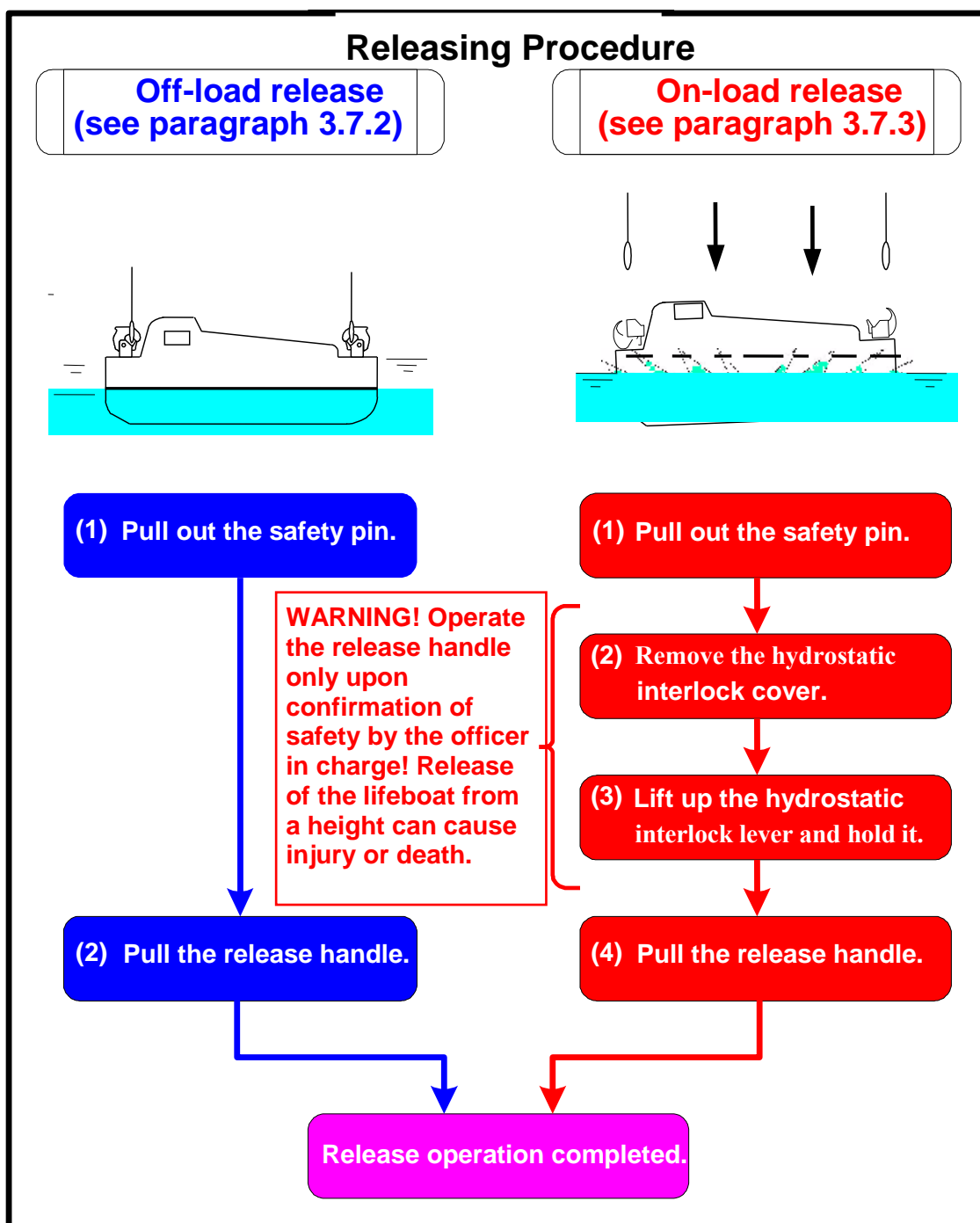
Note

During lifeboat drills, the above mentioned procedures may not be applicable because the lowering operation may be controlled from the ship's deck using the deck operation device.

3.7 Release gear operation

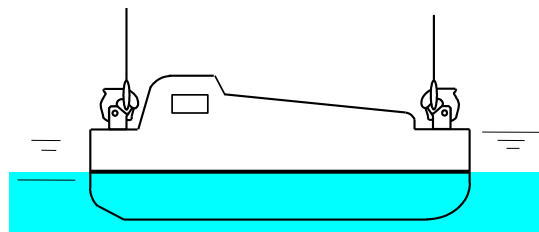
3.7.1 Releasing procedure

A flow chart of the off-load and on-load releasing procedures is shown in the following figure.



3.7.2 Off-load release

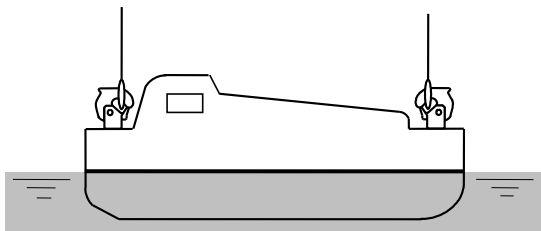
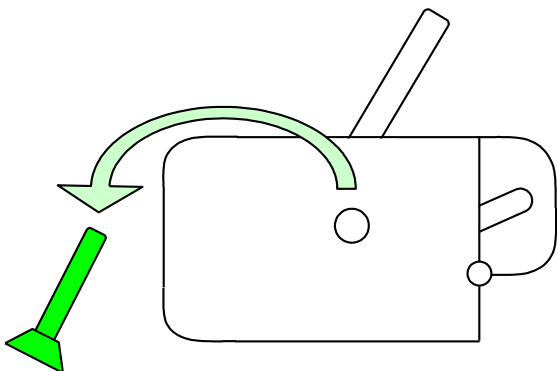
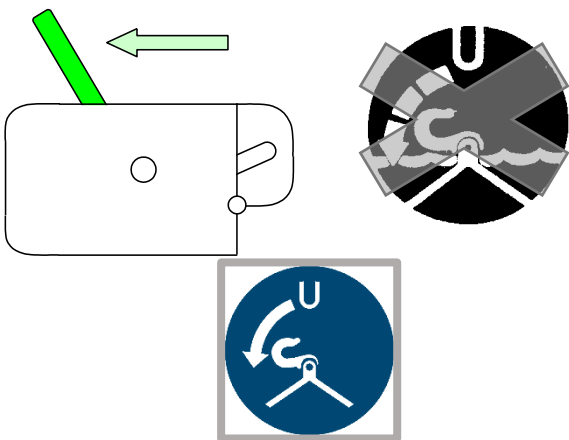
This operation is the normal method of launch and release and is conducted when the lifeboat is fully waterborne.




Caution

Confirm the following before the operation:

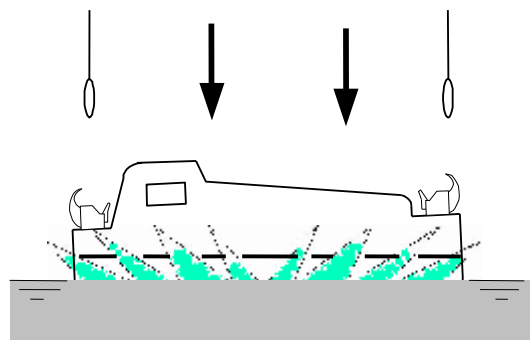
- The lifeboat is fully waterborne.
- The engine is started.
- All crew are in their seats with their seatbelts fastened.


No.	Operation Guide	Schematic Diagram
1	Confirm that the lifeboat is waterborne. <Activity in the lifeboat>	
2	Pull out the release handle safety pin. <Activity in the lifeboat>	
3	Pull the release handle to the fully open position by one action. <Activity in the lifeboat>	

No.	Operation Guide	Schematic Diagram
 Note	<p>In a case where the hook is not released by the above operations, confirm condition of each hook and whether the boat is waterborne or not. Even though the hooks cannot be released by the off-load release operation described above, on-load release procedure, described in the following pages, is possible.</p>	


3.7.3 On-load release

This operation is conducted when the lifeboat is not fully waterborne.



