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EQUIPMENT
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Agenda items 8, 9 and 10

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**REVISION OF THE 2010 FTP CODE TO ALLOW FOR NEW FIRE PROTECTION
SYSTEMS AND MATERIALS**

**REVIEW AND UPDATE SOLAS REGULATION II-2/9 ON CONTAINMENT OF FIRE TO
INCORPORATE EXISTING GUIDANCE AND CLARIFY REQUIREMENTS**

**UNIFIED INTERPRETATION OF PROVISIONS OF IMO SAFETY, SECURITY,
ENVIRONMENT, FACILITATION, LIABILITY AND
COMPENSATION-RELATED CONVENTIONS**

Report of the Correspondence Group

Submitted by IACS

SUMMARY

Executive summary: This document provides the report of the Correspondence Group on Fire Protection 1 relating to the revision of the 2010 FTP Code to allow for new fire protection systems and materials, the review and update of SOLAS regulation II-2/9 to incorporate existing guidance and clarify requirement, and the unified interpretation of SOLAS regulation II-2/4.2.4.

Strategic direction, if applicable: 7

Output: 7.34, 7.48 and 7.1

Action to be taken: Paragraph 210

Related documents: SSE 7/16/1, SSE 7/21; SSE 10/17/1; SSE 11/8, SSE 11/8/1, SSE 11/8/2, SSE 11/8/3, SSE 11/9, SSE 11/WP.5 and SSE 11/20

INTRODUCTION

1 The Sub-Committee on Ship Systems and Equipment (SSE), at its eleventh session, established the Correspondence Group on Fire Protection (FP Correspondence Group 1) under the coordination of IACS (SSE 11/20, paragraph 8.17) to discuss matters emanating from agenda items 8 (revision of the 2010 FTP Code), 9 (review and update of SOLAS regulation II-2/9) and 10 (draft unified interpretation based on annex 2 of SSE 11/WP.5).

2 Representatives of the following Member States participated in the Group:

AUSTRALIA	MARSHALL ISLANDS
BAHAMAS	NETHERLANDS (THE KINGDOM OF THE)
CANADA	NORWAY
CHINA	PANAMA
DENMARK	POLAND
FINLAND	REPUBLIC OF KOREA
FRANCE	RUSSIAN FEDERATION
GERMANY	SPAIN
INDIA	SWEDEN
IRELAND	TÜRKİYE
ITALY	UNITED KINGDOM
JAPAN	UNITED STATES
LIBERIA	UNITED ARAB EMIRATES

an observer from the following intergovernmental organization:

EUROPEAN COMMISSION (EC)

and the following non-governmental organizations in consultative status:

INTERNATIONAL CHAMBER OF SHIPPING (ICS)
INTERNATIONAL UNION OF MARINE INSURANCE (IUMI)
CRUISE LINES INTERNATIONAL ASSOCIATION (CLIA)
BIMCO
INTERNATIONAL ASSOCIATION OF CLASSIFICATION SOCIETIES (IACS)
INTERNATIONAL MARINE CONTRACTORS ASSOCIATION (IMCA)
INTERFERRY
INTERNATIONAL GROUP OF PROTECTION AND INDEMNITY ASSOCIATIONS
(P & I Clubs)
INTERNATIONAL TRANSPORT WORKERS' FEDERATION (ITF)
INTERNATIONAL WATER MIST ASSOCIATION (IWMA)

TERMS OF REFERENCE (TOR)

3 The Correspondence Group (Group) was instructed, taking into account the comments made and decisions taken at SSE 11, to:

with respect to the revision of the 2010 FTP Code to allow for new fire protection systems and materials (agenda item 8)

.1 consider further documents SSE 11/8 (in conjunction with document SSE 10/17/1), SSE 11/8/1, SSE 11/8/2 and SSE 11/8/3;

with respect to the review and update of SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements (agenda item 9)

.2 consider documents SSE 11/9/1, SSE 11/INF.3 and SSE 11/9/2, subject to the concurrence of MSC 110 pertaining to the scope of the output on "Review and update SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements" (SSE 11/20, paragraphs 9.9, 9.13 and 9.15);

.3 consider draft amendments for the revision of SOLAS regulation II-2/9, based on annex 2 of document SSE 10/17/1 and taking into account annex 1 thereof;

.4 consider document SSE 11/9;

with respect to the unified interpretation of SOLAS regulation II-2/4.2.4

.5 consider further the draft UI based on annex 2 of document SSE 11/WP.5, and to advise whether the safeguards were satisfied and the technical content was agreeable, with a view to finalization, as appropriate;

with respect to working arrangements

.6 consider potential working arrangements, based on the progress made intersessionally, in particular, whether multiple FP working groups would be needed at SSE 12, to advise the Sub-Committee; and

.7 submit a report to SSE 12.

TOR 1 – REVISION OF THE 2010 FTP CODE TO ALLOW FOR NEW FIRE PROTECTION SYSTEMS AND MATERIALS (AGENDA ITEM 8)

Draft amendments to include resolution A.753(18) in the 2010 FTP Code (SSE 11/8)

4 The Group considered document SSE 11/8, which proposes to dedicate annex 1, part 6 of the 2010 FTP Code to tests for plastic pipes and to refer to the *Guidelines for the application of plastic pipes on ships* (resolution A.753(18)), as amended, as a footnote. There was broad support for the proposal within the Group.

5 The Group agreed to omit the proposed introductory paragraph: "Resolution A.753(18), as amended, provides acceptance criteria for plastic materials in piping systems to assist maritime Administrations to determine, in a rational and uniform way, the permitted applications for such materials", noting that it serves primarily as an explanatory statement and that it could be misunderstood as elevating the non-mandatory status of the resolution.

6 The Group further agreed that only the fire test procedures in resolution A.753(18) should be referenced in the new draft annex 1, part 6, noting that the Guidelines also address other tests for plastic pipes (strength, ageing, fatigue, etc). Accordingly, the word "fire" was specified in the main body of the text for clarity, and the footnote was updated to refer to paragraph 2.2 of resolution A.753(18).

7 It was noted that, as per section 2 (Application) of the 2010 FTP Code, the draft new annex 1, part 6 would be mandatory only when referenced by SOLAS and that resolution A.753(18) would remain non-mandatory even when included as a footnote reference in the 2010 FTP Code. To preserve and clarify this non-mandatory status, the Group agreed to use the word "should" in the main body of the text.

8 It was pointed out that resolution A.753(18) was substantially modified by resolutions MSC.313(88) and MSC.399(55). The participants were divided on whether the footnote should refer to resolution A.753(18) "as amended" or specify the amending resolutions explicitly. However, the majority preferred the latter, and the footnote was updated to refer to resolution A.753(18) "as amended by resolutions MSC.313(88) and MSC.399(95)".

9 Subsequently, the Group prepared draft amendments to annex 1, part 6 of the 2010 FTP Code, as set out in annex 1.

Implications on the SOLAS Convention

10 The Group noted that the 2010 FTP Code would, as per its section 2 "Application", be mandatory only when referenced by SOLAS. In this context, the Group considered document SSE 10/17/1 (IACS), which proposed the inclusion of a requirement for plastic pipes in SOLAS regulation II-2/9.3.1 and a related footnote reference to resolution A.753(18).

11 The Group did not consider SOLAS regulation II-2/9.3.1 to be an appropriate location for addressing the application of plastic pipes nor referencing resolution A.753(18), noting that the regulation and the resolution appear to be unrelated. The SOLAS regulation is applicable to "penetrations" through fire resisting divisions, while the resolution addresses the application of plastic pipes.

12 The Group considered that penetrations in fire-resisting divisions, including plastic pipes, are sufficiently covered by the existing requirements in SOLAS regulation II-2/9.3 and the 2010 FTP Code, annex 1, part 3. The draft amendments to SOLAS regulation II-2/9.3.1, relating to "penetrations", as proposed in document SSE 10/17/1, were therefore considered unnecessary.

13 In this context, the Group considered that the unified interpretation of SOLAS regulation II-2/9.3.1 in *Unified Interpretations of SOLAS chapter II-2, the FSS Code, the FTP Code and related fire test procedures* (MSC.1/Circ.1120), which was proposed to be incorporated into SOLAS by the proposal in document SSE 10/17/1, has served its purpose and become obsolete after adoption of the 2010 FTP Code.

14 The Group confirmed that the "application" of plastic pipes is currently not addressed in the SOLAS Convention and agreed that a specific SOLAS requirement pertaining to the application of plastic pipes would be needed for the new draft annex 1, part 6 of the 2010 FTP Code to become mandatory.

15 It was acknowledged that the introduction of mandatory requirements for the application of plastic pipes falls outside the scope of the current output. However, the Group decided to propose the following indicative input to interested parties who may wish to develop a new output proposal addressing such requirements. The following list is indicative and not exhaustive:

- .1 SOLAS regulations II-2/5.3.2 on "Use of combustible materials" and II-2/6 on "Smoke generation potential and toxicity" could be appropriate locations for new requirement(s);
- .2 new requirement(s) may be formulated along the lines of "Piping materials other than steel or equivalent shall be tested according to the Fire Test Procedures Code";
- .3 the need for technical review of the related Guidelines in resolution A.753(18) may be considered;
- .4 reference to relevant ISO standards may be considered;
- .5 the need for ship-specific and/or space-specific application provisions, and possible exemptions, may be considered; and

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- .6 consequential draft amendments to the new draft annex 1, part 6 of the 2010 FTP Code to amend the word "should" to "shall" may be considered.

Draft modifications to the 2010 FTP Code (SSE 11/8/1)

16 The Group considered document SSE 11/8/1 (Austria et al.), which proposes various draft text adjustments and corrections to the 2010 FTP Code, with a view to improving uniformity to ensure consistent and fair interpretation thereof and a level playing field among manufacturers, test laboratories and Administrations.

17 The Group noted that SSE 11, having noted general support for the document, referred the document to the FP WG for further consideration. The Working Group, however, did not consider the document due to time constraints, and the document was further referred to the Correspondence Group.

18 The Group, also noting the views expressed during SSE 11 that further justification and rationale behind the proposals would be necessary, found that the proposals in the annex to document SSE 11/8/1 were not addressed or justified in the main body of the document. As a result, the Group did not have sufficient information to determine whether the proposals fell within the scope of the output and therefore sought to clarify this.

19 The Group has, therefore, considered the proposals in the annex of document SSE 11/8/1 from three perspectives; first, by seeking to establish the technical rationale behind each proposal; secondly, to identify the type of new fire protection materials and systems the proposals were addressing, and thirdly, by technical considerations of the proposals themselves. The proposals are addressed in the order in which they appear in the annex to document SSE 11/8/1.

Deformation – Test for "A", "B" and "F" class divisions (annex 1, part 3)

20 The annex to document SSE 11/8/1 proposes to delete paragraph 8.4.5 of appendix 1 of annex 1, part 3, which requires deformation measurements to be recorded during fire resistance testing of "A", "B" or "F" class divisions. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: The prescribed deflection measurements lack corresponding performance criteria. It was suggested that the measurements could be made voluntary rather than mandatory.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Some participants supported the proposal or suggested to clarify the testing requirements by including criteria for acceptable deflection. It was also noted that deformation measurements may provide valuable technical data, for example for monitoring of weak spots, comparison of materials (steel/aluminium, sandwich panels, etc.) and evaluation of larger constructions. The measurements are also referenced in part 11. The implications of deletion should be clarified.

21 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the deletion from a technical perspective.

Surface finishes – Test for "A", "B" and "F" class divisions (annex 1, part 3)

22 The annex to document SSE 11/8/1 proposes draft amendments to paragraph 1.15 of appendix 1 of annex 1, part 3, which requires constructions to be tested without paint or other superimposed finish, unless agreed or considered otherwise by the Administration. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: Surface finishes may negatively affect the insulation performance of the division. Testing without them may, therefore, not always reflect the worst-case scenarios. The proposal seeks to minimize the scope of testing for groups products.
- .2 New fire protection systems/materials: It has not been demonstrated that the proposal relates to the introduction of new fire protection systems and materials.
- .3 Technical considerations: Some participants supported the proposal. However, it was also noted that constructions should in general be tested without paint or other superimposed finish. Views were expressed that finishes may influence the integrity and generally stiffen insulation materials. Other views were expressed that some non-breathable surfaces may negatively affect the insulation performance of the division by trapping heat and thereby increasing the surface temperatures. Superimposed finishes applied to the insulation surface after testing may therefore result in an actual configuration that is more onerous than the tested scenario. In this regard, one participant had experienced that products that had previously been tested without finishes required thicker insulation to achieve the same results when tested with finishes applied. It was noted that leaving the determination of the worst-case scenario to the individual flag Administration may impose an administrative burden on the applicants, test institutions and the Administrations and lead to inconsistent implementation. Guidelines for constructions that are produced only with a superimposed finish could be considered.

23 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and that the draft amendments would require further consideration from a technical perspective. It was noted that guidelines for constructions that are produced only with a superimposed finish could have merit in a broader context.

Non-combustible finishes – Test for "A", "B" and "F" class divisions (annex 1, part 3)

24 The annex to document SSE 11/8/1 proposes draft amendments to paragraph 1.16 of appendix 1 of annex 1, part 3 to remove the requirement that finishes included in "B" class specimens must also be included in the non-combustibility test of the construction. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: It appears inconsistent that SOLAS regulations II-2/5.3.2.4.1 and 5.3.2.4.2 require surfaces and paints in concealed or inaccessible spaces to have low flame-spread characteristics, while the 2010 FTP Code requires "B" class constructions that cannot be tested without finishes to be tested for non-combustibility. Low flame spread characteristics are considered a less stringent requirement than non-combustibility.

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- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
 - .3 Technical considerations: Some participants supported the proposal. Others expressed that the proposal is understood to relate to the testing of constructions with superimposed finishes in paragraphs 22 and 23 above. For constructions that cannot be tested without finishes, the finish should be considered as part of the non-combustible insulation material and tested accordingly. The risk of unseen fire propagation along concealed spaces, and the related low flame spread requirements, are different from the fundamental requirement that "A" and "B" class divisions are inherently non-combustible. The purpose of SOLAS regulations II-2/5.3.2.4.1 and 5.3.2.4.2 is to prevent the spread of flames and smoke from finishes in concealed or inaccessible spaces, which fire-fighting teams cannot enter, when exposed to heat from a fire in adjacent spaces.

25 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Multipurpose penetrations – Test for "A", "B" and "F" class divisions (annex 1, part 3)

26 The annex to document SSE 11/8/1 proposes revisions to section A.III on pipe and duct penetrations and section A.IV on cable transits in appendix 2 of annex 1, part 3 to harmonize the testing provisions for multipurpose penetrations/transits accommodating both pipes and cables, and to standardize the placement of thermocouples. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: Increased use of multipurpose penetrations that incorporate both pipes and cables. The existing standards may not adequately address the challenges posed by these combined systems. Additionally, there are discrepancies in the placement Guidelines for thermocouples, leading to variations in their positioning.
- .2 New fire protection systems/materials: The proposal was considered to fall within the scope of the output.
- .3 Technical considerations: There was general support for the proposal in the Group, noting that specific proposals will be needed for the development of test provisions.

27 In conclusion, the Group considered the proposal to fall within the scope of the output, however, that text proposals were needed to develop test provisions for multipurpose cable/pipe penetrations.

Horizontal A-class hatches – Test for "A", "B" and "F" class divisions (annex 1, part 3)

28 The annex to document SSE 11/8/1 proposes the inclusion of A-class hatches in appendix 1 and 2 of annex 1, part 3. The assessment by the Group is summarized as follows:

- .1 Justification/rationale: Horizontal A-class hatches are used on board ships, however, there are no related test requirements in the 2010 FTP Code.

- .2 New fire protection systems/materials: The proposal was considered to fall within the scope of the output.
- .3 Technical considerations: There was general support for the proposal in the Group, noting that horizontal tests are generally more onerous than vertical tests due to the pressure effects within the test chambers. Specific proposals will be needed for the development of test provisions.

29 In conclusion, the Group considered the proposal to fall within the scope of the output, however, that text proposals were needed to develop a new section A.V on "A" class horizontal hatches.

Fixing of thermocouples on mineral wool – Test for "A", "B" and "F" class divisions (annex 1, part 3)

30 The annex to document SSE 11/8/1 proposes draft amendments to paragraphs 7.5.4.2 and 7.5.4.3 of appendix 1 of annex 1, part 3 to distinguish the requirements to fixing of thermocouples for A-60 divisions and A-30 or A-15 divisions. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: Contact adhesives for fixing of thermocouples may influence temperature measurements during fire resistance testing, as chemically bound water in the adhesive may create a temperature plateau. The effect is considered negligible for A-60 divisions but may positively affect the test results for A-15 and A-30 divisions. Mechanical fixing methods may, therefore, provide more reliable results for such divisions. Additionally, ceramic adhesives may be less effective on surfaces with low bonding properties, potentially causing detachment of thermocouples during drying or testing. The fire test laboratory should be given discretion to decide the most appropriate fixing method for the thermocouples.
- .2 New fire protection systems/materials: Fixing of thermocouples was not considered to be related to the introduction of new fire protection systems and materials.
- .3 Technical considerations: Achieved classification cannot always be determined prior to testing. Further, the ability to maintain bonding between the thermocouple and insulation material may not be linked to the intended "A" class performance, but rather to the nature and density of the fibrous material used. Concerns were also expressed related to added complexity and possible inconsistent implementation across fire test laboratories.

31 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Thermocouples on mineral wool pins – Test for "A", "B" and "F" class divisions (annex 1, part 3)

32 The annex to document SSE 11/8/1 proposes draft amendments to paragraph 7.6.1 of appendix 1 of annex 1, part 3 to specify that thermocouples may be fixed on pins at the discretion of the Administration. The assessment by the Group is summarized, as follows:

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- .1 Justification/rationale: Thinner or less dense insulation may increase thermal bridging through pins. Without requirements for temperature on pins, or a minimum distance between pins, excessive use of pins could pose safety risks. To avoid inconsistent practices across fire test laboratories, it is proposed that the decision to mount thermocouples on pins should rest with the Administration.
 - .2 New fire protection systems/materials: Fixing of thermocouples was not considered to be related to the introduction of new fire protection systems and materials.
 - .3 Technical considerations: It was noted that paragraph 7.6.1.6 already opens for additional thermocouples over “special features or specific construction details” and that pins could be specified in this context. At the same time, concerns were expressed that this paragraph could open for different practices between fire test laboratories, where some would measure temperature on pins and others not. The technical feasibility of placing thermocouples on some pins were also questioned. Constructions should in general be tested in the manner in which it is intended to be installed in board.

33 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and that the draft amendments would require further consideration from a technical perspective.

Header editorial improvement (applicable to the publication)

34 The annex to document SSE 11/8/1 proposes that the published version of the 2010 FTP Code indicates the appendix number in the header.

35 While the majority of the Group could support the proposal to improve the readability of the published version of the 2010 FTP Code, it was considered to fall outside the scope of the output. Therefore, the Group proposed that the Sub-Committee request the Secretariat to indicate the appendix numbers in the header in the next publication of the Code.

Products which may be installed without testing (annex 2)

36 The annex to document SSE 11/8/1 proposes a revision of annex 2 to distribute the products which may be installed without testing and/or approval to each of the Parts 1 – 11 of the 2010 FTP Code. The assessment by the Group is summarized as follows:

- .1 Justification/rationale: annex 2 may be overlooked, as it is located at the end of the 2010 FTP Code.
- .2 New fire protection systems/materials: The proposal does not relate to new fire protection systems and materials.
- .3 Technical considerations: Editorial restructuring is needed. However, the Group was split on whether creating new appendices to each of the parts 1 to 11 would enhance clarity.

37 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from an editorial perspective.

Fire protection materials and required approval test methods (main body of the 2010 FTP Code)

38 The annex to document SSE 11/8/1 proposes new paragraphs 4.1.3 and 4.1.4 in the main body of the 2010 FTP Code to reference annexes 3 and 4, respectively.

39 The Group had no objections to the editorial draft amendments, however, considered the proposal to fall outside the scope of the output.

Clear beam correction factor – Smoke and toxicity test (annex 1, part 2)

40 The annex to document SSE 11/8/1 proposes that "for information purpose only" is added to paragraph 9.2 of appendix 1 to annex 1, part 2. The assessment of the Group is summarized as follows:

- .1 Justification/rationale: Lack of clarity around the "Clear Beam Correction Factor" and whether D_c should be subtracted during smoke testing. The photocell may not be able to distinguish between airborne and residue on the lens, and the ambiguity may lead to inconsistent practices across laboratories and related inconsistent testing outcomes.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Further discussion would be necessary.

41 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output, however, noted that further discussions could be useful.

Application – Test for surface-flammability (annex 1, part 5)

42 The annex to document SSE 11/8/1 proposes draft amendments to paragraph 1.3 of annex 1, part 5 to include that the approved thickness of the substrate shall be the same or higher as used in the test. It is further suggested to split paragraph 1.3 into two separate paragraphs. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: enhanced readability and clarity, with one paragraph addressing non-combustible and non-metallic substrates (1.3) and one addressing metallic substrates (1.4).
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Some participants supported the proposal. However, views were expressed that substrates are not subject to approval, only the products applied to them, and that the added sentence, therefore, could not be supported. Some participants supported the editorial split of clause 1.3 for clarity.

43 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Appendix 4 – Test for surface flammability (annex 1, part 5)

44 The annex to document SSE 11/8/1 proposes splitting appendix 4 of annex 1, part 5, so that provisions for parts 2 and 5 are mentioned in their respective parts.

45 The Group had no objections to the editorial draft amendments, however, considered the proposal to fall outside the scope of the output.

New appendix 3 – Smoke and toxicity test (annex 1, part 2)

46 The annex of document SSE 11/8/1 proposes a new appendix 3 to annex 1, part 2 as a consequence of the proposal to split appendix 4 of annex 1, part 5.

47 The Group considered the proposal to be editorial in nature and to fall outside the scope of the output.

Test specimen – Smoke and toxicity test (annex 1, part 2)

48 The annex to document SSE 11/8/1 proposes editorial corrections to annex 1, part 2 as a consequence of the proposal to split appendix 4 of annex 1, part 5.

49 The Group considered the proposal to be editorial in nature and to fall outside the scope of the output.

Ranges – Non-combustibility test (annex 1, part 1)

50 The annex to document SSE 11/8/1 proposes draft new paragraphs 7.3.12 and 7.3.13 in annex 1, part 1 on Fire Test Procedures to address non-homogeneous insulation products. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: The proposal considers that it is not possible to define generic worst-case scenarios for non-homogeneous products in general, however, that it should be possible for non- insulation products with superimposed finishes. The proposal seeks to homogeneous minimize the scope of testing for groups of products.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Some participants supported the proposal. However, concerns were also expressed that defining generic worst-case scenarios and allowing manufacturers to determine such scenarios for non-homogeneous products may not be appropriate due to the complexity of these products. Non- homogeneous products may consist of multiple layers with varying thicknesses and densities, and each configuration requires individual assessment.

51 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Proposed updates to the 2010 FTP Code (SSE 11/8/2)

52 The Group considered document SSE 11/8/2 (United States), which proposes clarification to a number of sections, proposes changes to the existing text and identifies areas for discussion and development.

53 Similar to the content of document SSE 11/8/1, SSE 11 referred the document to the FP WG for further consideration, however the Working Group did not consider the document due to time constraints, and the document was further referred to the Correspondence Group.

54 The Group, therefore, considered the proposals in the annex to document SSE 11/8/2 from three perspectives; first, by seeking to establish the technical rationale behind each proposal; secondly, to identify the type of new fire protection materials and systems were addressed, and thirdly, by technical considerations of the proposals themselves. The proposals are addressed in the order in which they appear in the annex to document SSE 11/8/2, followed by consideration of paragraph 7 of the document.

Approval (main body of the 2010 FTP Code)

55 The annex to document SSE 11/8/2 proposes draft amendments to paragraph 5.2.4 of the 2010 FTP Code to remove information on the test substrate and test specimen from the type approval certificates for surface materials. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: The type approval certificates should describe the restrictions of the approved material, rather than the "tested specimen".
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Information about the colour, substrate and organic contents may represent necessary restrictions and should not be deleted from type approval certificates. Depending on the tested colour, the results may cover a range of colours or just one colour. Views were also expressed that clearer language in certificates to define approval limits could be useful, rather than relying on test specimen descriptions.

56 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Test specimen & standard test procedure – Non-combustibility test (annex 1, part 1)

57 The annex to document SSE 11/8/2 proposes draft amendments to paragraphs 5.2.3 and 7.3.8.1 of the appendix to annex 1, part 1 to allow compression of test specimens and early termination of failed test. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: Ensuring that samples are tested in a representative state if they expanded significantly during sample preparation. Allowing failed tests to be terminated early to reduce unnecessary testing burden.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.

- .3 Technical considerations: Some supported the justification that samples should be tested in a representative state, i.e. that compression of specimens that have expanded due to test preparations should be allowed. Others disagreed, raising concerns about the technical feasibility of such compression and that it would not be generally applicable to all types of products that could be compressed before a test. Views were expressed that the draft new paragraph 7.3.8.1 was unnecessary, noting that there is no need to continue testing of a failed specimen.

58 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Deformation – Test for "A", "B" and "F" class divisions (annex 1, part 3)

59 The annex to document SSE 11/8/2 proposes to delete paragraph 8.4.5 of appendix 1 of annex 1, part 3, which requires deformation measurements to be recorded during fire resistance testing of "A", "B" or "F" class divisions.

60 The Group considered the same proposal in document SSE 11/8/1. The majority of the Group considered the proposal to fall outside the scope of the output and questioned the deletion from a technical perspective (paragraph 20).

Performance criteria – Test for surface flammability (annex 1, part 5)

61 The annex to document SSE 11/8/2 proposes draft amendments to paragraph 3.2 and table 1 of annex 1, part 5 to align the performance criteria for floor coverings and primary deck coverings. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: Allowing floor coverings and primary deck coverings to be treated as unified product series for testing purposes. While the test apparatus holds samples in the vertical position, in practice, materials applied to horizontal surfaces will not create burning droplets.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Some supported aligning test criteria for floor coverings and primary deck coverings on the basis that burning droplets are not a relevant concern for horizontal surfaces. Other participants disagreed with the proposed removal of the burning droplet criterion, noting its importance for multilayer floor coverings and the desired fire safety level. For multilayer floor coverings, burning droplets comes from materials that melt during testing, which could ignite any layer underneath.

62 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Specimens – Test for surface flammability (annex 1, part 5)

63 The annex to document SSE 11/8/2 proposes draft new paragraphs 7.3.3 and 7.3.4 in appendix 1 of annex 1, part 5 to add substrate requirements for all types of products tested under parts 2 and 5. The Group's assessment is summarized, as follows:

- .1 Justification/rationale: The content of the draft new paragraphs is specified in other paragraphs and proposed duplicated under paragraph 7.3 for clarity. The intent is to align paragraph 7.3 with table 1 of appendix 4.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Some supported duplication of the substrate requirements for all types of products tested under parts 2 and 5. Concerns were raised regarding inconsistencies with existing requirements, particularly regarding substrate thickness and terminology, and questioned the technical accuracy of the proposed changes.

64 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Selection of the test specimen – Test for surface flammability (annex 1, part 5)

65 The annex to document SSE 11/8/2 proposes draft amendments to paragraph 2.2 of appendix 4 of annex 1, part 5 to clarify the specimen thickness requirements. Draft amendments to paragraph 2.6 to align this paragraph with paragraph 4.6.5, which allows one test if the samples have similar organic content. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: Clarifying specimen thickness requirements based on the maximum sample size the Part 2 test apparatus can accommodate. Clarifying that both the highest organic content and the darkest colour may be used as basis for sample selection.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Views were expressed that the proposal to clarify specimen thickness requirements based on the limitations of the test apparatus could be supported. In this context, views were also expressed that the proposal in document SSE 11/8/1 for splitting appendix 4 of annex 1, part 5, so that provisions for parts 2 and 5 are mentioned in their respective parts, were preferred, however, that the content from this proposal should be taken into account. Some disagreed with the added sentence that Administrations may require less samples if the darkest colour specimen has similar organic content to the sample with the most organic content.

66 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Test method – Test for bedding components (annex 1, part 9)

67 The annex to document SSE 11/8/2 proposes draft amendments to paragraph 5.2 of the appendix to annex 1, part 9 to remove the specification of density for mineral wool under the apparatus and material requirements. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: The specification of density of the mineral wool is unnecessary, since this is used for instrument protection and does not influence the tested specimen.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Some participants supported that mineral wool density does not influence the tested specimen and could be removed. Some participants opposed the change, emphasizing that consistent testing conditions, including wool density, are important, particularly for thin materials.

68 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Products which may be installed without testing and/or approval (annex 2)

69 The annex to document SSE 11/8/2 proposes draft amendments to paragraph 2.3 of annex 2, relating to materials not generating excessive quantities of smoke nor toxic products in fire. The draft amendments seek to exempt specimens of thickness 2 mm or less from testing in accordance with standard ISO 1716 on determination of calorific value. The assessment by the Group is summarized, as follows:

- .1 Justification/rationale: Specimens of thickness 2 mm and less are considered low fire load and are still required to be tested for surface flammability under part 5.
- .2 New fire protection systems/materials: It was not possible to establish a link between the proposal and the introduction of new fire protection systems and materials.
- .3 Technical considerations: Some participants supported that specimens of 2 mm thickness or less are considered low fire load and need not be tested according to ISO 1716 if they also pass the surface flammability test under part 5. Some participants questioned the relevance of thickness alone as a criterion, emphasizing the importance of heat release values (Q_t and Q_p), and others raised concerns about potential safety implications.

70 In conclusion, the majority of the Group considered the proposal to fall outside the scope of the output and questioned the draft amendments from a technical perspective.

Areas of future discussion (paragraph 7 of document SSE 11/8/2)

71 Paragraph 7 to document SSE 11/8/2 proposes additional areas of future discussion. The Group sought to identify the rationale behind the proposals, and its assessment is summarized below.

Burning droplets (paragraph 7.1)

72 Concerns were expressed that the burning droplet criterion in annex 1, part 5 are difficult to apply in practice. Distinguishing between burning droplets, fragments, and debris is challenging for technicians during testing, especially given the focus required on other test parameters.

73 The Group did not share the concerns that the identification of burning droplets is ambiguous and considered the issue to be outside the scope of allowing new fire protection systems and materials.