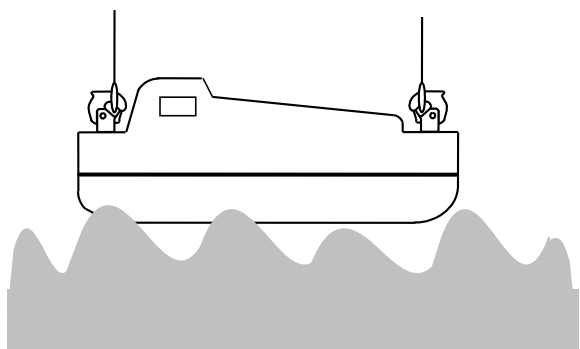

Warning

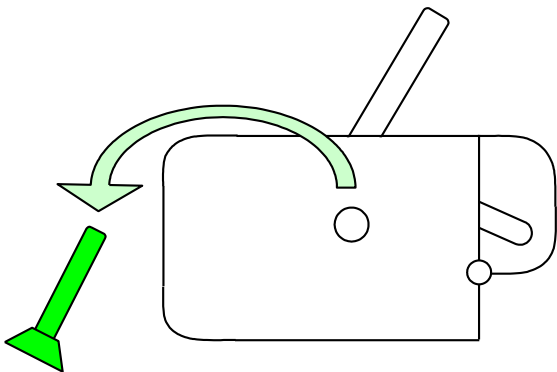


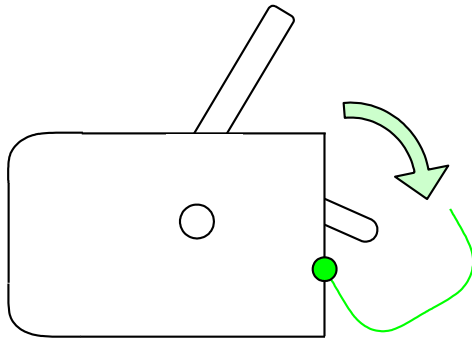

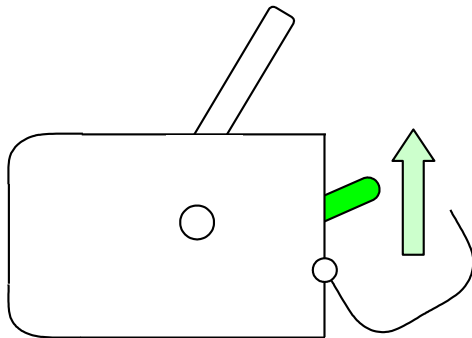
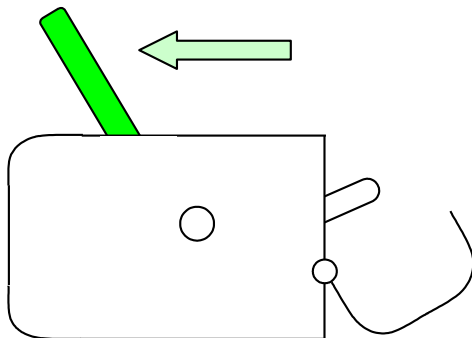
- Pay due precautions and conduct the on-load release operation in accordance with orders of the officer in charge.
- Operation of the release handle upon insufficient confirmation of safety may result in death or injury due to dropping the lifeboat in the water from a height.


Caution

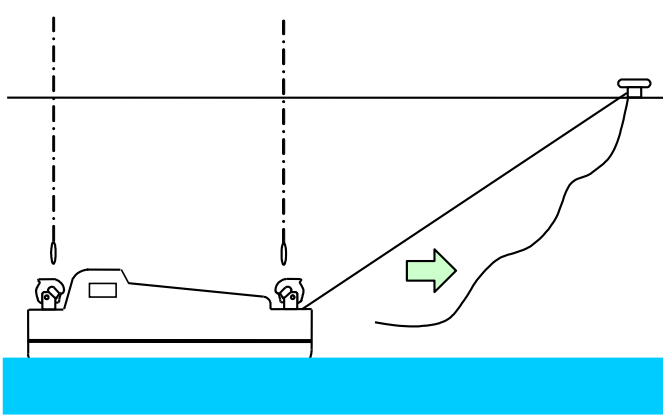
Confirm the following before the operation.

- The lifeboat is as close as possible to the water surface.
- The engine is started.
- All crew are in their seats with their seatbelts fastened.

No.	Operation Guide	Schematic Diagram
1	<p>Confirm that the lifeboat is as close as possible to the water surface, but that the hydrostatic interlock is not triggered.</p> <p><Activity in the lifeboat></p>	

No.	Operation Guide	Schematic Diagram		
2	<p>Pull out the release handle safety pin.</p> <p><Activity in the lifeboat></p>			
3	<table><tr><td></td><td>Unlock the latch of the interlock cover.</td></tr></table> <p><Activity in the lifeboat></p>		Unlock the latch of the interlock cover.	
	Unlock the latch of the interlock cover.			
4	<p>Lift the hydrostatic interlock lever fully and hold it.</p> <p><Activity in the lifeboat></p>			
5	<p>Pull the release handle to the fully open position by one action.</p> <p><Activity in the lifeboat></p>			

3.8 Painter release and lifeboat operation

No.	Operation Guide	Schematic Diagram
1	<p>Release the painter.</p> <p><Activity in the lifeboat></p>	
2	<p>Lifeboat operation</p> <p>Ahead, astern, turning, spray, lighting of interior light and canopy light, and other performances.</p> <p><Activity in the lifeboat></p>	

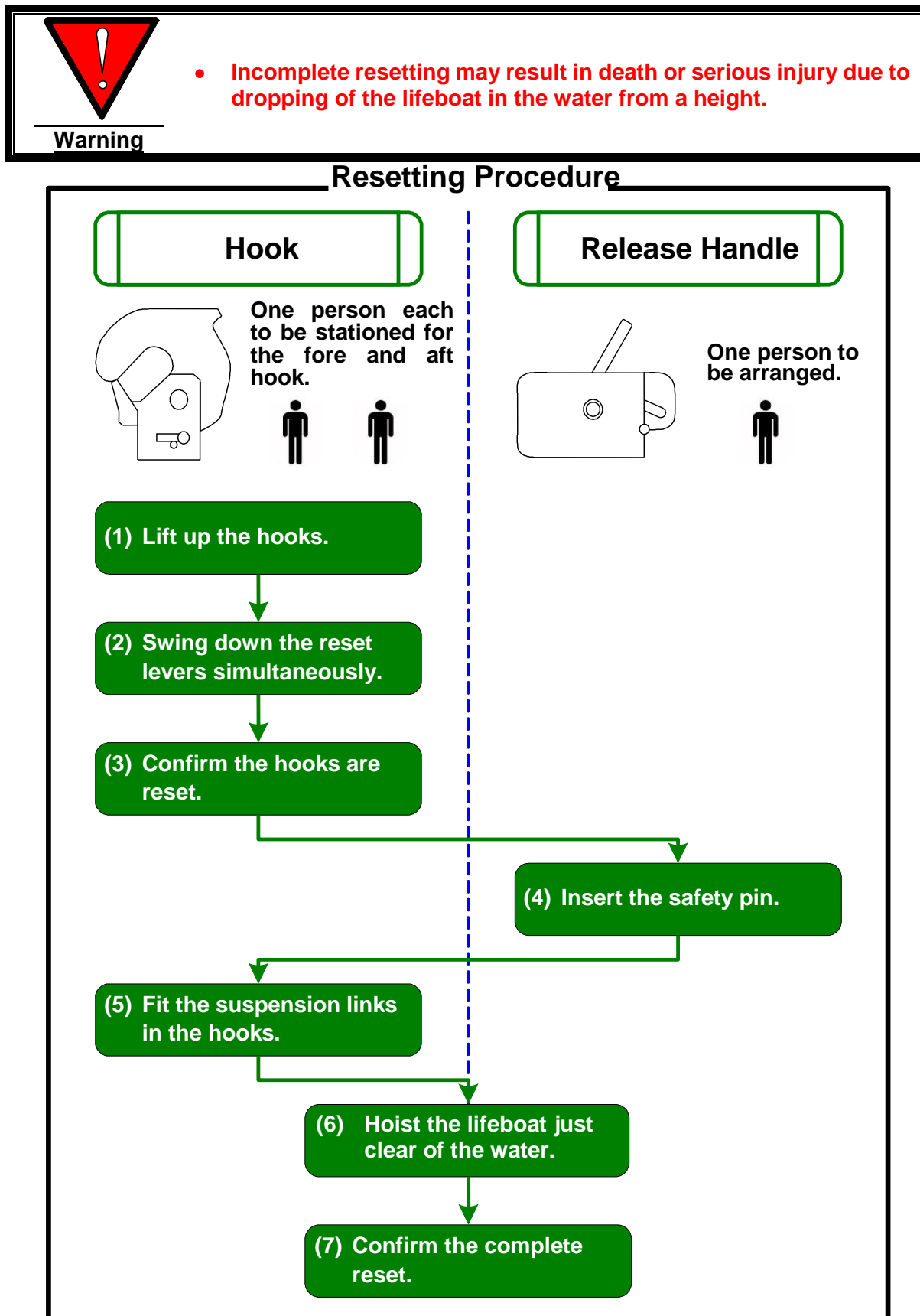


Caution

- Do not operate the steering gear to turn the lifeboat while the painter is connected.
- The lifeboat should get clear of the ship promptly when the painter has been released.

4 Recovery operation


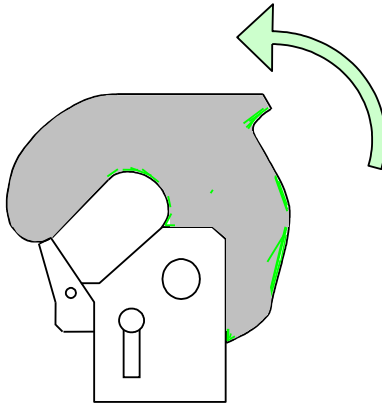

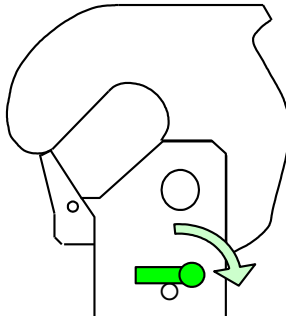

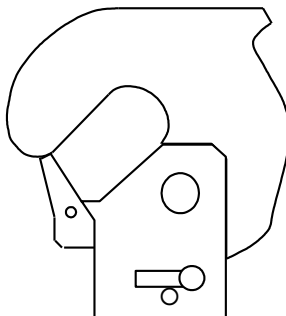
Outline of the resetting procedures is shown in the following figure.