25 g samples of thin materials (paragraph 7.2)

74 Concerns were expressed that the requirement to test 25 g of a sample can result in very large samples for products that are very light or very thin. It was suggested that samples smaller than 25 g should be recorded in the test report.

75 The Group noted that, in theory, the requirement to test 25 g of a sample may result in very large samples for products that are very light or thin. However, no negative experiences were reported, and no practical examples or information about products which could be affected, were provided. It was further noted that the 25 g mass is only related to the moisture/organic content test.

Optical clear beam correction factor (paragraph 7.3)

76 Concerns were expressed that the smoke correction factor, which is used to adjust for sensor contamination from previous test, may obscure the true smoke output of a sample. If enough smoke and dust settle on the optical sensor, the correction may outweigh the actual signal, potentially allowing non-compliant samples to pass.

77 The Group considered a similar concern under document SSE 11/8/1 (paragraph 30).

Initial flaming (paragraph 7.4)

78 Concerns were expressed that materials like aerogels can exhibit rapid but weak initial flaming due to their structure, which may lead to a failing result under part 5 despite their good insulation properties. Similar behaviour has been observed in other composites, where brief surface flaming from off-gassing does not necessarily indicate a real fire spread risk.

79 The Group did not consider the criteria in part 5 to be ambiguous, nor within the scope of allowing new fire protection systems and materials. It was noted that the purpose of part 5 is to test flame spread reaction to fire test, not resistance to fire. Off-gassing that starts locally, spreads quickly and extinguishes just as fast from the initial burning point, is still considered flame spread that could ignite materials beyond the initial source. It was further noted that appendix 3 of the 2010 FTP Code provides guidance for interpreting unusual behaviour, with the general approach being to classify based on the worst observed performance along the centreline.

Scope of the output on "Revision of the 2010 FTP Code to allow for new fire protection systems and materials"

80 Two participants noted that, following the review by the Group, documents SSE 11/8/1 and SSE 11/8/2 appear to be considered largely out of scope and deferred to a future possible comprehensive revision of the 2010 FTP Code.

81 The two participants considered that during SSE 11, both documents were generally supported, and the plenary discussions did not indicate that the output was strictly limited to new fire protection materials and systems, despite the title of the output. The two participants considered that the scope of the output had been inadvertently limited to new materials and systems in the Correspondence Group.

82 The Group noted that the scope of the output was formally established by MSC 103, as outlined in paragraph 18.27 to 18.28 of document MSC 103/21:

"18.27 The Committee considered document MSC 102/21/11 (Austria et al.) proposing a new output on a revision of the International Code for Application of Fire Test Procedures, 2010 (2010 FTP Code) in order to allow for new fire protection systems and materials, also taking into account unified interpretations of the Code and most recent ISO fire test standards.

18.28 Following discussion, the Committee agreed to include in its post-biennial agenda an output on "Revision of the 2010 FTP Code to allow for new fire protection systems and materials", with three sessions needed to complete the item, assigning the SSE Sub-Committee as the associated organ."

83 The scope of the output proposal is described in paragraphs 6 to 8 to document MSC 102/21/11. The proposals in documents SSE 11/8/1 and SSE 11/8/2 do not address existing unified interpretations of the 2010 FTP Code or revised ISO fire test standards.

84 Participants who considered that the scope had been inaccurately interpreted or described were encouraged to seek clarification from SSE or MSC, as appropriate. However, based on the request from one participant, the Group was also invited to state whether they considered the scope of agenda item 8 to implicitly or explicitly allow for updates to the existing 2010 FTP Code, including updates that do not pertain to new systems and materials. A clear majority of the participants did not respond to this question.

85 In that respect, the coordinator notes paragraphs 5.8 and 5.9 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.6) pertaining to the scope of outputs, which reads:

"5.8 With the aim of facilitating the technical work being carried out effectively and efficiently, the proponent(s) of new outputs [...] should ensure that sufficient and relevant information, in line with the need or compelling need as determined by the Committee, is made available to the subsidiary body when embarking on its technical work. [...]

5.9 Subsidiary bodies should not expand the scope of existing outputs or develop amendments to, or interpretations of, any relevant IMO instrument unless directed or authorized to do so by their parent Committee. [...]"

Proposal on adding "H" class related procedures in part 3, annex 1 of the FTP Code (SSE 11/8/3)

86 The Group considered document SSE 11/8/3 (China), which proposes to amend part 3, annex 1 of the 2010 FTP Code by adding fire test requirements for "H" class divisions, so as to provide guidance on the implementation of tests according to unified standards and ensure the accuracy and reliability of the tests.

87 The Group noted that, as there are no requirements to "H" class divisions in the SOLAS Convention, any requirements for "H" class divisions in the 2010 FTP Code would be non-mandatory. The need to enhance the existing structural fire protection requirements in SOLAS regulation II-2/9 has not been considered in the context of reviewing document SSE 11/8/3.

88 The Group considered the specification of the hydrocarbon fire curve in the draft new paragraph 8.3.1.5 of the annex to document SSE 11/8/3 to be too vague. It was considered specifying the same standards that are referred to in the footnote of paragraph 1.3.26 of the 2009 MODU Code. However, the Group eventually agreed to specify the equation for the hydrocarbon fire curve, as well as related temperature values over time in draft new paragraphs 8.3.1.5 and 8.1.3.6, for clarity and consistency with the provisions provided in paragraphs 8.3.1.1 to 8.3.1.2 for the standard fire curve.

89 The equation for the hydrocarbon fire curve is derived from standard ISO 20902-1, paragraph 7.4.2 and annex B, using the hydrocarbon fire curve equation in standard NS-EN 1363:1999.

90 In the last round of correspondence, it was noted that allowances for inaccuracies for test furnaces, similar to those in paragraphs 8.3.1.3 and 8.3.1.4 for the standard fire curve, should be established also for the hydrocarbon fire curve. There was no time to consider the proposal, however, tolerances, as outlined in paragraph 4.3 of standard NS 1363-2:1999, and related editorial clarifications, have been included within square brackets as new paragraphs 8.3.1.7 and 8.3.1.8 for further consideration.

91 The Group agreed that consequential draft amendments would be needed also to other parts of the 2010 FTP Code to fully accommodate the incorporation of "H" class divisions in the 2010 FTP Code. In this context, it was noted that the Code assumes that doors, windows, penetrations and other local weaknesses are tested in bulkheads insulated to A-60 class standard. The Group identified many potential draft amendments and invited interested parties to submit specific proposals as basis for further consideration.

92 In the last round of correspondence, it was suggested including a reference in paragraph 3 of annex 3, part 3 stating that the same requirements apply to "H" class divisions as "A" class divisions. There was no time to consider whether the proposal would address the observations in paragraph 91 above, however, the proposal has been included within square brackets as a new paragraph 1.1 in annex 1, part 3 for further consideration.

93 The draft amendments to annex 1, part 3 of the 2010 FTP Code, as agreed in paragraphs 88 and 89 above, and suggested in paragraphs 90 to 92, are set out in annex 2.

Consequential draft amendments to the 2009 MODU Code

94 The Group noted that consequential draft amendments to paragraph 1.3.26 of the 2009 MODU Code may be needed to reference the 2010 FTP Code for testing of "H" class divisions if "H" class divisions are added to the 2010 FTP Code. However, views were also expressed that draft amendments to the 2009 MODU Code may be outside the scope of the output.

95 Draft amendments to paragraph 1.3 "Definitions" of the 2009 MODU Code were provided in the last round of correspondence. There was no time to consider the proposal in the Group, however, it has been included in annex 3 for further review.

TOR 2 - EXISTING IACS GUIDANCE ON SOLAS REGULATION II-2/9 (SSE 11/9/1 AND SSE 11/INF.3), PROPOSAL OF AMENDMENTS TO SOLAS REGULATION II-2/9.7.4.5 PERTAINING TO VENTILATION DUCTS (SSE 11/9/2)

96 MSC 110 agreed that documents SSE 11/9/1 (IACS), SSE 11/INF.3 (IACS) and SSE 11/9/2 (China) were outside the scope of this output. As a result, the proposals in these documents have not been considered by the Group.

TOR 3 - REVIEW AND UPDATE SOLAS REGULATION II-2/9 ON CONTAINMENT OF FIRE TO INCORPORATE EXISTING GUIDANCE AND CLARIFY REQUIREMENTS (SSE 10/17/1)

97 The Group considered document SSE 10/17/1 (IACS), which provides a comprehensive list of existing guidance and corresponding draft amendments to SOLAS regulation II-2/9 in annexes 1 and 2 of the document, respectively, together with additional amendments to SOLAS regulation II-2/3.

98 The individual draft amendments to the text of SOLAS regulation II-2/9 are addressed first (paragraphs 99 to 179), followed by draft amendments to the tables in SOLAS regulation II-2/9 and their footnotes (paragraphs 180 to 188). The draft amendments to SOLAS regulation II-2/3 are consequential to the clarifications of SOLAS regulation II-2/9 and are considered last (paragraphs 189 to 193). The draft amendments prepared by the Group, are set out in annex 4.

Draft amendments to SOLAS regulation II-2/9***Main vertical zones – SOLAS regulation II-2/9.2.2.1.3.1***

99 The Group agreed to incorporate the unified interpretation of SOLAS regulation II-2/9.2.2.1, as set out in MSC.1/Circ.1120, into a new SOLAS regulation II-2/9.2.2.1.3.1 addressing stairways serving two main vertical zones.

100 It was agreed to use the term "shall" rather than "is/are to" for clarity.

Continuous "B" class ceilings – SOLAS regulation II-2/9.2.2.2.1

101 The Group agreed to incorporate the unified interpretation of SOLAS regulation II-2/9.2.2.2.1, as set out in MSC.1/Circ.1120, into the regulation.

102 It was noted that the regulation is only applicable to passenger ships carrying less than 36 passengers and only when "B" class continuous ceilings are fitted. The interpretation addresses the material of the portion of the bulkhead above/behind the continuous ceiling/lining. This portion of the bulkhead is not required to be B-class formally, as the B-class continuity is already achieved by the B-class continuous ceiling. Accordingly, the interpretation is considered to set a standard for "reasonable and practicable" B-0 extensions.

103 The Group agreed to use sub-paragraphs for increased readability and to include a new sub-paragraph 3 to ensure that the flexibility to accept other methods for construction of extended B-class bulkheads is maintained. Editorial amendments to improve clarity and flow were agreed.

"B" class bulkheads within a main vertical zone – SOLAS regulation II-2/9.2.2.2.3

104 The Group was split regarding whether the unified interpretation of SOLAS regulation II-2/9.2.2.2.3, as set out in MSC.1/Circ.1120, should be incorporated into the regulation, noting that *the Guidelines on fire safety construction in accommodation areas* (MSC.1/Circ.917) would need to be revised to ensure accuracy and alignment with current practices. A slight majority of the Group still preferred to include a reference to MSC.1/Circ.917 at this stage.

105 When considering ToR 4 of the CG, most participants considered MSC.1/Circ.917 to require review and update, however that a new output proposal would be required (refer to paragraph 201).

106 In view of the above, the footnote reference to MSC.1/Circ.917 is included in square brackets for further consideration.

Diet kitchens – SOLAS regulation II-2/9.2.2.3.2.2(7)

107 The Group agreed to incorporate the unified interpretation of paragraph 2.2.3.2.2(7), of SOLAS regulation II-2/9, as set out in MSC.1/Circ.1120, into the regulation.

Fire risk categories of spaces containing electrical distribution boards – SOLAS regulations II-2/9.2.2.3.2.2(7), 9.2.2.4.2.2(5), 9.2.3.3.2.2(5) and 9.2.4.2.2(5)

108 MSC.1/Circ.1120 provides unified interpretations of fire risk categorization of spaces containing electrical distribution boards for passenger ships carrying more than 36 passengers (paragraph 2.2.3.2.2(7)), passenger ships carrying not more than 36 passengers (paragraph 2.2.4.2.2(5)), cargo ships (paragraph 2.3.3.2.2(5)) and tankers (paragraph 2.4.2.2(5)).

109 The Group agreed to incorporate the second part of the unified interpretations, as set out in MSC.1/Circ.1120, into the respective regulations. It was agreed to remove the word "identifiable" for clarity.

110 The first parts of the unified interpretations are incorporated in new paragraphs, as outlined in paragraphs 111 to 114 below.

Location of electrical distribution boards – new SOLAS regulations II-2/9.2.2.3.6, 9.2.2.4.2.5, 9.2.3.3.2.2.3 and 9.4.2.2.2.3

111 The Group agreed to incorporate the first part of the unified interpretations of paragraphs 2.2.3.2.2(7), 2.2.4.2.2(5), 2.3.3.2.2(5) and 2.4.2.2(5) of SOLAS regulation II-2/9, as set out in MSC.1/Circ.1120, into new regulations for passenger ships carrying more than 36 passengers (paragraph 2.2.3.6), passenger ships carrying not more than 36 passengers (paragraph 2.2.4.2.5), cargo ships (paragraph 2.3.3.2.2.3) and tankers (paragraph 2.4.2.2.2.3).

112 The phrase "without the need to categorize the space" was considered unnecessary and was, therefore, removed. Also, editorial amendments to clarify the phrase "provided no provision is made for storage" was agreed.

113 The second parts of the unified interpretations were incorporated in paragraphs 2.2.3.2.2(7), 2.2.4.2.2(5), 2.3.3.2.2(5) and 2.4.2.2(5) of SOLAS regulation II-2/9, as outlined in paragraphs 108 to 110 above.

114 One participant did not support the unified interpretation of paragraphs 2.2.3.2.2(7), 2.2.4.2.2(5), 2.3.3.2.2(5) and 2.4.2.2(5) of SOLAS regulation II-2/9, as set out in MSC.1/Circ.1120.

Pantries – SOLAS regulation II-2/9.2.2.3.2.2(9)

115 The Group agreed to incorporate the unified interpretation of paragraph 2.2.3.2.2(9) of SOLAS regulation II-2/9, as set out in the *Unified interpretation of SOLAS regulation II-2/9* (MSC.1/Circ.1634), into the regulation.

Fire integrity of the division between engine rooms and spaces, in which urea or sodium hydroxide solution tanks are installed – SOLAS regulations II-2/9.2.2.3.2.2(10), 9.2.2.4.2.2(7), 9.2.3.3.2.2(7) and 9.2.4.2.2.2(7)

116 The *Unified interpretation of SOLAS regulation II-2/9* (MSC.1/Circ.1616) provides unified interpretations on fire risk categorization of spaces, separated from engine rooms, where urea or sodium hydroxide solution tanks are carried on board passenger ships carrying more than 36 passengers (paragraph 2.2.3.2.2(10)), passenger ships carrying not more than 36 passengers (paragraph 2.2.4.2.2(7)), cargo ships (paragraph 2.3.3.2.2(7)) and tankers (paragraph 2.4.2.2.2(7)).

117 The Group agreed to incorporate the unified interpretations, as set out in MSC.1/Circ.1616, into the relevant regulations.

Arrangement of saunas – SOLAS regulations II-2/9.2.2.4.5, 9.2.3.3.5 and 9.2.4.2.7

118 MSC.1/Circ.1120 provides unified interpretations for arrangements of saunas for passenger ships carrying not more than 36 passengers (paragraph 2.2.4.5), cargo ships (paragraph 2.3.3.5) and tankers (paragraph 2.4.2.7).

119 The Group agreed to incorporate the unified interpretations, as set out in MSC.1/Circ.1120, into the regulation.

Permitted increased area up to 75 m² for public spaces on cargo ships constructed in accordance with method III C – SOLAS regulations II-2/9.2.3.1.1.3 and 9.2.3.2.4

120 The Group agreed to incorporate the unified interpretation of SOLAS regulations II-2/9.2.3.1.1.3 and II-2/9.2.3.2.4, as set out in MSC.1/Circ.1120, into the respective regulations.

121 The Group did not support the proposed amendments as drafted in annex 2 to document SSE 10/17/1, noting that the unified interpretation was not intended for "any accommodation spaces or spaces bound by an 'A' or 'B' class division".

122 The agreed draft amendments restrict the increased area of "up to 75 m²" exclusively to public spaces, in line with the unified interpretation in MSC.1/Circ.1120. In addition, the word "any" is removed from the preceding sentence to avoid contradiction with the new sentence.

Construction of protected stairways on cargo ships – new SOLAS regulation II-2/9.2.3.4.1.1

123 The Group agreed to incorporate the unified interpretation of paragraph 2.3.4.1 of SOLAS regulation II-2/9, as set out in MSC.1/Circ.1120, into a new sub-paragraph.

Dumb waiters – new SOLAS regulation II-2/9.2.3.4.2.1

124 The Group agreed to incorporate the unified interpretation of paragraph 2.3.4.1 of SOLAS regulation II-2/9, as set out in MSC.1/Circ.1120, into a new paragraph.

125 The Group agreed to relocate the proposed text to a new paragraph 2.3.4.3, to avoid limiting its application to the conditions under paragraph 2.3.4.2, which apply only to ships having accommodation for 12 persons or less. It was also agreed to use the word "shall" rather than "are to" for clarity.

126 Paragraph 2.3.4 applies to cargo ships except tankers. The Group noted that dumb waiters should ideally be consistently considered as lifts across all ship types and could not establish a rationale for MSC.1/Circ.1120 addressing dumb waiters for cargo ships only.

127 For passenger ships, the participants generally agreed that a new paragraph 2.2.5.3 would be an appropriate location to address dumb waiters in SOLAS regulation II-2/9. Noting that the introduction of such a new requirement for passenger ships would be consequential to the incorporation of the unified interpretation of paragraph 2.3.4.1 into the SOLAS Convention, the draft amendment is included in square brackets for consideration by the Sub-Committee.

128 For tankers, there is no dedicated paragraph on stairways and lifts similar to paragraph 2.3.4.3. However, lifts are included under fire risk category (4) "stairways" under paragraph 2.4.2.2.2. The Group agreed that dumb waiters should be treated as lifts also on tankers for the purposes of fire integrity and considered two alternative solutions, noting that the specification of "dumb waiters" for tankers would be consequential to the incorporation of the unified interpretation of paragraph 2.3.4.1 into the SOLAS Convention.

129 One proposed solution is to simply include "dumb waiters" in paragraph 2.3.2.2(4). Another option is to include a new paragraph 2.4.2.8 for tankers, which would reference paragraph 2.3.4 on the protection of stairways and lift trunks in accommodation spaces, service spaces and control stations. Both alternatives have been included in square brackets for further consideration.

Exterior boundaries of superstructures and deckhouses on tankers – SOLAS regulation II-2/9.2.4.2.5

130 The Group agreed to incorporate the unified interpretation of paragraph 2.4.2.5 of SOLAS regulation II-2/9, as set out in the *Unified interpretations of SOLAS chapter II-2 and the fire test procedures referred to in the FTP Code* (MSC.1/Circ.1203), into the regulation.

Penetrations in fire-resisting divisions and prevention of heat transmission – SOLAS regulation II-2/9.3.1

131 Under ToR 1, the Group considered that the unified interpretation of SOLAS regulation II-2/9.3.1, as outlined in MSC.1/Circ.1120, has served its purpose and has become obsolete after adoption of the 2010 FTP Code (see paragraphs 10 to 13 above).

132 The Group further considered that the unified interpretation of SOLAS regulation II-2/9.3.1, as outlined in MSC.1/Circ.1203, does not provide information additional to that which is already available in the first sentence of SOLAS regulations II-2/9.3.1 and II-2/9.2.4.2.5. Accordingly, the Group considered the unified interpretation in MSC.1/Circ.1203 to be superfluous and need not be incorporated into SOLAS.

Heat transmission at intersections – SOLAS regulation II-2/9.3.4

133 The Group agreed to incorporate the unified interpretation of SOLAS regulation II-2/9.3.4, as outlined in MSC.1/Circ.1120 and *Amendment to the unified interpretations of SOLAS chapter II-2, the FSS Code, the FTP Code and related fire test procedures* (MSC.1/Circ.1510), into a new paragraph 3.4.1.

Fire doors – SOLAS regulation II-2/9.4.1.1.1

134 The Group agreed to incorporate unified interpretation number 1 of SOLAS regulation II-2/9.4.1.1.2, as outlined in MSC.1/Circ.1120, into regulation 4.1.1.1, using the term "means of closing" instead of "doors". However, some participants considered the text to be obvious and adding limited value.

135 The second part of the unified interpretation is incorporated into regulation II-2/9.4.1.1.3 (see paragraphs 136 to 140 below).

Fire testing of watertight doors – SOLAS regulation II-2/9.4.1.1.3

136 The Group agreed to incorporate the unified interpretation of SOLAS regulation II-2/9.4.1.1.2, as outlined in the *Unified interpretations of the revised SOLAS chapter II-2* (MSC.1/Circ.1037) and MSC.1/Circ.1120, into regulation 4.1.1.3.

137 However, the references to SOLAS regulations II-1/15 and II-1/18 were found to be outdated and have been updated to SOLAS regulations II-1/16 and II-1/13, respectively.

138 The Group also discussed the rationale behind the unified interpretation in MSC.1/Circ.1120. There was broad agreement that flooding prevention is the primary function of watertight doors fitted below the bulkhead deck and that technical limitations may prevent these doors from being classified as both watertight and fire-rated.

139 It was further noted that watertight doors below the bulkhead deck are generally expected to perform reasonably well in a fire due to the heavy construction and the gastight gaskets. However, they are not expected to meet the "A" class fire test criteria because the gasket may generate brief flames on the unexposed side.

140 The Group also agreed to the proposed incorporation of unified interpretation number 2 of SOLAS regulation II-2/9.4.1.1.2, as outlined in MSC.1/Circ.1120, into SOLAS regulation II-2/9.4.1.1.3. The first part of the unified interpretation is incorporated into SOLAS regulation II-2/9.4.1.1.1 (see paragraphs 134 and 135 above).

Lift doors arrangement – new SOLAS regulation II-2/9.4.1.1.5.1

141 The Group agreed to incorporate the unified interpretation of SOLAS regulation II-2/9.4.1.1.4.6, as outlined in MSC.1/Circ.1120, into the SOLAS Convention.

142 It was agreed to establish a new paragraph 4.1.1.6, with corresponding renumbering of the subsequent paragraphs, as there is already a sub-paragraph 1 under paragraph 4.1.1.5. It was further agreed to clarify that sub-paragraph 2 is only applicable to "A" class lift doors.

143 In the last round of correspondence, one participant noted that the interpretation in MSC.1/Circ.1120 is explicitly for sub-paragraph .6 under SOLAS regulation II-2/9.4.1.1.5 for fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures. A new paragraph 4.1.1.6 would be applicable to all lift doors, and it was suggested that the location of the paragraph should be considered.

144 The draft new paragraph 4.1.1.6 is, therefore, put between square brackets for further consideration.

Ventilation ducts through main vertical zone divisions – SOLAS regulation II-2/9.4.1.1.9

145 The Group agreed that the text in SOLAS regulation II-2/9.4.1.1.9 duplicates the text in SOLAS regulation II-2/9.7.2.6. The Group was however split regarding whether a reference should be made to paragraph 7.2.6 for consistency or whether paragraph 4.1.1.9 should be removed.

146 Views were also expressed that the term "fail safe" should be maintained.

147 Draft amendments to paragraphs 4.1.1.9 and 7.2.6 have been proposed in square brackets for further consideration.

148 As per paragraphs 163 and 167 below, incorporation of the unified interpretation of SOLAS regulation II-2/9.4.1.1.8, as set out in MSC.1/Circ.1120, was not considered necessary.

Windows and side scuttles – SOLAS regulation II-2/9.4.1.3.1

149 The Group agreed to the proposal to include the unified interpretation of SOLAS regulation II-2/9.4.1.3.1, as outlined in MSC.1/Circ.1120, as a footnote in paragraph 4.1.3.1. However, the introductory sentence has been amended to clarify that the standards are listed for information only.

150 At the same time, comments were made that the references have limited purpose when the SOLAS text requires windows and side scuttles to be tested according to the 2010 FTP Code, and that references to non-IMO instruments should be kept at a minimum for maintenance purposes. The Group has not considered the content of the referenced ISO standards.

151 The agreed draft text has been included within square brackets for further consideration.

Doors and door frames construction – SOLAS regulation II-2/9.4.2.1

152 The Group agreed to the proposal to include two unified interpretations of SOLAS regulation II-2/9.4.2.1, as outlined in MSC.1/Circ.1120, into the regulation.

153 One participant did not support the second unified interpretation of paragraph 4.2.1 in MSC.1/Circ.1120 on the basis that certain SOLAS requirements explicitly require the use of "steel" without alternatives, while others permit "steel or equivalent material" (defined in SOLAS regulation II-2/3.43). The participant considered the proposed amendments to be amending the material specifications in SOLAS and that technical justification was necessary. Reference was made to SOLAS regulation II-2/11.4.1 on crowns and casings and II-2/11.4.2 on floor plating as examples of regulations which specify that the material used shall be steel only.

154 The Group considered the inclusion of the term "or equivalent material" to be consistent with the definition of "A" class divisions in SOLAS regulation II-2/3.2.1, which defines "A" class divisions as being constructed of steel or other equivalent material. Accordingly, it was considered that the second unified interpretation in MSC.1/Circ.1120, and the related draft amendment to paragraph 4.2.1 serves as a clarification to reflect that definition.

155 It was further noted that SOLAS regulation II-2/9.4.1.1.2 for passenger ships specifies that "such doors and door frames shall be constructed of steel or other equivalent material". It was assumed that the omission of "or other equivalent material" in SOLAS regulation II-2/9.4.2.1 may have been an oversight in drafting, as there is no presented rationale for cargo ships to have different requirements in this regard.

Non-combustible material as "steel or equivalent" for ventilation ducts – SOLAS regulation II-2/9.7.1.1

156 The Group considered the proposal to include the unified interpretation of SOLAS regulation II-2/9.7.1.1, as outlined in the *Unified interpretations of SOLAS chapter II-2* (MSC.1/Circ.1527), into the regulation.

157 SOLAS regulation II-2/9.4.2.1 addresses general material requirements for ventilation ducts and does not regulate penetrations through "A" or "B" class divisions. The regulation opens for the use of non-steel ventilation ducts by requiring the ducts to be of "steel or equivalent material".

158 SOLAS regulation II-2/3.43 defines "steel or equivalent material" as follows:

"Steel or other equivalent material" means any non-combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test (e.g. aluminium alloy with appropriate insulation)."

159 SOLAS regulation II-2/9.7.1.1 does not specify the appropriate "applicable exposure" for ventilation ducts constructed of non-steel materials, and the majority of the Group agreed that MSC.1/Circ.1527 provides guidance on this term in the context of SOLAS regulation II-2/9.7.1.1.

160 Some participants did not agree with incorporating the unified interpretation in MSC.1/Circ.1527 into SOLAS, considering it to be too strict for non-steel ventilation ducts penetrating "B-15", "B-0" or "C" class divisions, as the ducts would have structural and integrity properties superior to the divisions they are penetrating.

161 The draft amendments to SOLAS regulation II-2/9.7.1.1 have, therefore, been included in square brackets for further consideration, however, noting that also steel ducts are expected to have properties superior to "B-15", "B-0" or "C" divisions. A majority of the Group preferred to include the unified interpretation in MSC.1/Circ.1527 in a new paragraph for easier readability.

Arrangement of ducts – SOLAS regulations II-2/9.7.2.2, 9.7.2.3 and 9.7.2.5

162 The figures provided in the *Unified interpretations of the revised SOLAS chapter II-2* (MSC.1/Circ.1276) were proposed to be included in a new MSC circular containing explanatory figures to SOLAS regulation II-2/9. The draft new MSC circular was considered under ToR 4.

Type of means of closing of fire dampers – SOLAS regulation II-2/9.7.2.6

163 The Group did not see the need to incorporate the unified interpretation of SOLAS regulation II-2/9.7.3.1.2, as set out in MSC.1/Circ.1120, into the SOLAS Convention. MSC.1/Circ.1120 provides an interpretation of SOLAS regulation II-2/9.7.3.1.2, as amended by resolution MSC.99(73), on "types of means of closing". The interpretation was suggested to be incorporated into the current SOLAS regulation II-2/9.7.2.6, in addition to SOLAS regulation II-2/9.7.3.1.3.

164 The Group noted that the unified interpretation in MSC.1/Circ.1120 is older than the latest revision of the regulation. It was considered that its intended purpose had already been addressed in the current definition of "fire damper" in SOLAS regulation II-2/3.54, as adopted by resolution MSC.365(93) in 2014, and that its content is also addressed in SOLAS regulation II-2/9.7.3.3.

165 Accordingly, the Group found the unified interpretation of SOLAS regulation II-2/9.7.3.1.2 in MSC.1/Circ.1120 to be redundant..

Ducts passing through "A" class divisions – SOLAS regulation II-2/9.7.3.1.2

166 The Group agreed to include the unified interpretation of SOLAS regulation II-2/9.7.3.1.2, as outlined in the *Unified interpretations of the revised SOLAS chapter II-2* (MSC.1/Circ.1655), into the regulation.

Fire insulation of duct sleeves – SOLAS regulation II-2/9.7.3.1.3

167 The Group agreed to incorporate the understanding in "case 2" in document SSE 7/16/1 (paragraph 3.2) into SOLAS regulation II-2/9.7.3.1.3. The draft amendments reflect that the section of the duct between the fire damper and the division that the duct is penetrating, shall be provided with fire insulation that has at least the same fire integrity as the division that the duct is penetrating.

168 Document SSE 7/16/1 presented three different draft unified interpretations of SOLAS regulation II-2/9.7.3.1.3 on fire insulation of the sleeve of ventilation ducts. SSE 7 noted that "case 2" would be preferable to address the ambiguity concerning the fire insulation of the sleeve of the duct that was situated between the fire damper and the division that the duct was penetrating (SSE 7/21, paragraph 16.10).

169 Similar to SOLAS regulations II-2/9.4.1.1.9 and II-2/9.7.2.6, the Group did not see the need to incorporate the unified interpretation of SOLAS regulations II-2/9.4.1.1.8 and II-2/9.7.3.1.2, as set out in MSC.1/Circ.1120, into paragraph 7.3.1.3.

Details of fire dampers and duct penetrations – new SOLAS regulation II-2/9.7.3.2.1

170 The Group agreed to include the unified interpretation of SOLAS regulation II-2/9.7.3.2, as outlined in MSC.1/Circ.1655, into a new paragraph 7.3.2.1. A rephrased version of the text was agreed for clarity.