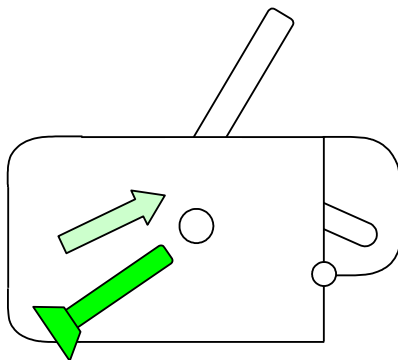


4.1 Resetting procedure of release hook

The resetting procedure is to be in accordance with the following steps.


 Note	At least three people are required for the resetting of the hooks.
--	--

No.	Operation Guide	Schematic Diagram
1	<p>Lift the fore and aft hooks and hold them closed.</p> <div>  <div> A strong effort may be required to lift the hook and force the internal lock piece to engage. </div> </div> <p><Activity in the lifeboat></p>	
2	<p>Simultaneously swing down the reset levers on both fore and aft hooks in one continuous action to contact with the stop.</p> <div>  <div> The release handle returns to its closed (locked) position automatically when the reset levers are swung down. </div> </div> <p><Activity in the lifeboat></p>	
3	<p>Confirm the fore and aft hooks are in the normal reset positions.</p> <div>  <div> Make sure that the reset lever is in contact with the stop. </div> </div> <p><Activity in the lifeboat></p>	

No.	Operation Guide	Schematic Diagram
4	<p>Make sure that the release handle is in the closed (locked) position and insert the safety pin.</p> <div>  <p>If the release handle is not in its closed (locked) position, it is not possible to insert the safety pin.</p> </div> <p><Activity in the lifeboat></p>	

4.2 Recovery procedure

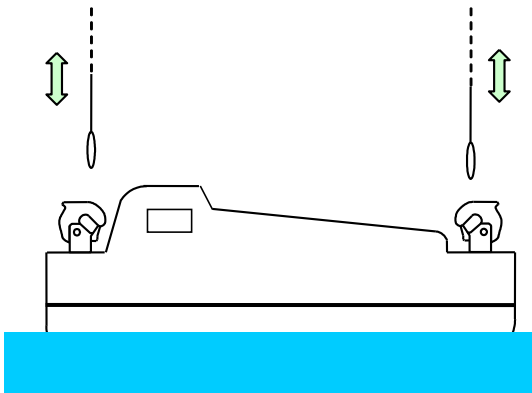
The recovery procedure is to be in accordance with the following steps only after completing the release gear resetting.

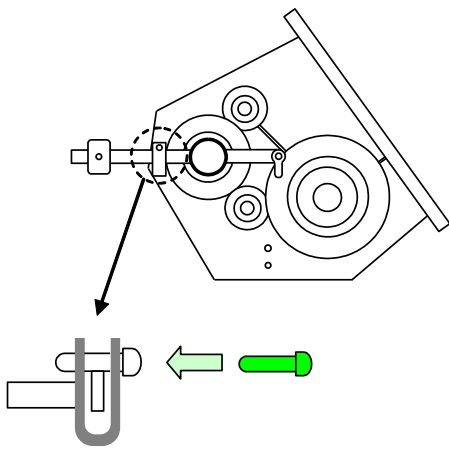
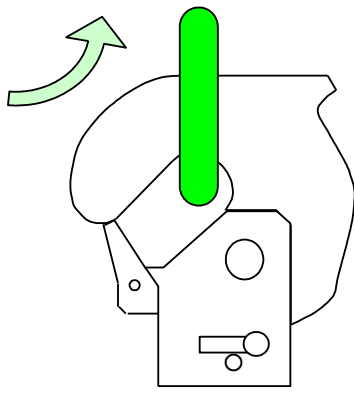


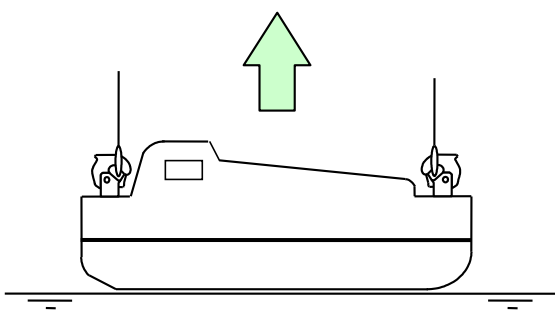

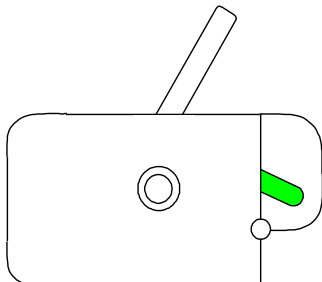


- **Great care must be exercised in reconnecting the hooks that hands and fingers are kept clear.**
- **Failure to confirm proper resetting or to follow all steps below may result in death or serious injury due to dropping the lifeboat in water from a height.**


Warning

4.2.1 Connection of the suspension link

No.	Operation Guide	Schematic Diagram
1	Manoeuvre the lifeboat to come under boat falls.	
2	<p>Adjust the heights of the suspension links by raising or lowering the boat falls.</p> <p><Activity on the ship> and <Activity in the lifeboat> under good communication.</p>	


No.	Operation Guide	Schematic Diagram		
3	<p>Insert the safety pin of the boat winch handbrake.</p> <p><Activity on the ship></p>			
4	<p>Connect the suspension links of the davit simultaneously to both, fore and aft hooks.</p> <p><Activity in the lifeboat></p>			
5	<table border="1"><tr><td></td><td>Confirm that the fore and aft hooks are properly connected.</td></tr></table> <p><Activity on the ship> and <Activity in the lifeboat></p>		Confirm that the fore and aft hooks are properly connected.	
	Confirm that the fore and aft hooks are properly connected.			
6	<p>Confirm that the hydrostatic interlock lever has moved to the "locked" position for the lifeboat not being waterborne.</p> <p><Activity in the lifeboat></p>			
7	Where the resetting is incomplete, return to the first step.			

Do not conduct recovery operation of the lifeboat unless the above procedures are fully completed.



Caution

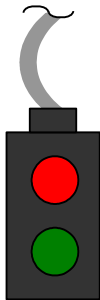
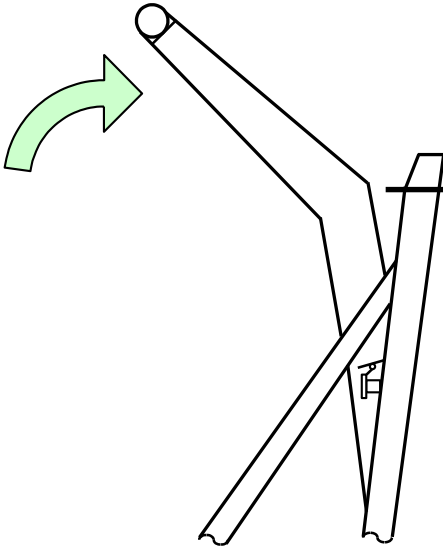
- ✓ Do not connect the suspension link of the davit to the hooks until reset of the hooks has been fully completed. It is dangerous to connect the suspension link during the resetting operation of the hook and results an incomplete reset.
- ✓ In case of using recovery strops, it is required to connect the bottom link of the strops instead of the suspension link to the hooks.



Warning

- ✓ Both hooks should be connected simultaneously to prevent damage due to excessive load on one hook.
- ✓ If only one hook is connected, the lifeboat may be suspended by the single hook due to wave action resulting in injury or death.

4.2.2 Hoisting the lifeboat

No.	Operation Guide	Schematic Diagram
1	<p>Hoist the lifeboat by operating the winch using the push-button switch following the instruction by the officer in charge.</p> <p><Activity on the ship></p>	
2	<p>Hoist the lifeboat until the winch is stopped by the limit switch.</p> <p><Activity on the ship></p>	



Caution

- The boat winch stops automatically when the davit arm strikes the limit switch.
- Where the limit switch of boat winch does not work correctly, the winch operator should manually stop the hoisting operation immediately.

No.	Operation Guide	Schematic Diagram
3	Disembark from the lifeboat. <Activity on the ship> and <Activity in the lifeboat>	

4.3 Stowage procedure



Note

Position **two persons** on davit platform to watch for proper stowage.

No.	Operation Guide	Schematic Diagram
1	Hoist the davit arm manually. <Activity on the ship>	
2	Confirm that the davit arm is in contact with the stop on platform. <Activity on the ship>	



Caution

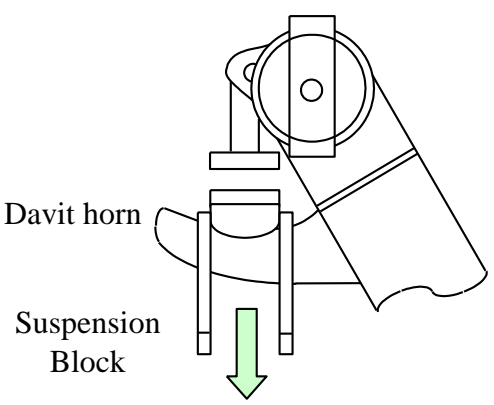
- Each person on the platform should signal to the winch operator just when the davit arm reaches the stop on the frame.
- Confirm that the davit arm and the stops are in contact fore and aft.




Warning

- Stop the hoisting operation immediately when the signal from the watchman is received.
- Over hoisting by manual operation may have serious consequences due to damage of the boat fall and the davit.

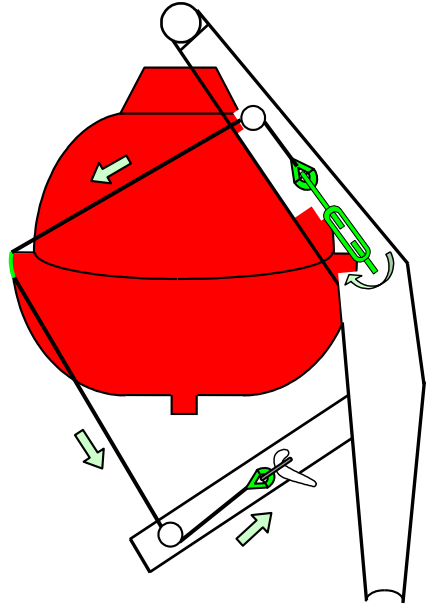
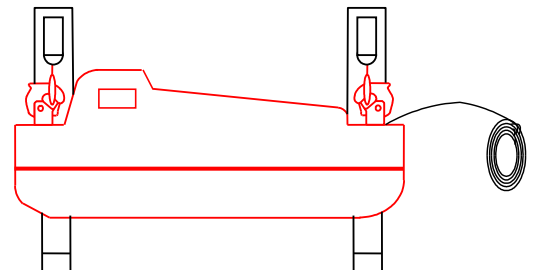
No.	Operation Guide	Schematic Diagram
3	<p>Detach the manual hoisting handle.</p> <p><Activity on the ship></p>	
4	<p>Set the davit arm stop immediately.</p> <p><Activity on the ship></p>	
5	<p>Insert the safety pin to the davit arm stop handle.</p> <p><Activity on the ship></p> <p>Note: Safety pins are generally intended only for use during maintenance or in port.</p>	

No.	Operation Guide	Schematic Diagram
6	<p>Lower the suspension block on the davit horn by releasing the handbrake of the winch.</p> <p><Activity on the ship></p>	 <p>Davit horn</p> <p>Suspension Block</p>



- If the suspension blocks are not on the davit horn, the boat falls remain in tension during sea going and the load may cause damage to the boat falls.**

Warning

No.	Operation Guide	Schematic Diagram
7	<p>Install and tighten the auto release gripe, if fitted.</p>	
	<p>✓ Tighten the auto release gripe rope with the turnbuckle.</p> <p><Activity on the ship></p>	
8	<p>Connect the painter to the painter release hook on the bow of lifeboat.</p> <p><Activity on the ship></p>	

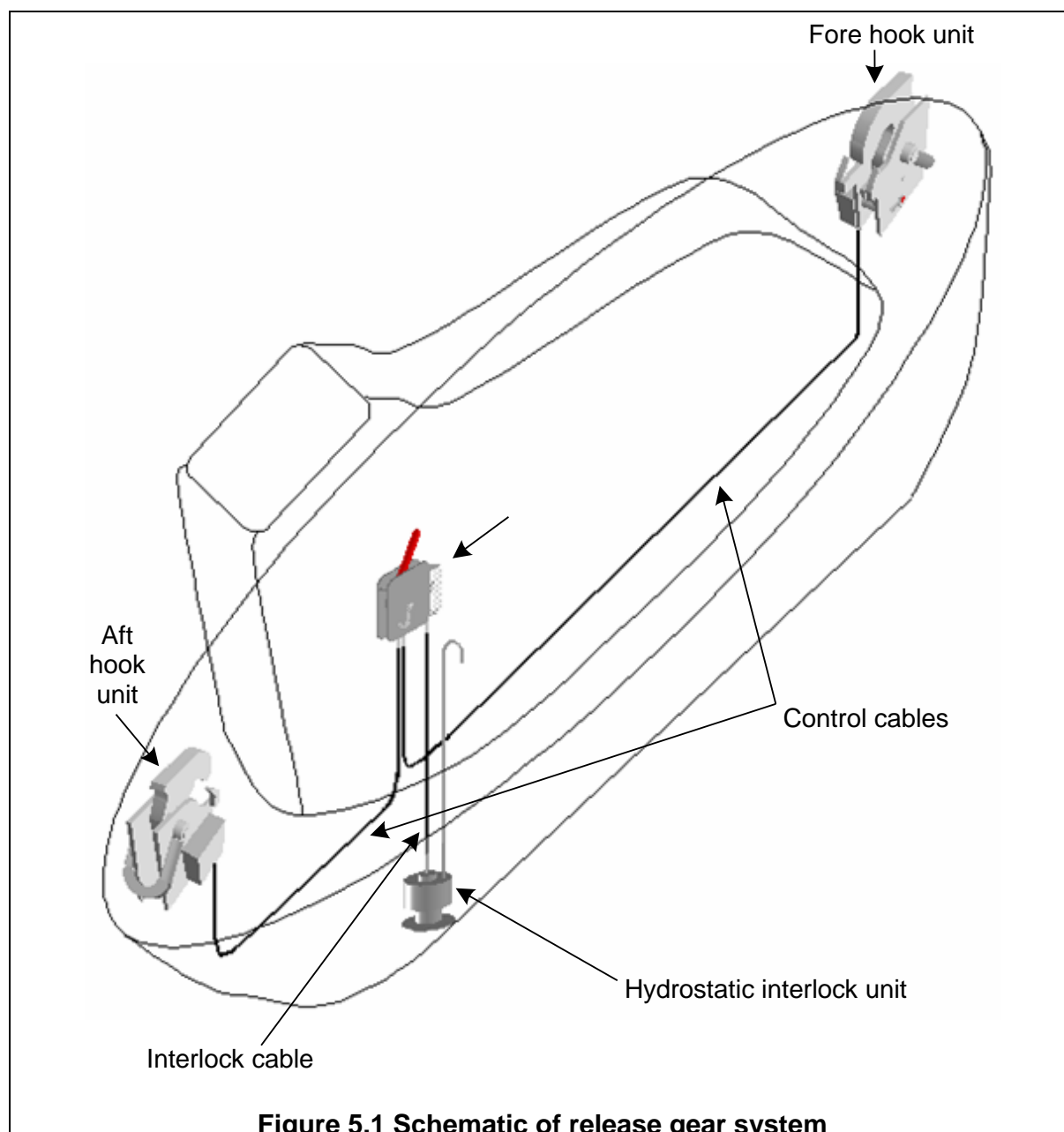
5 On-load/off-load release gear system

5.1 General

This section describes the details of the release gear system. Read this section carefully for safe operation. This release gear system consists of fore and aft hooks, a release handle near the steering console, a hydrostatic unit and the associated cables (see figure 5.1).

The releasing operation of the hooks is conducted at the release handle near the steering console through the control cables terminating at the fore and aft hooks. The interlock system including the hydrostatic interlock unit is provided to prevent the release of the hooks when the boat is not waterborne.