171 In the last round of correspondence, it was suggested to use the word "gap" rather than "space" for clarity. The proposal is included in square brackets for consideration at SSE 12.

Ventilation system penetrating decks – SOLAS regulation II-2/9.7.4.4

172 The Group considered the unified interpretation of SOLAS regulation II-2/9.7.4.3, as set out in MSC.1/Circ.1120, to be addressed by paragraphs 7.4.4 and 7.3.3, and the definitions in SOLAS regulations II-2/3.54 and II-2/3.55.

173 However, it was noted that the unified interpretation in MSC.1/Circ.1120, in its first paragraph, opens for the use of both smoke and fire dampers in ventilation systems penetrating decks, and that this interpretation is not reflected in the current SOLAS regulations.

174 Accordingly, the Group agreed on draft amendments to SOLAS regulation II-2/7.4.4 to address only the portion of the unified interpretation in MSC.1/Circ.1120 which is not already addressed in SOLAS.

Means for extinguishing fires within exhaust ducts – SOLAS regulations II-2/9.7.5.1.1.3 and II-2/9.7.5.2.4

175 The Group agreed to incorporate the unified interpretation of SOLAS regulation II-2/9.7.5, as set out in MSC.1/Circ.1616, into the footnote of paragraphs 7.5.1.1.3 and 7.5.2.4.

176 One participant did not support the content of the unified interpretation in MSC.1/Circ.1616, expressing concern that the use of CO₂ for cooking fires could result in deep-seated fires in galley ducts remaining after CO₂ release.

Ventilation rooms – SOLAS regulations II-2/9.7.6.1 and II-2/9.7.6.2

177 The Group agreed to incorporate the unified interpretation of SOLAS regulation II-2/9.7.3.1.2 on categorization and construction of fan rooms serving engine rooms, as set out in the *Unified interpretations of the revised SOLAS chapter II-2* (MSC.1/Circ.1239), into paragraphs 7.6.1 and 7.6.2.

178 It was noted that the unified interpretation in MSC.1/Circ.1239 is older than the latest amendments to paragraphs 7.6.1 and 7.6.2, but that it provides more details than the current versions of the regulations.

179 One participant did not support the unified interpretation in MSC.1/Circ.1239.

SOLAS regulation II-2/9, tables 9.1 to 9.8

Fire rating of bulkhead between the wheelhouse and toilet inside the wheelhouse

180 The Group agreed that the unified interpretation of SOLAS regulation II-2/9 in the *Unified interpretations of the revised SOLAS chapter II-2* (MSC.1/Circ.1555) related to the bulkhead between the wheelhouse and toilet should be incorporated into tables 9.1, 9.3, 9.5 and 9.7.

181 However, the Group did not consider categories (1/1) to be the appropriate location, and drafted footnotes e/h/k/f for the following locations:

- .1 Table 9.1 (> 36 pax): (1/9), i.e. ("Control station" / "Sanitary and similar spaces")
- .2 Table 9.3 (≤ 36 pax): (1/3), i.e. ("Control station" / "Accommodation spaces")
- .3 Table 9.5 (cargo): (1/3), i.e. ("Control station" / "Accommodation spaces")
- .4 Table 9.7 (tankers): (1/3), i.e. ("Control station" / "Accommodation spaces")

182 The Group was split regarding the preferred text for the footnotes. Two alternatives, including a suggested editorial improvement, were, therefore, included in square brackets in footnotes "e", "h", "k" and "f" of tables 9.1, 9.3, 9.5 and 9.7, respectively, in annex 4 for further consideration.

Fire rating of bulkheads of navigation locker that can only be accessed from the wheelhouse

183 The Group agreed that the unified interpretation of SOLAS regulation II-2/9.2, as set out in the *Unified interpretations of the revised SOLAS chapter II-2* (MSC.1/Circ.1581), related to the fire rating of bulkheads between the wheelhouse and navigation lockers, should be incorporated into tables 9.3, 9.5 and 9.7.

184 To minimize the number of footnotes, the Group has suggested draft amendments to the existing footnote c of table 9.3 and 9.7, and footnote "e" of table 9.5, rather than the proposed new footnotes "i", "l" and "g". The new draft text uses the term "navigation equipment locker" instead of "navigation locker" to enhance clarity.

Fire integrity of the boundaries of ro-ro/vehicles spaces

185 The Group agreed to incorporate the unified interpretations to tables 9.5 and 9.6 in the *Unified interpretations of SOLAS regulations II-2/9 and 13* (MSC.1/Circ.1511/Rev.1), and understanding no.2 of document SSE 7/16/4, into the SOLAS Convention. However, the Group noted that the number of notes to the tables could reduce clarity and explored whether some of the guidance could be included in the regulatory text rather than footnotes to the tables.

186 The Group agreed that unified interpretation 1 on decks and bulkheads could be included as footnote "j" of tables 9.5 and 9.6, as suggested in document SSE 10/17/1. Views were however expressed that the term "single spaces" could be clarified. The term is placed within square brackets in annex 4 for further consideration.

187 The Group considered alternatives for interpretations 2 to 6 of MSC.1/Circ.1511/Rev.1. One alternative was to incorporate interpretation no. 2 (hatches), no.3 (access doors) and no. 4 (movable ramps) into SOLAS regulation II-2/9.4.2, noting that this would imply that the title of the regulation should be changed to "openings in fire divisions", and interpretation no.5 (ventilation ducts) and no.6 (ventilators) into SOLAS regulation II-2/9.7. Another alternative solution could be to establish a new SOLAS regulation II-2/9.2.3.5 on ro-ro and vehicles spaces on cargo ships, since the draft footnotes "m" to "r" are all concerning ro-ro and vehicles spaces.

188 The Group was split regarding the preferred alternatives, also noting that both could be acceptable. The draft new footnotes "m" to "r" of tables 9.5 and 9.6, are placed within square brackets in annex 4 for further consideration.

Draft amendments to SOLAS regulation II-2/3***Definition of "Accommodation spaces" – SOLAS regulation II-2/3.1***

189 The Group agreed to include the unified interpretation of SOLAS regulation II-2/3.1, as set out in MSC.1/Circ.1120, as amended by MSC.1/Circ.1436, into the definition of "accommodation spaces". The unified interpretation also covers SOLAS regulations II-2/9.2.2.3.2.2(9), II-2/9.2.2.4.2.2(3), II-2/9.2.3.3.2.2(3) and II-2/9.2.4.2.2.2(3).

Definition of "Service spaces" – SOLAS regulation II-2/3.45

190 The Group agreed to the proposal to include the first unified interpretation of SOLAS regulation II-2/3.45, as set out in MSC.1/Circ.1120, as amended by MSC.1/Circ.1436, into the definition of "service spaces". The unified interpretation also covers SOLAS regulations II-2/9.2.2.3.2.2(13) and II-2/9.2.2.4.2.2(9).

191 The Group considered the difference between "main pantries" and "pantries containing cooking appliances" to be unclear and agreed to remove the term "main pantries". Draft consequential amendments to SOLAS regulation II-2/9.2.2.3.2.2(13) to remove the term "main pantries" was agreed accordingly.

192 The Group also agreed to incorporate unified interpretation number 2 of MSC.1/Circ.1436 relating to power limitations into SOLAS regulation II-2/3.45 for consistency.

193 The Group has prepared the draft amendments to SOLAS regulation II-2/3, as set out in annex 4.

Other views expressed

Application provisions

194 One participant suggested that, as per the *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments (MSC.1/Circ.1500/Rev.3)*, each amendment to the SOLAS regulations should include an application statement.

195 The Group noted that the purpose of this output is to incorporate existing guidance which was developed to support the SOLAS text, without adding to the intent of the regulations. The Group did not see a need for application provisions in the draft amendments to SOLAS regulations II-2/3 and II-2/9, noting that the unified interpretations are already widely applied and do not change the substance of the regulations. Amendments are in any case not given retroactive effect, unless specified.

196 It was agreed that the need for application provisions should be discussed after the draft amendments have been developed and be considered by SSE 12.

Safeguards for consideration of unified interpretations

197 One participant suggested that the Group should assess whether the individual existing unified interpretations met the new safeguards for consideration of unified interpretations in MSC-MEPC.1/Circ.5/Rev.6. It was further noted that existing unified interpretations which may not meet the safeguards should not be incorporated into SOLAS without technical justification.

198 It was noted that MSC 105 agreed to the output "review and update SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements".

199 The Group agreed that the safeguards in MSC-MEPC.1/Circ.5/Rev.6 have not been given retroactive effect and that the consideration of those safeguards for the individual existing unified interpretations were not specified in the scope of this output.

TOR 4 – DOCUMENT SSE 11/9 – EXPLANATORY FIGURES TO SOLAS REGULATION II-2/9 (AGENDA ITEM 9)

200 The Group agreed to the proposal to compile the explanatory figures that are currently available in various MSC circulars into a new guidance document for SOLAS regulation II-2/9.

201 The following comments were provided regarding the consolidated explanatory figures in the annex of document SSE 11/9:

1. illustrations should be updated, especially those concerning heat transmission on intersections as referred to in MSC.1/Circ.1120 and MSC.1/Circ.1510; and
2. the interpreted SOLAS text should be added to the circular to enhance usability.

202 IACS, as the author of document SSE 11/9, and other interested parties were invited to address the comments in items .1 and .2 above and, as appropriate, provide further clarifications to the draft new consolidated guidance document.

203 The Group also considered whether the figures in the *Guidelines on fire safety construction in accommodation areas* (MSC.1/Circ.917) should be included in such a new circular with explanatory figures, but agreed that this would be useful only if the technical substance of the circular was reviewed and updated. A new output proposal was considered necessary to update the technical content of MSC.1/Circ.917.

204 The Group agreed that the new guidance document with explanatory figures requires further consideration.

TOR 5 – UNIFIED INTERPRETATION OF SOLAS REGULATION II-2/4.2.4 (AGENDA ITEM 10)

205 The Group considered the draft unified interpretation in annex 2 to document SSE 11/WP.5 to clarify that some tanks collecting spillages need not be fitted with a small-diameter self-closing control cock at the termination of the sounding pipes.

206 The unified interpretation was found to not comply with the safeguards in paragraph 4.44 of MSC-MEPC.1/Circ.5/Rev.6 and, therefore, the Group agreed that the proposed clarification should not be resolved through a unified interpretation.

TOR 6 – WORKING ARRANGEMENTS AT SSE 12

207 In view of the progress made intersessionally, the Group recommends that the work continues in a working group at SSE 12.

208 The Group considered whether multiple FP working groups should be established at SSE 12 as a result of the two correspondence groups. However, it was recommended that the fire safety experts convene in a single FP Working Group. This consolidated group would address the outcomes of both the FP correspondence groups and could subsequently consider whether the re-establishment of two FP Correspondence Groups would be efficient to progress work after SSE 12.

209 In view of the above conclusion, the Group has prepared the following draft terms of reference for the FP Working Group, if established, relevant to the agenda items that the Group dealt with:

"The FP Working Group, taking into account comments made, and decisions taken in plenary, is instructed to further consider:

With regard to the 2010 FTP Code [and 2009 MODU Code]

- .1 the draft amendments to the 2010 FTP Code as outlined in annex 2 to document SSE 12/8 to introduce tests for "H" class divisions in annex 1, part 3 of the Code;
- [.2 the draft amendments to paragraph 1.3.26 of the 2009 MODU Code as outlined in annex 3 to document SSE 12/8;] (subject to the outcome of the action in paragraph 210.14);

With regard to SOLAS chapter II-2

- .3 the draft amendments to SOLAS regulations II-2/3 and 9, as set out in annex 4 to document SSE 12/8, in particular:
 - .1 the proposed draft amendments to address "dumb waiters" consistently across all ship types (SSE 12/8, paragraphs 124 to 129);
 - .2 the location of the text in the draft new SOLAS regulation II-2/9.4.1.1.6 on lift door indication signals (SSE 12/8, paragraphs 141 to 144);
 - .3 the need for including the unified interpretation of SOLAS regulation II-2/9.4.1.3.1 on windows and side scuttles, as outlined in MSC.1/Circ.1120, as a footnote in paragraph 4.1.3.1 (SSE 12/8, paragraphs 149 to 151);
 - .4 the draft new SOLAS regulation II-2/9.7.1.1.1, specifying the applicable exposure to the standard fire test for non-steel ventilation ducts to be considered equivalent to steel ducts (SSE 12/8, paragraphs 156 to 161);
 - .5 the editorial correction in SOLAS regulation II-2/9.7.3.2.1 on details of fire dampers and duct penetrations (paragraphs 170 to 171); and
 - .6 the footnotes to tables 9.1 to 9.8 in SOLAS regulation II-2/9 (paragraphs 180 to 188); and
 - .7 the relevance of the existing circulars listed in table 1 of document MSC 104/15/2 to determine whether they should be maintained, revised or revoked, as appropriate, following the adoption of the draft amendments to SOLAS chapter II-2.
- .4 any necessary updates to the draft new MSC circular compiling the explanatory figures currently available in various MSC circulars (paragraphs 200 to 204).

Action requested by the Sub-Committee

210 The Sub-Committee is invited to approve the report in general and, in particular, to:

With regard to agenda item 8

- .1 consider the draft amendments to the 2010 FTP Code to introduce tests for plastic pipes in its annex 1, part 6 (paragraphs 4 to 9 and annex 1);

- .2 note that the Group did not consider SOLAS regulation II-2/9.3.1 to be an appropriate location for addressing the application of plastic pipes (paragraphs 10 to 12);
- .3 endorse the Group's view that the unified interpretation of SOLAS regulation II-2/9.3.1 in MSC.1/Circ.1120 has served its purpose and become obsolete after the adoption of the 2010 FTP Code (paragraph 13);
- .4 note the Group's indicative input for the interested parties who may wish to develop a new output proposal concerning the introduction of mandatory requirements for the application of plastic pipes (paragraphs 14 to 15);
- .5 note the efforts by the Group to identify the justification and rationale behind the proposals in documents SSE 11/8/1 and SSE 11/8/2 (paragraphs 16 to 19, and 52 to 54);
- .6 endorse the Group's view that draft amendments to the 2010 FTP Code should be developed for the following fire protection systems, as proposed in document SSE 11/8/1, noting that the Group found these proposals to be within the scope of the output and supported them from a technical perspective:
 - .1 multipurpose penetrations/transits (paragraphs 26 and 27); and
 - .2 horizontal A-class hatches (paragraphs 28 and 29);
- .7 invite interested delegations to submit specific proposals for draft amendments to the 2010 FTP Code to further develop the proposals in sub-paragraph .6 above (paragraphs 26 and 28);
- .8 consider the Group's discussion on whether the remaining proposals in the annex to document SSE 11/8/1 fall outside the scope of the output (paragraphs 20 to 25 and 30 to 50);
- .9 request the Secretariat to indicate the appendix numbers in the header in the next publication of the Code to enhance its usability (paragraphs 34 and 35);
- .10 consider the Group's discussion on whether the proposals in the annex to document SSE 11/8/2 fall outside the scope of the output (paragraphs 55 to 69);
- .11 note the consideration of the Group on the additional areas of future discussion in paragraph 7 of document SSE 11/8/2 (paragraphs 71 to 79);
- .12 note the Group's discussion on scope and clarify whether the output allows for updates to the 2010 FTP Code that are not related to new systems and materials (paragraphs 80 to 84);
- .13 consider the draft amendments to the 2010 FTP Code to introduce tests for "H" class divisions in its annex 1, part 3 of the Code (paragraphs 86 to 93 and annex 2);
- .14 consider whether consequential draft amendments to paragraph 1.3.26 of the 2009 MODU Code could be considered under the scope of this output (paragraph 94);