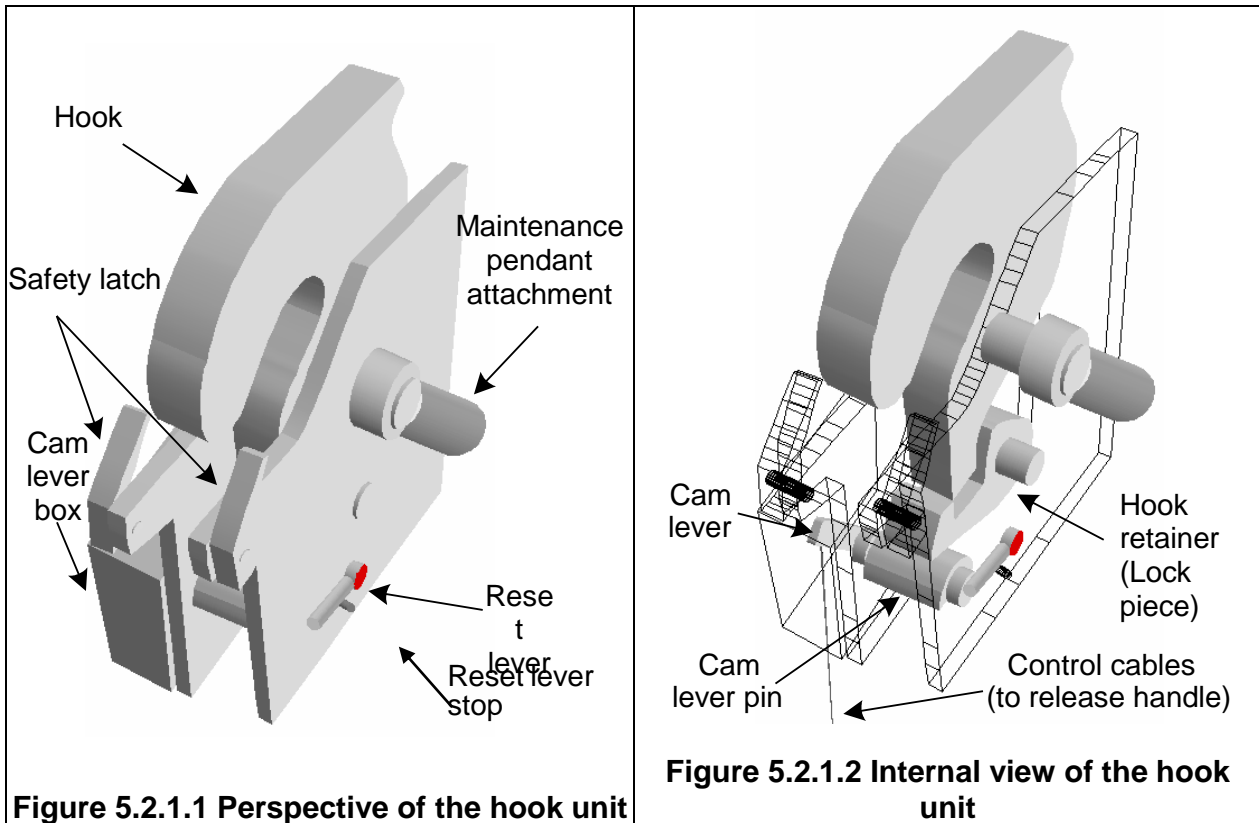
The system also has an on-load release function which makes it possible to over-ride the interlock by the hydrostatic unit. Incorrect on-load release operation may cause fatalities and due precautions should be taken for this operation.



5.2 Fore and aft hook units

5.2.1 Structure and parts names

The structure and parts names of the fore and aft hooks are shown in figures 5.2.1.1 and 5.2.1.2. The fore and aft hooks are generally identical except for the direction of installation.



5.2.2 Releasing

When the release handle near the steering console is pulled, the cam lever pin is turned by the control cable and the lock piece is then made free. Finally the hook is turned and released (see figure 5.2.2).

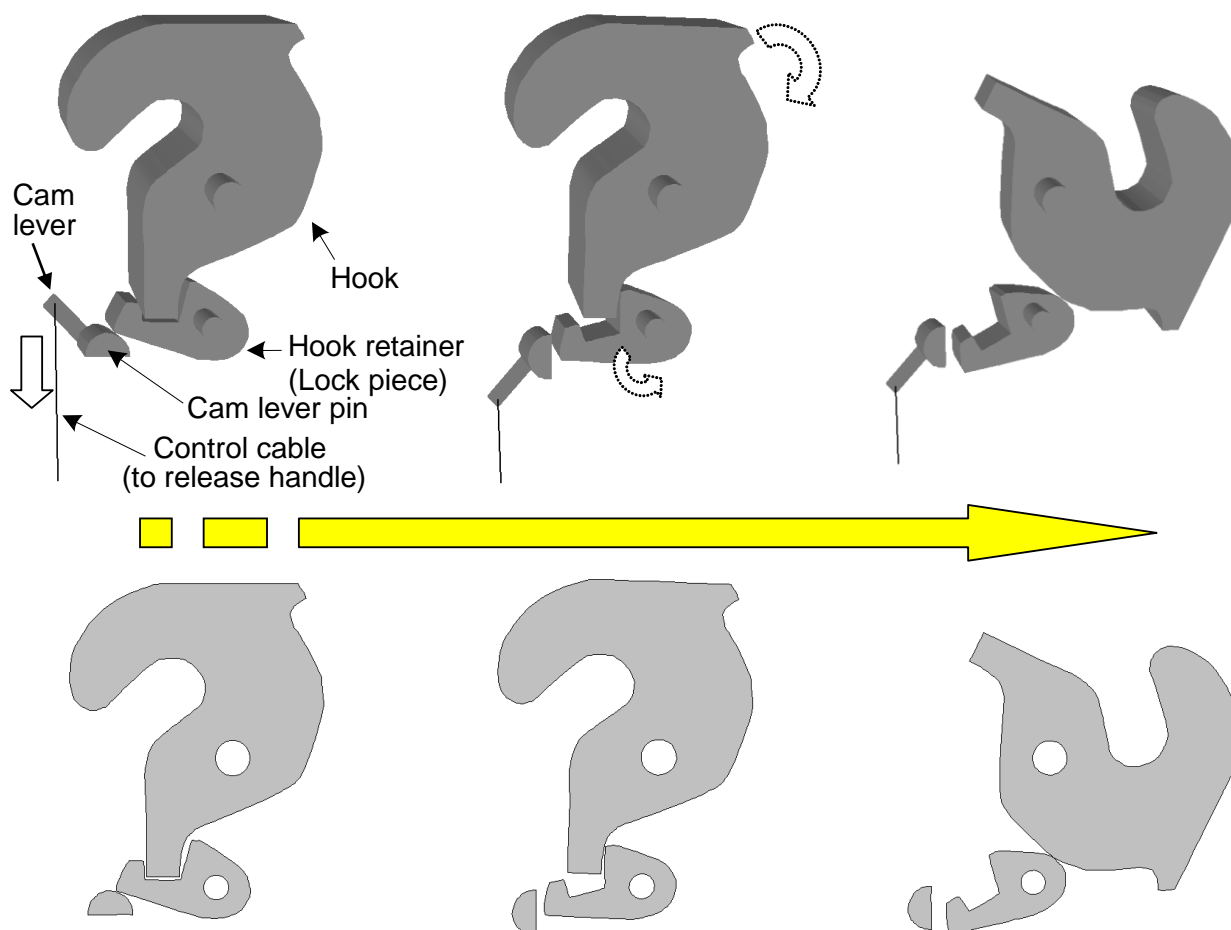


Figure 5.2.2 Release principle of the hook unit

5.2.3 Resetting

After the resetting of hooks, the posture of each hook is held by the lock piece and the lock piece is locked by the cam lever pin with the reset lever. To ensure the proper resetting of the fore and aft hooks, the procedures described in paragraph 4.1 should be followed. The fore and aft reset levers must be operated simultaneously. After simultaneous resetting of the hooks, the release handle near the steering console also returns to the closed position (see figure 5.2.3).

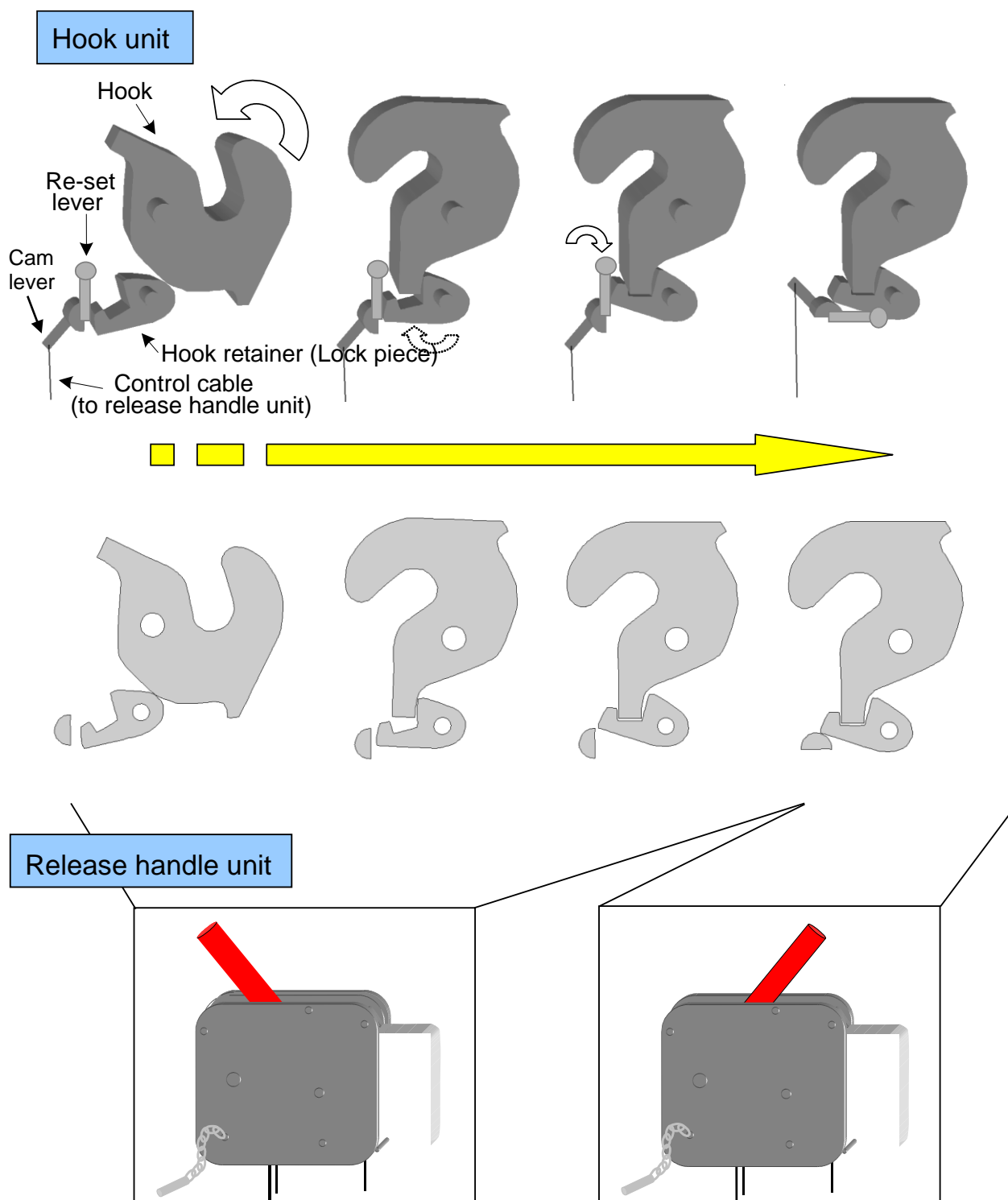
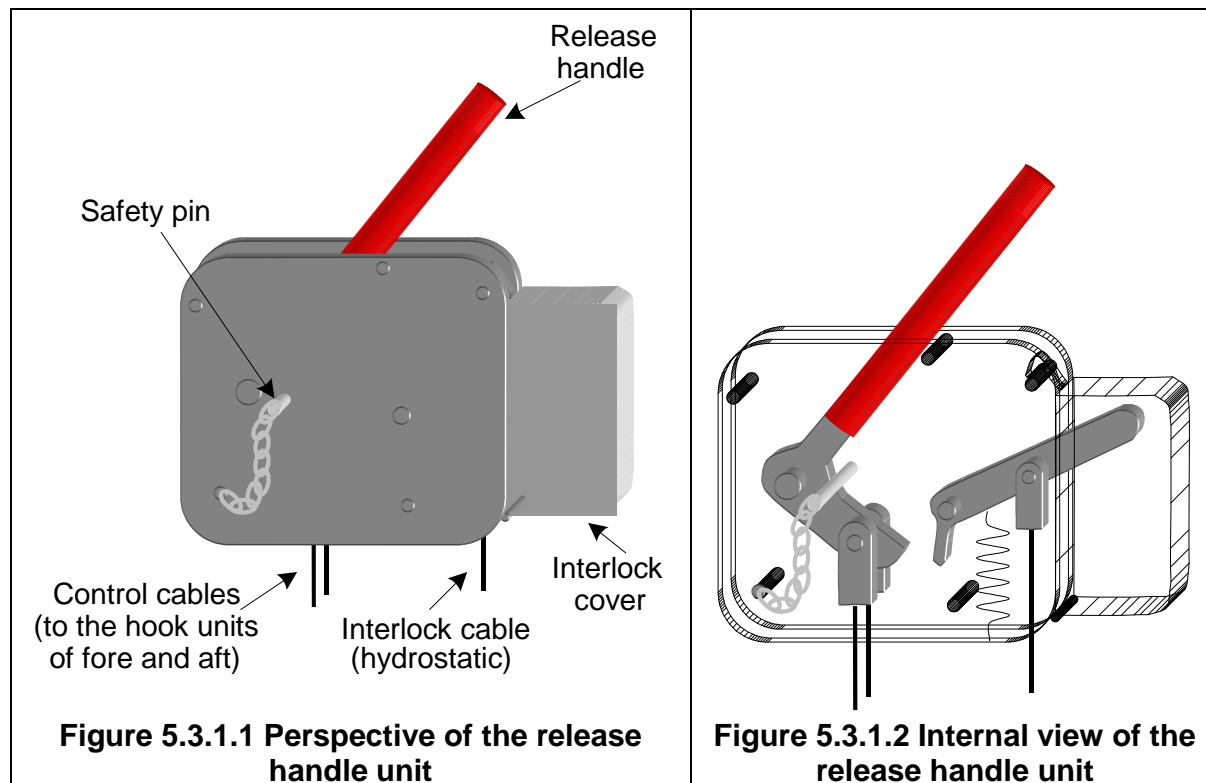


Figure 5.2.3 Reset principle of the hook unit

5.3 Release handle unit

5.3.1 Structure and parts names

The structure and parts names of the release handle are shown in figures 5.3.1.1 and 5.3.1.2.



5.3.2 Operation

When the lifeboat is fully waterborne, the lifeboat can be released by removing the safety pin and then pulling the release handle fully and quickly to the open position (off-load release). The lifeboat can also be released by the same operation of the release handle even though the lifeboat is not fully waterborne, by opening the interlock cover and lifting up the interlock lever. This over-rides the interlock function of the hydrostatic interlock unit (on-load release).

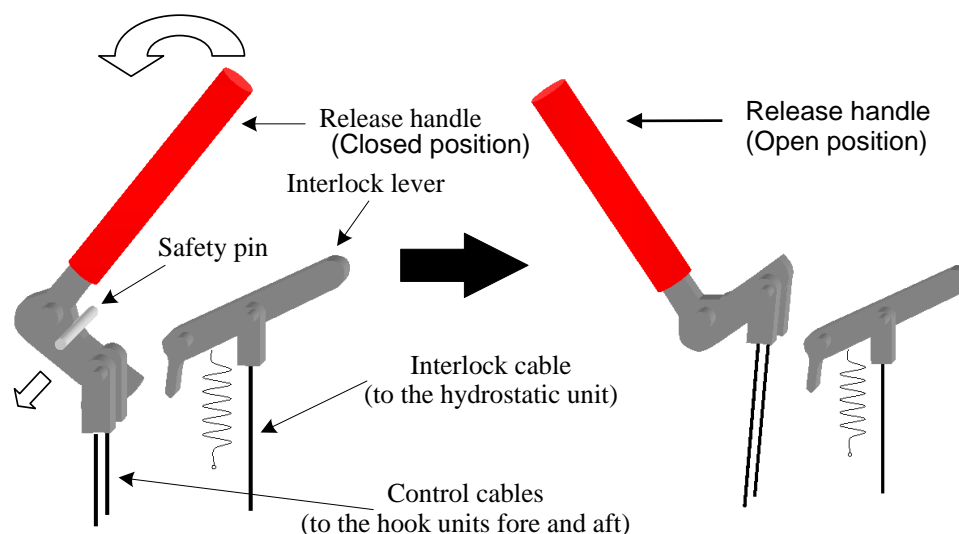
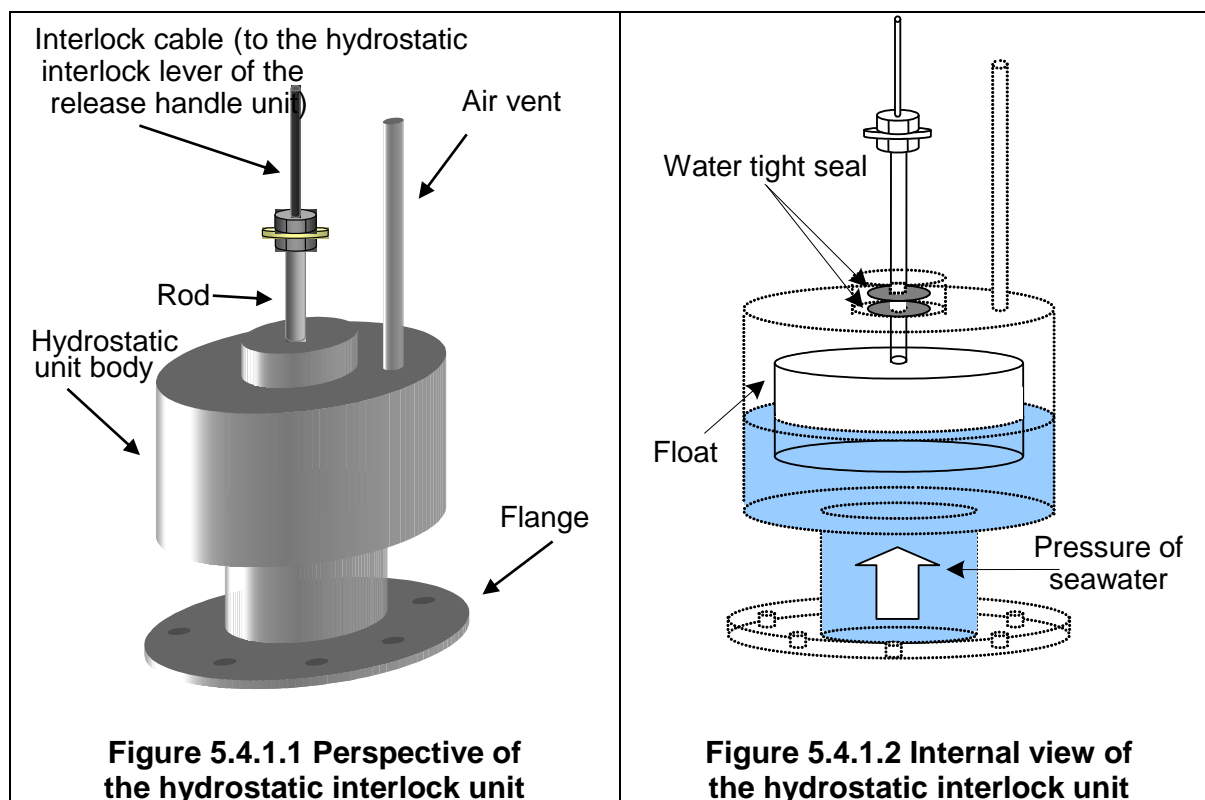


Figure 5.3.2 Operation procedure of the release handle

5.4 Hydrostatic interlock unit

5.4.1 Structure and parts name

Structure and parts names of the hydrostatic interlock unit are shown in figures 5.4.1.1 and 5.4.1.2.