-
- .15 subject to sub-paragraph .13 above, consider the draft amendments to paragraph 1.3.26 of the 2009 MODU Code (paragraphs 94 to 95 and annex 3);

With regard to agenda item 9

- .16 note the progress made on the review and update of SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements, and consider:
- .1 the draft amendments to SOLAS regulation II-2/9 (paragraphs 99 to 179 and annex 4);
 - .2 whether MSC.1/Circ.917 should be referenced in SOLAS regulation II-2/9.2.2.2.3 at this stage, noting that the Group considered the guidance to require review and update (paragraphs 104 to 106);
 - .3 whether the proposed draft amendments to address "dumb waiters" consistently across all ship types could be considered as consequential draft amendments under this output (paragraphs 124 to 129);
 - .4 the review and update of the footnotes to tables 9.1 to 9.8 in SOLAS regulation II-2/9 (paragraphs 180 to 188 and annex 4);
 - .5 the draft amendments to SOLAS regulation II-2/3 (paragraphs 189 to 193 and annex 4); and
 - .6 the Group's initial considerations on the need for application provisions for the individual draft amendments to SOLAS regulations II-2/3 and 9 (paragraph 106);
- .17 endorse the Group's view that the unified interpretations of SOLAS regulation II-2/9.3.1 in MSC.1/Circ.1203, and SOLAS regulations II-2/9.4.1.1.8 and 9.7.3.1.2 in MSC.1/Circ.1120, have served their purpose and become obsolete (paragraphs 13, 131 and 132, 163 to 165 and 167 to 169);
- .18 agree that the safeguards established in MSC-MEPC.1/Circ.5/Rev.6 do not have retroactive effect and that application of those safeguards to existing unified interpretations is not expected under the scope of the output on "Review and update of SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements" (paragraphs 197 to 199);
- .19 agree that a new output proposal would be necessary for the update of the technical content of MSC.1/Circ.917 on *Guidelines on fire safety construction in accommodation areas* (paragraphs 200 to 204);

With regard to the unified interpretation of SOLAS regulation II-2/4.2.4

- .20 note the Group's agreement that the draft unified interpretation in annex 2 to document SSE 11/WP.5 does not comply with the safeguards established in paragraph 4.44 of MSC-MEPC.1/Circ.5/Rev.6 (paragraphs 205 to 206);

With regard to the working arrangements at SSE 12

- .21 note the recommendation for a single fire protection working group at SSE 12 (paragraph 208); and
- .22 establish the fire protection working group to progress the work, with the draft terms of reference prepared by the Group (paragraph 209).

ANNEX 1*

DRAFT AMENDMENTS TO THE 2010 FTP CODE (RESOLUTION MSC.307(88))

CONTENTS

Part 6 Tests for plastic pipes (blank)*

* This part was intentionally left blank. Part 6 of the previous FTP Code, adopted by resolution MSC.61(67), has been incorporated into part 5 of this Code.

ANNEX 1

FIRE TEST PROCEDURES

Part 6 – Tests for plastic pipes

The fire testing of plastic pipes should be carried out taking into account the Guidelines developed by the Organization.*

* Refer to paragraph 2.2 of the *Guidelines for the use of plastic pipes on ships* (resolution A.753(18)), as amended by resolutions MSC.313(88) and MSC.399(95).

* Modifications in grey shading.

ANNEX 2*

DRAFT AMENDMENTS TO THE 2010 FTP CODE (RESOLUTION MSC.307(88))

ANNEX 1

FIRE TEST PROCEDURES

Part 3 – Test for "A", "B" and, "F" and "H" class divisions

1 APPLICATION

Where products (such as decks, bulkheads, doors, ceilings, linings, windows, fire dampers, pipe penetrations and cable transits) are required to be "A" or "B" or "F" or "H" class divisions*, they shall comply with this part.

* As defined in the International Convention for the Safety of Life at Sea, 1974, chapter II-2, part A, and the Torremolinos Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, chapter V. "F" class divisions are defined only in the latter Convention. "H" class divisions are defined in the Code for Construction and Equipment of Mobile Offshore Drilling Units, as amended by resolution MSC.435(98), chapter 1.

[1.1 Unless otherwise specified, tests for "H" class divisions shall comply with the same requirements as applicable to "A" class divisions.]

[...]

3 PERFORMANCE CRITERIA

3.1 Insulation

[...]

3.1.3 "H" class divisions, including "H" class doors

The average unexposed-face temperature rise as determined in accordance with paragraph 8.4.1 of appendix 1, shall not be more than 140°C, and the temperature rise recorded by any of the individual unexposed-face thermocouples shall not be more than 180°C during the periods given below for each classification:

class "H-120" 120 min

class "H-60" 60 min

class "H-0" 0 min.

* Modifications are provided in grey shading. Text requiring further consideration is in red shading and between square brackets.

Appendix 1

Fire resistance test procedures for "A", "B" and, "F" and "H" class divisions

8 METHOD OF TEST

8.3 Furnace control

8.3.1 Furnace temperature

8.3.1.1 [For the standard heating curve, T] the average temperature of the furnace as derived from the furnace thermocouples specified in paragraph 7.3 shall be monitored and controlled such that it follows the relationship [(i.e. the standard heating curve)]:

$$T = 345 \log_{10}(8t+1) + 20$$

where:

T is the average furnace temperature ($^{\circ}\text{C}$),
 t is the time (min).

8.3.1.2 The following points are defined by the above relationship in paragraph 8.3.1.1:

.1	at the end of the first 5 min	576 $^{\circ}\text{C}$;
.2	at the end of the first 10 min	679 $^{\circ}\text{C}$;
.3	at the end of the first 15 min	738 $^{\circ}\text{C}$;
.4	at the end of the first 30 min	841 $^{\circ}\text{C}$; and
.5	at the end of the first 60 min	945 $^{\circ}\text{C}$.

8.3.1.3 The percentage deviation 'd' in the area of the curve of the average temperature [, as defined in paragraph 8.3.1.1,] recorded by the specified furnace thermocouples versus time from the area of the standard heating curve shall be within:

$\pm 15\%$	from $t = 0$ to 10	1)
$\pm (15-0.5(t-10))\%$	from $t = 10$ to 30	(2)
$\pm (5-0.083(t-30))\%$	from $t = 30$ to 60	(3)
$\pm 2.5\%$	from $t = 60$ and over	(4)

where:

$$d = (A - A_s) \times 1/A_s \times 100, \text{ and}$$

A is the area under the actual average furnace time-temperature curve; and

A_s is the area under the standard time-temperature curve.

All areas shall be computed by the same method, i.e. by the summation of areas at intervals not exceeding 1 min.

8.3.1.4 At any time after the first 10 min of test, the temperature recorded by any thermocouple shall not differ from the corresponding temperature of the standard time-temperature curve by more than $\pm 100^{\circ}\text{C}$.

8.3.1.5 [For the hydrocarbon heating curve, ~~t~~] the average temperature of the furnace as derived from the furnace thermocouples specified in paragraph 7.3 shall be monitored and controlled such that it follows the relationship [(i.e. the hydrocarbon heating curve)]:

$$T(t) = 20 + 1080(1 - 0.325e^{-0.167t} - 0.675e^{-2.5t})$$

8.3.1.6 The following points are defined by the relationship in paragraph 8.3.1.5:

.1	at the end of the first 5 min	948°C;
.2	at the end of the first 10 min	1034°C;
.3	at the end of the first 15 min	1071°C;
.4	at the end of the first 30 min	1098°C
.5	at the end of the first 60 min	1100°C; and
.6	at the end of the first 120 min	1100°C.

[8.3.1.7 The percentage deviation 'd_e' in the area of the curve of the average temperature, as defined in paragraph 8.3.1.6, recorded by the specified furnace thermocouples versus time from the area of the hydrocarbon heating curve shall be within:

$\pm 15\%$	from t = 5 to 10	(1)
$\pm (15-0.5(t-10))\%$	from t = 10 to 30	(2)
$\pm (5-0.083(t-30))\%$	from t = 30 to 60	(3)
$\pm 2.5\%$	from t = 60 and over	(4)

where:

$d_e = (A - A_s) \times 1/A_s \times 100$, and

d_e is the percentage deviation;

A is the area under the actual furnace time-temperature curve;

A_s is the area under the hydrocarbon time-temperature curve; and

t is the time in minutes.

All areas shall be computed by the same method, i.e. by the summation of areas at intervals not exceeding 1 min and shall be calculated from time zero.]

[8.3.1.8 At any time after the first 10 min of test, the temperature recorded by any thermocouple shall not differ from the corresponding temperature of the hydrocarbon time-temperature curve by more than $\pm 100^{\circ}\text{C}$.]

8.5 Duration of testing

8.5.1 "A" and "H" class divisions

For all "A" class divisions, including those with doors, the test shall continue for a minimum of 60 min. However, when the specimen is of an "A" class division, with a structural steel core which is imperforate (e.g., without a door), and where insulation is provided to the exposed face only (i.e. the structural steel core is the unexposed face of the construction), it is permitted to terminate the test prior to 60 min once the unexposed-face temperature-rise limits have been exceeded. For all "H" class divisions, including those with doors, the test shall continue for a minimum of 120 min."

ANNEX 3*

DRAFT AMENDMENTS TO THE 2009 MODU CODE

CHAPTER 1

GENERAL

1.3 Definitions

[1.3.26 'H' class divisions are those divisions which meet the same requirements as "A" class divisions, as defined in SOLAS regulation II-2/3, except that, when tested according to the Fire Test Procedures Code, the furnace control temperature curve is replaced with the furnace control temperature curve for hydrocarbon fires defined in national or international standards.⁴

"H" class divisions are those divisions formed by bulkheads and decks which comply with the following criteria:

.1 they are constructed of steel or other equivalent material;

.2 they are suitably stiffened;

.3 they are insulated with approved non-combustible materials such that the average temperature of the unexposed side, when exposed to a hydrocarbon fire test, will not rise more than 140°C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180°C above the original temperature, within the time listed below:

class "H-120" 120 min

class "H-60" 60 min

class "H-0" 0 min.

.4 they are so constructed as to be capable of preventing the passage of smoke and flame to the end of the two-hour hydrocarbon fire test; and

.5 the Administration required a test of a prototype bulkhead or deck in accordance with the Fire Test Procedures Code to ensure that it meets the above requirements for integrity and temperature rise.]

[* ——— Refer to national standards such as: BS EN 1363-2:1999 Fire resistance tests. Alternative and additional procedures; or ASTM 1529-14a Standard Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies; or ISO/DIS 20902-1 Fire test procedures for divisional elements that are typically used in oil, gas and petrochemical industries—Part 1: General requirements.—]

[...]

* Modifications are provided in grey shading.

ANNEX 4*

DRAFT AMENDMENTS TO SOLAS REGULATION II-2/3 and II-2/9

CHAPTER II-2

CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

PART A GENERAL

PART C SUPPRESSION OF FIRE

Regulation 3 Definitions

1 "Accommodation spaces" are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, game and hobby rooms, barber shops, pantries or isolated pantries containing no cooking appliances and similar spaces.

1.1 Pantries or isolated pantries containing no cooking appliances may contain:

- .1 toasters, microwave ovens, induction heaters and similar appliances each of them with a maximum power of 5 kW;
- .2 electrically heated cooking plates and hot plates for keeping food warm each of them with a maximum power of 2 kW and a surface temperature not above 150°C; and
- .3 coffee machines, dish washers and water boilers with no exposed hot surfaces regardless of their power.

A dining room containing such appliances is not regarded as a pantry.

45 "Service spaces" are those spaces used for galleys, pantries containing cooking appliances, lockers, mail and specie rooms, storerooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces.

45.1 Pantries containing cooking appliances may contain:

- .1 toasters, microwave ovens, induction heaters and similar appliances each of them with a power of more than 5 kW;
- .2 electrically heated cooking plates and hot plates for keeping food warm each of them with a maximum power of 5 kW; and
- .3 coffee machines, dish washers and water boilers with no exposed hot surfaces regardless of their power.

Spaces containing any electrically heated cooking plate or hot plate for keeping food warm with a power of more than 5 kW shall be regarded as galleys.

* Modifications are provided in grey shading. Text requiring further consideration is in red shading and between square brackets.

Regulation 9 Containment of fire

1 Purpose

The purpose of this regulation is to contain a fire in the space of origin. For this purpose, the following functional requirements shall be met:

- .1 the ship shall be subdivided by thermal and structural boundaries;
- .2 thermal insulation of boundaries shall have due regard to the fire risk of the space and adjacent spaces; and
- .3 the fire integrity of the divisions shall be maintained at openings and penetrations.

2 Thermal and structural boundaries

2.1 Thermal and structural subdivision

Ships of all types shall be subdivided into spaces by thermal and structural divisions having regard to the fire risks of the space.

2.2 Passenger ships

2.2.1 Main vertical zones and horizontal zones

2.2.1.1.1 In ships carrying more than 36 passengers, the hull, superstructure and deckhouses shall be subdivided into main vertical zones by "A-60" class divisions. Steps and recesses shall be kept to a minimum, but where they are necessary they shall also be "A-60" class divisions. Where a category (5), (9) or (10) space defined in paragraph 2.2.3.2.2 is on one side or where fuel oil tanks are on both sides of the division the standard may be reduced to "A-0".

2.2.1.1.2 In ships carrying not more than 36 passengers, the hull, superstructure and deckhouses in way of accommodation and service spaces shall be subdivided into main vertical zones by "A" class divisions. These divisions shall have insulation values in accordance with tables in paragraph 2.2.4.

2.2.1.2 As far as practicable, the bulkheads forming the boundaries of the main vertical zones above the bulkhead deck shall be in line with watertight subdivision bulkheads situated immediately below the bulkhead deck. The length and width of main vertical zones may be extended to a maximum of 48 m in order to bring the ends of main vertical zones to coincide with watertight subdivision bulkheads or in order to accommodate a large public space extending for the whole length of the main vertical zone provided that the total area of the main vertical zone is not greater than 1,600 m² on any deck. The length or width of a main vertical zone is the maximum distance between the furthestmost points of the bulkheads bounding it.

2.2.1.3 Such bulkheads shall extend from deck to deck and to the shell or other boundaries.

2.2.1.3.1 If a stairway serves two main vertical zones, the maximum length of one main vertical zone shall be measured from the far side of the main vertical zone stairway enclosure. In this case, all boundaries of the stairway enclosure shall be insulated as main vertical zone bulkheads and access doors leading into the stairway shall be provided from the zones. However, the stairway shall not be included in calculating the size of the main vertical zone if it is treated as its own main vertical zone.*

* (Refer to figures in a new MSC circular, proposed to be developed).

2.2.1.4 Where a main vertical zone is subdivided by horizontal "A" class divisions into horizontal zones for the purpose of providing an appropriate barrier between a zone with sprinklers and a zone without sprinklers, the divisions shall extend between adjacent main vertical zone bulkheads and to the shell or exterior boundaries of the ship and shall be insulated in accordance with the fire insulation and integrity values given in table 9.4.