5.4.2 Operation

When the lifeboat is fully waterborne, the hydrostatic interlock unit pushes up the interlock lever through the interlock cable by the water lifting the float and thus allowing the release handle to be operated. Contrary to this, operation of the release handle is not allowed by the hydrostatic interlock unit when the lifeboat is not fully waterborne.

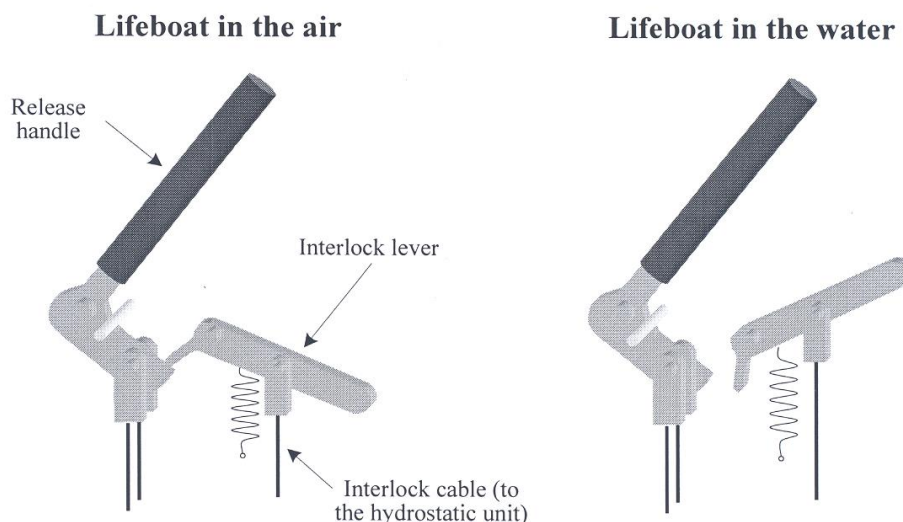


Fig. 5.4.2 Schematic diagram of the interlock

6 Inspection and maintenance

6.1 General precautions

SOLAS regulation III/20 requires that all life-saving appliances shall be in working order and ready for immediate use before the ship leaves port and at all times during the voyage. Lifeboats, launching appliances and release gear are required by SOLAS regulation III/20 to be inspected weekly and monthly according to the instructions for on-board maintenance complying with the requirements of SOLAS regulation III/36. Also, MSC.1/Circ.1206 describes more detailed procedures for periodic servicing and maintenance of lifeboats, launching appliances and release gear.

This manual includes only the weekly and monthly inspection and maintenance, which are conducted on board under the direct supervision of a senior ship's officer.

6.2 Inspection and maintenance of lifeboat and release gear system

6.2.1 Inspection and maintenance plan

Lifeboats should be inspected and maintained weekly and monthly in accordance with the following tables. The tables list the items to be checked, the method of inspection, the procedures to be followed, and the frequency at which the items are to be attended to.

Table 6.2.1.1 covers the basic lifeboat (including release gear).

Table 6.2.1.2 covers the lifeboat engine.

Table 6.2.1.3 covers the electric parts.

Table 6.2.1.4 covers the lifeboat equipment.

Table 6.2.1.1 – Inspection procedure and maintenance plan for boat

Items		Method	Inspection procedure	Maintenance plan	
				Weekly	Monthly
Outside hull		Visual	Inspect for deformation or other defects. Inspect for peeling or any damage of retro-reflective material.	X	X
Outside canopy		Visual	Inspect for deformation or other defects.	X	X
Buoyant lifeline		Visual	Inspect for any damage.	X	X
Foldable canopy* ¹		Visual	Inspect for any damage to canopy.	X	X
Inside boat	GRP	Visual	Inspect for deformation or other defects.	X	X
	Wood	Visual	Inspect for crack or rot.	X	X
	Metal	Visual	Inspect for corrosion.	X	X
Drain valve		Visual	Inspect for any damage.	X	X
Release gear		Visual	Check resetting condition. Remove any dirt on moving parts.	X	X
Painter release device		Visual	Check resetting condition. Remove any dirt on moving parts.	X	X
All hatches		Visual Operation	Inspect for easy operation and good condition of gasket.	X	X
Window		Visual	Inspect for any crack on glass. Clean both sides of glass.		X
Steering gear		Visual	Inspect for any damage of rudder, tiller and emergency tiller.	X	X
		Operation	Inspect for good operation of main steering and connecting emergency tiller.	X	X
Stern tube		Visual	Inspect gasket and check for leakage of seawater.	*2	*2
Propeller and guard		Visual	Inspect for any damage.	X	X
Breather valve		Operation	Inspect operation of valve.		X
Water spray system	Clutch V-belt	Visual	Inspect for proper tension of V-belt. Inspect for any damage of belt.		X
		Operation	Inspect for proper operation.		X
	Spray pipe	Visual	Inspect for corrosion or any damage.		X
	Spray nozzle	Visual	Remove any deposit.		X
Air support system	High pressure pipe	Visual	Inspect for any damage.		X
	Regulator	Visual	Inspect for any damage.		X
	Air cylinder	Visual	Inspect for corrosion or any damage.		X

Note: 1 Applicable only to partially enclosed lifeboats.
2 When waterborne.

Table 6.2.1.2 – Inspection procedure and maintenance plan for engine

Items	Method	Inspection procedure	Maintenance plan	
			Weekly	Monthly
Engine	Visual	Check in good condition.		X
	Operation	Start and operate the engine. Check operation of throttle. Check operation of clutch.	X	X
Lubricating oil	Visual	Check an amount of oil.		X
	Visual	Check viscosity of oil with finger and ensure it's not dirty.		X
Fuel oil tank	Visual	Check securing condition of the tank (corrosion or leakage and connecting parts). Check an amount of fuel oil.		X
Fuel oil pipe	Visual	Check any leakage on connecting parts.		X
Water cooler	Visual	Check an amount of fresh water.		X
Cooling water pipe	Visual	Check any leakage on pipe.		X
Starter switch	Operation	Check operating properly.	X	X
Glow lamp	Operation	Check light on when pre-heating.	X	X
Tachometer	Operation	Check proper indication of revolution.	X	X
Oil pressure warning lamp, Charge lamp	Operation	Check proper light on or light off condition.	X	X
Stop wire	Operation	Stop the engine.	X	X

Table 6.2.1.3 - Inspection procedure and maintenance plan for electric parts

Items	Method	Inspection procedure	Maintenance plan	
			Weekly	Monthly
Battery	Visual	Check lead wire.		X
	Measure	Measure voltage of battery. When voltage is low, charge battery.		X
Inside lamp	Operation	Check light on.		X
Canopy lamp	Operation	Check light on.		X
Search light	Operation	Check light on.		X
Electric wiring	Visual	Check any defects on wiring.		X

Table 6.2.1.4 – Inspection procedure and maintenance plan for lifeboat equipment

Check for condition, quantity and expiry date where applicable

No.	Items	Maintenance plan	
		Weekly	Monthly
1	Oars		X
2	Thole pins or crutches		X
3	Boat hooks		X
4	Buoyant bailer		X
5	Buckets		X
6	Survival manual	X	X
7	Compass		X
8	Sea-anchor		X
9	Painters		X
10	Hatchets		X
11	Watertight receptacle and fresh water		X
12	Dipper with lanyard		X
13	Graduated drinking vessel		X
14	Food ration in watertight container		X
15	Rocket parachute flare		X
16	Hand flare		X
17	Buoyant smoke signal		X
18	Waterproof electric torch		X
19	One daylight signalling mirror		X
20	One copy of life-saving signals	X	X
21	One whistle		X
22	A first-aid kit		X
23	Anti-seasickness medicine		X
24	One seasickness bag for each person		X
25	A jack knife		X
26	Three tin openers		X
27	Two buoyant rescue quoits		X
28	A manual pump	X	X
29	One set of fishing tackle		X
30	Portable fire-extinguishing equipment		X
31	A radar reflector		X
32	Thermal protective aids		X
33	Compartments for storage		X
34	A means for collecting rainwater		X
35	A boarding ladder		X
36	Seat belts		X
37	Instructions of immediate action	X	X
38	Water resistant instructions	X	X

6.2.2 On board maintenance procedures

6.2.2.1 General

As a result of inspection, any defective parts should be repaired in accordance with following procedures. Any shortage of quantity should be supplemented to the correct number. Defective parts other than the following should be recorded along with their details and ordered for maintenance and repair by the manufacturers.