2.2.1.5.1 On ships designed for special purposes, such as automobile or railroad car ferries, where the provision of main vertical zone bulkheads would defeat the purpose for which the ship is intended, equivalent means for controlling and limiting a fire shall be substituted and specifically approved by the Administration. Service spaces and ship stores shall not be located on ro-ro decks unless protected in accordance with the applicable regulations.

2.2.1.5.2 However, in a ship with special category spaces, such spaces shall comply with the applicable provisions of regulation 20 and where such compliance would be inconsistent with other requirements for passenger ships specified in this chapter, the requirements of regulation 20 shall prevail.

2.2.2 Bulkheads within a main vertical zone

2.2.2.1 For ships carrying more than 36 passengers, bulkheads which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in paragraph 2.2.3.

2.2.2.2 For ships carrying not more than 36 passengers, bulkheads within accommodation and service spaces which are not required to be "A" class divisions shall be at least "B" class or "C" class divisions as prescribed in the tables in paragraph 2.2.4. In addition, corridor bulkheads, where not required to be "A" class, shall be "B" class divisions which shall extend from deck to deck except:

- .1 when continuous "B" class ceilings or linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining shall be of material which, in thickness and composition, is acceptable in the construction of "B" class divisions, ~~but which shall be required to meet "B" class integrity standards only insofar as is reasonable and practicable in the opinion of the Administration~~. The extension of the bulkhead shall be made of non-combustible material and the construction of the extension shall correspond to the fire class of the extended bulkhead. If the extended bulkhead is B-0 class, then the extension shall be made of:
 - .1 thin steel plates of at least 1 mm thickness and tightened (e.g. with mineral wool), or
 - .2 B-0 class extensions constructed of a suitably supported mineral wool (density at least 100 kg/m³, thickness at least 50 mm), or
 - .3 alternative non-combustible supported material, if proven suitable for the construction of B class divisions; and
- .2 in the case of a ship protected by an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code, the corridor bulkheads may terminate at a ceiling in the corridor provided such bulkheads and ceilings are of "B" class standard in compliance with paragraph 2.2.4. All doors and frames in such bulkheads shall be of non-combustible materials and shall have the same fire integrity as the bulkhead in which they are fitted.

2.2.2.3 Bulkheads required to be "B" class divisions, except corridor bulkheads as prescribed in paragraph 2.2.2.2, shall extend from deck to deck and to the shell or other boundaries. However, where a continuous "B" class ceiling or lining is fitted on both sides of a bulkhead which is at least of the same fire resistance as the adjoining bulkhead, the bulkhead may terminate at the continuous ceiling or lining. *

[* Refer to the *Guidelines on fire safety construction in accommodation areas* (MSC/Circ.917).]

2.2.3 Fire integrity of bulkheads and decks in ships carrying more than 36 passengers

2.2.3.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks of passenger ships, the minimum fire integrity of all bulkheads and decks shall be as prescribed in tables 9.1 and 9.2. Where, due to any particular structural arrangements in the ship, difficulty is experienced in determining from the tables the minimum fire integrity value of any divisions, such values shall be determined to the satisfaction of the Administration.

2.2.3.2 The following requirements shall govern application of the tables:

- .1 Table 9.1 shall apply to bulkheads not bounding either main vertical zones or horizontal zones. Table 9.2 shall apply to decks not forming steps in main vertical zones nor bounding horizontal zones;
- .2 For determining the appropriate fire integrity standards to be applied to boundaries between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (14) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed rooms within a space that have less than 30% communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.1 and 9.2. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.
 - (1) *Control stations*
Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire control stations.
Control room for propulsion machinery when located outside the propulsion machinery space.
Spaces containing centralized fire alarm equipment.
Spaces containing centralized emergency public address system stations and equipment.
 - (2) *Stairways*
Interior stairways, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) for passengers and crew and enclosures thereto.
In this connection a stairway which is enclosed at only one level shall be regarded as part of the space from which it is not separated by a fire door.

(3) *Corridors*
Passenger and crew corridors and lobbies.

(4) *Evacuation stations and external escape routes*
Survival craft stowage area.
Open deck spaces and enclosed promenades forming lifeboat and liferaft embarkation and lowering stations.
Assembly stations, internal and external.
External stairs and open decks used for escape routes.
The ship's side to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to the liferaft and evacuation slide embarkation areas.

(5) *Open deck spaces*
Open deck spaces and enclosed promenades clear of lifeboat and liferaft embarkation and lowering stations. To be considered in this category, enclosed promenades shall have no significant fire risk, meaning that furnishings shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings.
Air spaces (the space outside superstructures and deckhouses).

(6) *Accommodation spaces of minor fire risk*
Cabins containing furniture and furnishings of restricted fire risk. Offices and dispensaries containing furniture and furnishings of restricted fire risk.
Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of less than 50 m².

(7) *Accommodation spaces of moderate fire risk*
Spaces as in category (6) above but containing furniture and furnishings of other than restricted fire risk.
Public spaces containing furniture and furnishings of restricted fire risk and having a deck area of 50 m² or more.
Isolated lockers and small store-rooms in accommodation spaces having areas less than 4 m² (in which flammable liquids are not stowed).
Motion picture projection and film stowage rooms.
Diet kitchens (containing no open flame) and arranged in compliance with the definition of pantries containing no cooking appliances in regulation 3.1).
Cleaning gear lockers (in which flammable liquids are not stowed).
Laboratories (in which flammable liquids are not stowed).
Pharmacies.
Small drying rooms (having a deck area of 4 m² or less).
Specie rooms.
Operating rooms.
Spaces containing electrical distribution boards, having a deck area of 4 m² or less.

(8) *Accommodation spaces of greater fire risk*
Public spaces containing furniture and furnishings of other than restricted fire risk and having a deck area of 50 m² or more.
Barber shops and beauty parlours.
Saunas.
Sale shops.

(9) Sanitary and similar spaces

Communal sanitary facilities, showers, baths, water closets, etc.

Small laundry rooms.

Indoor swimming pool area.

Private sanitary facilities shall be considered a portion of the space in which they are located.

Isolated pantries containing no cooking appliances in accommodation spaces. To be considered in this category, the isolated pantries are to be enclosed in an accommodation space and are only accessible from accommodation spaces and/or open deck. These pantries shall not have communicating openings to spaces other than accommodation spaces, such as a category (12), main galley. (Refer to figure in new MSC circular).

~~Private sanitary facilities shall be considered a portion of the space in which they are located.~~

(10) Tanks, voids and auxiliary machinery spaces having little or no fire risk

Water tanks forming part of the ship's structure.

Voids and cofferdams.

Auxiliary machinery spaces which do not contain machinery having a pressure lubrication system and where storage of combustibles is prohibited, such as:

ventilation and air-conditioning rooms; windlass room; steering gear room; stabilizer equipment room; electrical propulsion motor room; rooms containing section switchboards and purely electrical equipment other than oil-filled electrical transformers (above 10 kVA); shaft alleys and pipe tunnels; spaces for pumps and refrigeration machinery (not handling or using flammable liquids).

Spaces separated from the engine-room 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.

Closed trunks serving the spaces listed above.

Other closed trunks such as pipe and cable trunks.

(11) Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk

Cargo oil tanks.

Cargo holds, trunkways and hatchways.

Refrigerated chambers.

Oil fuel tanks (where installed in a separate space with no machinery).

Shaft alleys and pipe tunnels allowing storage of combustibles. Auxiliary machinery spaces as in category (10) which contain machinery having a pressure lubrication system or where storage of combustibles is permitted.

Oil fuel filling stations.

Spaces containing oil-filled electrical transformers (above 10 kVA).

Spaces containing turbine and reciprocating steam engine driven auxiliary generators and small internal combustion engines of power

output up to 110 kW driving generators, sprinkler, drencher or fire pumps, bilge pumps, etc.
Closed trunks serving the spaces listed above.

(12) *Machinery spaces and main galleys*

Main propulsion machinery rooms (other than electric propulsion motor rooms) and boiler rooms.
Auxiliary machinery spaces other than those in categories (10) and (11) which contain internal combustion machinery or other oil-burning, heating or pumping units.
Main galleys and annexes.
Trunks and casings to the spaces listed above.

(13) *Store-rooms, workshops, pantries, etc.*

Main pantries containing cooking appliances, not annexed to galleys.
Main laundry.
Large drying rooms (having a deck area of more than 4 m²)
Miscellaneous stores.
Mail and baggage rooms.
Garbage rooms.
Workshops (not part of machinery spaces, galleys, etc.).
Lockers and store-rooms having areas greater than 4 m², other than those spaces that have provisions for the storage of flammable liquids.

(14) *Other spaces in which flammable liquids are stowed*

Paint lockers.
Store-rooms containing flammable liquids (including dyes, medicines, etc.).
Laboratories (in which flammable liquids are stowed);

- .3 Where a single value is shown for the fire integrity of a boundary between two spaces, that value shall apply in all cases;
- .4 Notwithstanding the provisions of paragraph 2.2.2 there are no special requirements for material or integrity of boundaries where only a dash appears in the tables; and
- .5 The Administration shall determine in respect of category (5) spaces whether the insulation values in table 9.1 shall apply to ends of deckhouses and superstructures, and whether the insulation values in table 9.2 shall apply to weather decks. In no case shall the requirements of category (5) of tables 9.1 or 9.2 necessitate enclosure of spaces which in the opinion of the Administration need not be enclosed.
- .6 Electrical distribution boards may be located behind panels/linings within accommodation spaces, including stairway enclosures, provided the space is not designed, intended or used for storage of any kind.

Table 9.1 – Bulkheads not bounding either main vertical zones or horizontal zones

Spaces		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations	(1)	B-0 ^a	A-0	A-0	A-0	A-0	A-60	A-60	A-60	A-0 ^e	A-0	A-60	A-60	A-60	A-60
Stairways	(2)		A-0 ^a	A-0	A-0	A-0	A-0	A-15	A-15	A-0 ^c	A-0	A-15	A-30	A-15	A-30
Corridors	(3)			B-15	A-60	A-0	B-15	B-15	B-15	B-15	A-0	A-15	A-30	A-0	A-30
Evacuation stations and external escape routes	(4)					A-0	A-60 ^{b,d}	A-60 ^{b,d}	A-60 ^{b,d}	A-0 ^d	A-0	A-60 ^b	A-60 ^b	A-60 ^b	A-60 ^b
Open deck spaces	(5)						A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk	(6)						B-0	B-0	B-0	C	A-0	A-0	A-30	A-0	A-30
Accommodation spaces of moderate fire risk	(7)							B-0	B-0	C	A-0	A-15	A-60	A-15	A-60
Accommodation spaces of greater fire risk	(8)								B-0	C	A-0	A-30	A-60	A-15	A-60
Sanitary and similar spaces	(9)									C	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)										A-0 ^a	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)											A-0 ^a	A-0	A-0	A-15
Machinery spaces and main galleys	(12)												A-0 ^a	A-0	A-60
Store-rooms, workshops, pantries etc.	(13)													A-0 ^a	A-0
Other spaces in which flammable liquids are stored	(14)														A-30

Table 9.2 – Decks not forming steps in main vertical zones nor bounding horizontal zones

Spaces Above Below		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Control stations	(1)	A-30	A-30	A-15	A-0	A-0	A-0	A-15	A-30	A-0	A-0	A-0	A-60	A-0	A-60
Stairways	(2)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-30	A-0	A-30
Corridors	(3)	A-15	A-0	A-0 ^a	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-30	A-0	A-30
Evacuation stations and external escape routes	(4)	A-0	A-0	A-0	A-0	-	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Open deck spaces	(5)	A-0	A-0	A-0	A-0	-	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of minor fire risk	(6)	A-60	A-15	A-0	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of moderate fire risk	(7)	A-60	A-15	A-15	A-60	A-0	A-0	A-15	A-15	A-0	A-0	A-0	A-0	A-0	A-0
Accommodation spaces of greater fire risk	(8)	A-60	A-15	A-15	A-60	A-0	A-15	A-15	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Sanitary and similar spaces	(9)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Tanks, voids and auxiliary machinery spaces having little or no fire risk	(10)	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0a	A-0	A-0	A-0	A-0
Auxiliary machinery spaces, cargo spaces, cargo and other oil tanks and other similar spaces of moderate fire risk	(11)	A-60	A-60	A-60	A-60	A-0	A-0	A-15	A-30	A-0	A-0	A-0a	A-0	A-0	A-30
Machinery spaces and main galleys	(12)	A-60	A-60	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0	A-30	A-30 ^a	A-0	A-60
Store-rooms, workshops, pantries etc.	(13)	A-60	A-30	A-15	A-60	A-0	A-15	A-30	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Other spaces in which flammable liquids are stored	(14)	A-60	A-60	A-60	A-60	A-0	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0

Notes: To be applied to tables 9.1 and 9.2, as appropriate

- a Where adjacent spaces are in the same numerical category and superscript "a" appears, a bulkhead or deck between such spaces need not be fitted if deemed unnecessary by the Administration. For example, in category (12) a bulkhead need not be required between a galley and its annexed pantries provided the pantry bulkhead and decks maintain the integrity of the galley boundaries. A bulkhead is, however, required between a galley and machinery space even though both spaces are in category (12).
- b The ship's side, to the waterline in the lightest seagoing condition, superstructure and deckhouse sides situated below and adjacent to liferafts and evacuation slides may be reduced to "A-30".
- c Where public toilets are installed completely within the stairway enclosure, the public toilet bulkhead within the stairway enclosure can be of "B" class integrity.
- d Where spaces of categories (6), (7), (8) and (9) are located completely within the outer perimeter of the assembly station, the bulkheads of these spaces are allowed to be of "B-0" class integrity. Control positions for audio, video and light installations may be considered as part of the assembly station.
- e [A bulkhead separating the wheelhouse and the toilet, **[when]** installed completely within the wheelhouse may have a "C" class fire rating.]
[Where toilets are installed completely within the wheelhouse, the toilet bulkhead within the wheelhouse can be of "C" class integrity.]

2.2.3.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing wholly or in part, to the required insulation and integrity of a division.

2.2.3.4 Construction and arrangement of saunas

2.2.3.4.1 The perimeter of the sauna shall be of "A" class boundaries and may include changing rooms, showers and toilets. The sauna shall be insulated to A-60 standard against other spaces except those inside of the perimeter and spaces of categories (5), (9) and (10).

2.2.3.4.2 Bathrooms with direct access to saunas may be considered as part of them. In such cases, the door between sauna and the bathroom need not comply with fire safety requirements.

2.2.3.4.3 The traditional wooden lining on the bulkheads and ceiling are permitted in the sauna. The ceiling above the oven shall be lined with a non-combustible plate with an air gap of at least 30 mm. The distance from the hot surfaces to combustible materials shall be at least 500 mm or the combustible materials shall be protected (e.g. non-combustible plate with an air gap of at least 30 mm).

2.2.3.4.4 The traditional wooden benches are permitted to be used in the sauna.

2.2.3.4.5 The sauna door shall open outwards by pushing.

2.2.3.4.6 Electrically heated ovens shall be provided with a timer.

2.2.4 ***Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers***

2.2.4.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks of passenger ships, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 9.3 and 9.4.

2.2.4.2 The following requirements govern application of the tables:

- .1 Tables 9.3 and 9.4 shall apply respectively to the bulkheads and decks separating adjacent spaces;
- .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed rooms within a space that have less than 30 % communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.3 and 9.4. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables.