6.2.2.2 Boat

6.2.2.2.1 Rust on metal parts

Give anti-rusting treatment according to degree of damage, or replace if significantly wasted.

6.2.2.2.2 Damage of fabric

Repair fabric products by same material according to degree of damage.

6.2.2.2.3 Gasket

Repair with adhesive sealant according to degree of damage.

6.2.2.2.4 Drain valve

Remove any dirt and check correct operation.

6.2.2.2.5 Water spray system

Remove any deposit from spray nozzles. Tighten up pipe connecting parts when any leakage was noted. Adjust to proper tension on V-belt.

6.2.2.3 Engine

6.2.2.3.1 Oil coating and filling

When any rust exists, remove rust and coat with machine oil. Rotating parts should be filled with lubricating oil.

6.2.2.3.2 Operating test

An operational test of the engine should be carried out on board the ship and in the afloat condition after launching at an appropriate opportunity to check the running condition. After the operational test, ensure that the valves for the cooling water line are opened and flushed with fresh water and drained completely.

6.2.2.4 Electric parts

6.2.2.4.1 Battery

Fill up battery with electrolyte if level is below the designated position. Tighten up electric terminal if it is loose.

6.3 *Inspection and maintenance of launching appliances (davits and winches)*

6.3.1 Inspection and maintenance plan

Launching appliances should be inspected and maintained weekly and monthly in accordance with the following tables. The tables list the items to be checked, the method of inspection, the procedure to be followed, and the frequency at which the items are to be attended to.

Table 6.3.1.1 covers the davit.

Table 6.3.1.2 covers the winch.

Table 6.3.1.3 covers the electric parts.

Table 6.3.1.1 – Inspection procedure and maintenance plan for davit

Items	Method	Inspection procedure	Maintenance plan	
			Weekly	Monthly
Frame	Visual	Check corrosion, deformation and depression.	X	X
Davit arms	Visual	Check corrosion, deformation and depression.	X	X
	Operation	Moving out from stowed position.	X	
	Operation	Turning out from stowed position.		X
Sheave, suspension block	Visual	Check wear and corrosion.		X
	Operation	Check moving condition.	X	X
	Lubricate	Lubricate/grease.		X
Hinge pin, sheave pin	Lubricate	Lubricate/grease.		X
Davit arm stopper and trigger hook	Visual	Check wear and corrosion.	X	X
	Operation	Check moving condition.	X	X
	Lubricate	Lubricate/grease.		X
Boat fall, Turn buckle	Visual	Check wear, breakage of wire and corrosion.		X
	Lubricate	Lubricate/grease.		X
	Turn ends	Turn ends of boat fall (2.5 years).		
	Replacing	Replacing boat fall (5 years).		
Lashing wire rope	Visual	Check wear, corrosion and looseness.	X	X
Deck operation device	Operation	Check moving condition.		X
	Lubricate	Lubricate/grease.		X
Remote control wire	Visual	Check wear and corrosion.	X	X
	Operation	Check moving condition.		X
	Lubricate	Lubricate/grease.		X
Boat chock	Visual	Check wear and corrosion.	X	X

Table 6.3.1.2 – Inspection procedure and maintenance plan for winch

Items	Method	Inspection procedure	Maintenance plan	
			Weekly	Monthly
Gear box, gear, bearing, oil seal	Visual	Check level and deterioration of lubricating oil.		X
	Operation	Check unusual noise.		X
Brake system, Centrifugal brake	Visual	Check corrosion or any defects.	X	X
Wire end cotter	Visual	Check looseness.		X
Brake lever	Visual	Check corrosion or any defects.	X	X
	Operation	Check operating condition.	X	X
Speed change lever	Lubricate	Lubricate/grease.	X	X

Table 6.3.1.3 – Inspection procedure and maintenance plan for electric parts

Items	Method	Inspection procedure	Maintenance plan	
			Weekly	Monthly
Electric motor	Visual	Check wiring.	X	X
	Operation	Check normal operation.		X
Limit switch	Visual	Check wiring.	X	X
	Operation	Check normal operation.		X
	Lubricate	Lubricate/grease.		X
Push-button switch box and cable	Visual	Check wiring and other defects.	X	X
	Operation	Check normal operation.		X
Start panel	Visual	Check wiring and other defects.	X	X
	Operation	Check normal operation.		X

6.3.2 On-board maintenance procedure

6.3.2.1 General

As a result of inspection, any defective parts should be repaired in accordance with following procedures. Any shortage of quantity should be supplemented to correct number. Defective parts other than the followings should be recorded along with their details and ordered for maintenance and repair by the manufacturers.

6.3.2.2 Wire rope

6.3.2.2.1 Wire ropes should be changed in the following cases:

- .1 break of elemental wire was observed;
- .2 7% reduction of nominal diameter was observed;
- .3 kink or looseness of ply was observed; or
- .4 erosion/corrosion was observed.

6.3.2.2.2 Check fixing condition of wire ropes.

6.3.2.2.3 Change the boat falls within an appropriate period.

6.3.2.2.4 Adjust the length of boat falls as necessary so that the clearances between the davit arm and davit arm stopper at fore and aft are almost the same.

6.3.2.2.5 Ensure that material and diameter of suspension links are as specified by the release gear manufacturer.

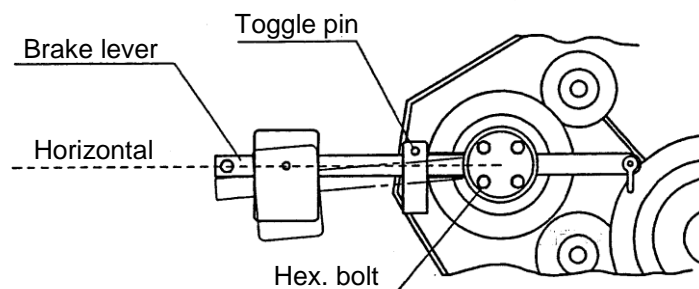
6.3.2.3 Boat winch

6.3.2.3.1 Prior to commencement of the maintenance work for the winch, the boat should be secured to prevent movement.

6.3.2.3.2 Oil should be checked and changed if discoloured. In case that oil level is low, oil should be added until the its surface comes to the designated level in the oil gauge.

6.3.2.3.3 Surfaces of each gear inside the gear box should be checked. In case that a defect is found on a surface of gear, the gear box should be replaced or repaired.

6.3.2.3.4 In case that the angle of brake lever has dropped due to abrasion of the brake lining, the angle of the brake lever should be adjusted by loosening the bolts, adjusting the angle and tightening the bolts again.



6.3.2.4 Greasing

6.3.2.4.1 Lubrication is essential for the function of the davit and winch and regular checking is necessary. Greasing also should be regularly conducted. For appropriate greasing, the detailed structure of the davit and winch and the functions of their parts should be understood.

6.3.2.4.2 All grease nipples of the davit should be greased at least once a month.

6.3.2.4.3 Gear oil inside the boat winch should regularly be checked regarding amount, change of colour and mixture of moisture.

6.3.2.4.4 Wire rope oil/grease should be regularly checked to prevent loss of oil/grease. Wire rope should be oiled or greased every two months in general.

ANNEX 14

STATEMENTS BY DELEGATIONS AND OBSERVERS

AGENDA ITEM 11 – Statement by the observer from BIMCO

"BIMCO would like to thank China for coordinating the Correspondence Group. Furthermore, we would like to thank Japan and IEC for their submissions.

BIMCO welcomes the development of IMO guidelines on safe operation of on-shore power supply service in port but believes caution must be taken when considering cold ironing to be a global sustainable technical solution.

Cold ironing calls for substantial investments both ashore and on board and several operational problems still need to be solved. BIMCO therefore is of the opinion that the measure is not practical for ships at this point in time.

For example:

- Cost effectiveness in using shore power vs onboard generators
- Incompatibility and lack of using uniform standards on voltage and frequency
- Shortage of sustainable energy used to produce electrical power in port around the world
- Lack of implementation of common international IEC and ISO standards
- Practical handling of cables and connections
- Absence of prevention of excessive load to shore power grid
- Waiting time for connecting and disconnecting on-shore power leading to prolonged port stay
- The price of shore power and transparency in price setting.

The number and complexity of these problems means that BIMCO cannot support development of a new mandatory framework or amendments to SOLAS."

AGENDA ITEM 17 – Statement by the delegation of the Bahamas

"Based on the accident investigations reported by China in their paper SSE 6/17/8, the Bahamas wishes to highlight the consequences that the failure of stop pins can cause, especially when they fail in handrails and/or bottom platforms.

Accordingly, the Bahamas wishes to bring the safety concerns due to the failure of these components to the attention of the maritime industry at large and invite urgent inspections to be performed on all stop pins, in particular to those used in the above-mentioned equipment."