(1) Control stations

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.
Fire control stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.

(2) Corridors

Passenger and crew corridors and lobbies.

(3) Accommodation spaces

Spaces as defined in regulation 3.1 excluding corridors.

(4) Stairways

Interior stairways, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries.

Spaces containing electrical distribution boards, having a deck area of 4 m² or less.

(6) Machinery spaces of category A

Spaces as defined in regulation 3.31.

(7) Other machinery spaces

Electrical equipment rooms (auto-telephone exchange, air-conditioning duct spaces).

Spaces as defined in regulation 3.30 excluding machinery spaces of category A.

Spaces separated from the engine-room 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.

(8) Cargo spaces

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces, other than special category spaces.

(9) Service spaces (high risk)

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, saunas and workshops other than those forming part of the machinery spaces.

(10) Open decks

Open deck spaces and enclosed promenades having little or no fire risk.

Enclosed promenades should have no significant fire risk, meaning that furnishing should be restricted to deck furniture. In addition, such spaces should be naturally ventilated by permanent openings.

Air spaces (the space outside superstructures and deckhouses).

(11) *Special category and ro-ro spaces*

Spaces as defined in regulation 3.41 and 3.46;

- .3 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is not protected by an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code or between such zones neither of which is so protected, the higher of the two values given in the tables shall apply; and
- .4 In determining the applicable fire integrity standard of a boundary between two spaces within a main vertical zone or horizontal zone which is protected by an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code or between such zones both of which are so protected, the lesser of the two values given in the tables shall apply. Where a zone with sprinklers and a zone without sprinklers meet within accommodation and service spaces, the higher of the two values given in the tables shall apply to the division between the zones.
- .5 Electrical distribution boards may be located behind panels/linings within accommodation spaces, including stairway enclosures, provided the space is not designed, intended or used for storage of any kind.

2.2.4.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

2.2.4.4 External boundaries which are required in regulation 11.2 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries of passenger ships to have "A" class integrity. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be constructed of materials which are to the satisfaction of the Administration.

2.2.4.5 Saunas shall comply with paragraph 2.2.3.4, except that space categories mentioned in paragraph 9.2.2.3.4.1 shall be replaced by (5), (7) and (10).

Table 9.3 – Fire integrity of bulkheads separating adjacent spaces

Spaces		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations	(1)	A-0 ^c ⁱ	A-0	A-60 ^h	A-0	A-15	A-60	A-15 ⁱ	A-60	A-60	*	A-60
Corridors	(2)		C ^e	B-0 ^e	A-0 ^a B-0 ^e	B-0 ^e	A-60	A-0	A-0	A-15 A-0 ^d	*	A-30 ^g
Accommodation spaces	(3)			C ^e	A-0 ^a B-0 ^e	B-0 ^e	A-60	A-0	A-0	A-15 A-0 ^d	*	A-30 A-0 ^d
Stairways	(4)				A-0 ^a B-0 ^e	A-0 ^a B-0 ^e	A-60	A-0	A-0	A-15 A-0 ^d	*	A-30 ^g
Service spaces (low risk)	(5)					C ^e	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A	(6)						*	A-0	A-0	A-60	*	A-60
Other machinery spaces	(7)							A-0 ^b	A-0	A-0	*	A-0
Cargo spaces	(8)								*	A-0	*	A-0
Service spaces (high risk)	(9)									A-0 ^b	*	A-30
Open decks	(10)											A-0
Special category and ro-ro spaces	(11)											A-30 ^g

Table 9.4 – Fire integrity of decks separating adjacent spaces

Spaces Below	Above	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-60 ^g
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 ^g
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0 ^d
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-30 ^g
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-60 ^f	A-30	A-60	*	A-60
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces	(8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk)	(9)	A-60	A-30 A-0 ^d	A-30 A-0 ^d	A-30 A-0 ^d	A-0	A-60	A-0	A-0	A-0	*	A-30
Open decks	(10)	*	*	*	*	*	*	*	*	*	-	A-0
Special category and ro-ro spaces	(11)	A-60	A-30 ^g	A-30 A-0 ^d	A-30 ^g	A-0	A-60 ^g	A-0	A-0	A-30	A-0	A-30 ^g

Notes: To be applied to both tables 9.3 and 9.4 as appropriate.

- a For clarification as to which applies, see paragraphs 2.2.2 and 2.2.5.
- b Where spaces are of the same numerical category and superscript b appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, (e.g. in category (9)). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- c Bulkheads separating the wheelhouse, chartroom, ~~and radio room~~ and navigation equipment lockers from each other may have a "B-0" rating. No fire rating is required for those partitions separating the navigation bridge and the safety centre when the latter is within the navigation bridge.
- d See paragraphs 2.2.4.2.3 and 2.2.4.2.4.
- e For the application of paragraph 2.2.1.1.2, "B-0" and "C", where appearing in table 9.3, shall be read as "A-0".
- f Fire insulation need not be fitted if the machinery space in category (7) is equivalent to those listed in paragraph 9.2.2.3.2.2(10) and therefore, ~~in the opinion of the Administration,~~ has little or no fire risk.
- g Ships constructed before 1 July 2014 shall comply, as a minimum, with the previous requirements applicable at the time the ship was constructed, as specified in regulation 1.2.
- h [A bulkhead separating the wheelhouse and the toilet, **when** installed completely within the wheelhouse may have a "C" class fire rating.]
[Where toilets are installed completely within the wheelhouse, the toilet bulkhead within the wheelhouse can be of "C" class integrity.]
- ~~i A navigation locker that can only be accessed from the wheelhouse shall be considered as a control station, and the bulkhead separating the wheelhouse and such a locker shall have fire integrity of at least "B-0" class.]~~
- * Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material, but is not required to be of "A" class standard. However, where a deck, except in a category (10) space, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations should be made tight to prevent the passage of flame and smoke. Divisions between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-fighting system is fitted.

For the application of paragraph 2.2.1.1.2, an asterisk, where appearing in table 9.4, except for categories (8) and (10), shall be read as "A-0".

2.2.5 **Protection of stairways and lifts in accommodation area**

2.2.5.1 Stairways shall be within enclosures formed of "A" class divisions, with positive means of closure at all openings, except that:

- .1 a stairway connecting only two decks need not be enclosed, provided the integrity of the deck is maintained by proper bulkheads or self-closing doors in one 'tween-deck space. When a stairway is closed in one 'tween-deck space, the stairway enclosure shall be protected in accordance with the tables for decks in paragraphs 2.2.3 or 2.2.4; and
- .2 stairways may be fitted in the open in a public space, provided they lie wholly within the public space.

2.2.5.2 Lift trunks shall be so fitted as to prevent the passage of smoke and flame from one 'tween-deck to another and shall be provided with means of closing so as to permit the control of draught and smoke. Machinery for lifts located within stairway enclosures shall be arranged in a separate room, surrounded by steel boundaries, except that small passages for lift cables are permitted. Lifts which open into spaces other than corridors, public spaces, special category spaces, stairways and external areas shall not open into stairways included in the means of escape.

[9.2.2.5.3 Dumb-waiters shall be regarded as lifts.]

2.2.6 **Arrangement of cabin balconies**

On passenger ships constructed on or after 1 July 2008, non-load bearing partial bulkheads which separate adjacent cabin balconies shall be capable of being opened by the crew from each side for the purpose of fighting fires.

2.2.7 **Protection of atriums**

2.2.7.1 Atriums shall be within enclosures formed of "A" class divisions having a fire rating determined in accordance with tables 9.2 and 9.4, as applicable.

2.2.7.2 Decks separating spaces within atriums shall have a fire rating determined in accordance with tables 9.2 and 9.4, as applicable.

2.3 **Cargo ships except tankers**

2.3.1 **Methods of protection in accommodation area**

2.3.1.1 One of the following methods of protection shall be adopted in accommodation and service spaces and control stations:

- .1 Method IC

The construction of internal divisional bulkheads of non-combustible "B" or "C" class divisions generally without the installation of an automatic sprinkler, fire detection and fire alarm system in the accommodation and service spaces, except as required by regulation 7.5.5.1; or

- .2 Method IIC

The fitting of an automatic sprinkler, fire detection and fire alarm system as required by regulation 7.5.5.2 for the detection and extinction of fire in all spaces in which fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheads; or

.3 Method IIIC

The fitting of a fixed fire detection and fire alarm system as required by regulation 7.5.5.3, in spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheads, except that in no case must the area of any accommodation spaces or spaces bounded by an "A" or "B" class division exceed 50 m². ~~Consideration may be given by the Administration to increasing this area for public spaces.~~ However, the area of public spaces may be increased up to 75 m².

2.3.1.2 The requirements for the use of non-combustible materials in the construction and insulation of boundary bulkheads of machinery spaces, control stations, service spaces, etc., and the protection of the above stairway enclosures and corridors will be common to all three methods outlined in paragraph 2.3.1.1.

2.3.2 **Bulkheads within accommodation area**

2.3.2.1 Bulkheads required to be "B" class divisions shall extend from deck to deck and to the shell or other boundaries. However, where a continuous "B" class ceiling or lining is fitted on both sides of the bulkhead, the bulkhead may terminate at the continuous ceiling or lining.

2.3.2.2 Method IC

Bulkheads not required by this or other regulations for cargo ships to be "A" or "B" class divisions, shall be of at least "C" class construction.

2.3.2.3 Method IIC

There shall be no restriction on the construction of bulkheads not required by this or other regulations for cargo ships to be "A" or "B" class divisions except in individual cases where "C" class bulkheads are required in accordance with table 9.5.

2.3.2.4 Method IIIC

There shall be no restriction on the construction of bulkheads not required for cargo ships to be "A" or "B" class divisions except that the area of any accommodation spaces or spaces bounded by a continuous "A" or "B" class division must in no case exceed 50 m², except in individual cases where "C" class bulkheads are required in accordance with table 9.5. ~~Consideration may be given by the Administration to increasing this area for public spaces.~~ However, the area of public spaces may be increased up to 75 m².

2.3.3 **Fire integrity of bulkheads and decks**

2.3.3.1 In addition to complying with the specific provisions for fire integrity of bulkheads and decks of cargo ships, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 9.5 and 9.6.

2.3.3.2 The following requirements shall govern application of the tables:

- .1 Tables 9.5 and 9.6 shall apply respectively to the bulkheads and decks separating adjacent spaces;
- .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (11) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed rooms within a space that have less than 30 % communicating openings to that space are considered separate spaces. The fire integrity of the boundary bulkheads and decks of such smaller rooms shall be as prescribed in tables 9.5 and 9.6. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables;

(1) Control stations

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire control stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.

(2) Corridors

corridors and lobbies.

(3) Accommodation spaces

Spaces as defined in regulation 3.1, excluding corridors.

(4) Stairways

Interior stairway, lifts, totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto. In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries.
Spaces containing electrical distribution boards, having a deck area of 4 m² or less.

(6) Machinery spaces of category A

Spaces as defined in regulation 3.31.

(7) Other machinery spaces

Electrical equipment rooms (auto-telephone exchange, air-conditioning duct spaces).
Spaces as defined in regulation 3.30 excluding machinery spaces of category A.

Spaces separated from the engine-room 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.

(8) *Cargo spaces*

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, saunas, paint lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids, and workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having little or no fire risk. To be considered in this category, enclosed promenades shall have no significant fire risk, meaning that furnishings shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings. Air spaces (the space outside superstructures and deckhouses).

(11) *Ro-ro and vehicle spaces*

Ro-ro spaces as defined in regulation 3.41.
Vehicle spaces as defined in regulation 3.49.

.3 Electrical distribution boards may be located behind panels/linings within accommodation spaces, including stairway enclosures, provided the space is not designed, intended or used for storage of any kind.

Table 9.5 – Fire integrity of bulkheads separating adjacent spaces

Spaces		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control stations	(1)	A-0 ^{e,l}	A-0	A-60 ^k	A-0	A-15	A-60	A-15 ^j	A-60	A-60	*	A-60
Corridors	(2)		C	B-0	B-0 A-0 ^c	B-0	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces	(3)			C ^{a,b}	B-0 A-0 ^c	B-0	A-60	A-0	A-0	A-0	*	A-30
Stairways	(4)				B-0 A-0 ^c	B-0 A-0 ^c	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk)	(5)					C	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A	(6)						*	A-0	A-0 ^g	A-60	*	A-60 ^f
Other machinery spaces	(7)							A-0 ^d	A-0	A-0	*	A-0
Cargo spaces	(8)								*	A-0	*	A-0
Service spaces (high risk)	(9)									A-0 ^d	*	A-30
Open decks	(10)										-	A-0 ^{m,n,q,r}
Ro-ro and vehicle spaces	(11)											A-30 ^{t,i,j,m,p}

Table 9.6 – Fire integrity of decks separating adjacent spaces

Spaces Above Below	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*	A-60
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-30
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*	A-0
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-60 ^{i h}	A-30	A-60	*	A-60
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*	A-0
Cargo spaces	(8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*	A-0
Service spaces (high risk)	(9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0 ^d	*	A-30
Open decks	(10)	*	*	*	*	*	*	*	*	*	-	A-0 ^{ijr}
Ro-ro and vehicle spaces	(11)	A-60	A-30	A-30	A-30	A-0	A-60	A-0	A-0	A-30	A-0 ^{ij}	A-30 ^{ijmop}

Note: To be applied to tables 9.5 and 9.6 as appropriate.

- a No special requirements are imposed upon bulkheads in methods IIC and IIIC fire protection.
- b In case of method IIIC "B" class bulkheads of "B-0" rating shall be provided between spaces or groups of spaces of 50 m² and over in area.
- c For clarification as to which applies, see paragraphs 2.3.2 and 2.3.4.
- d Where spaces are of the same numerical category and superscript d appear, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose (e.g. in category (9)). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- e Bulkheads separating the wheelhouse, chartroom, ~~and~~ radio room ~~and navigation equipment lockers~~ from each other may have a "B-0" rating.
- f An "A-0" rating may be used if no dangerous goods are intended to be carried or if such goods are stowed not less than 3 m horizontally from such a bulkhead.
- g For cargo spaces in which dangerous goods are intended to be carried, regulation 19.3.8 applies.
- ~~h deleted.~~
- i h Fire insulation need not be fitted if the machinery in category (7) is equivalent to those listed in paragraph 9.2.2.3.2.2(10) and therefore, if, in the opinion of the Administration, it has little or no fire risk.
- j i Ships constructed before 1 July 2014 shall comply, as a minimum, with the previous requirements applicable at the time the ship was constructed, as specified in regulation 1.2.
- j Decks and bulkheads to be insulated to "A-30" fire integrity are those boundaries of [single spaces] protected by their own fire-extinguishing system.
- k [A bulkhead separating the wheelhouse and the toilet, [when] installed completely within the wheelhouse may have a "C" class fire rating.]
[Where toilets are installed completely within the wheelhouse, the toilet bulkhead within the wheelhouse can be of "C" class integrity.]

- [l] ~~A navigation locker that can only be accessed from the wheelhouse shall be considered as a control station, and the bulkhead separating the wheelhouse and such a locker shall have fire integrity of at least "B-0" class.]~~
- [m] Class "A" fire integrity respectively does not apply to hatches fitted on open deck adjacent to ro-ro/vehicle spaces and on decks separating ro-ro/vehicle spaces, provided that such hatches are constructed of steel.]
- [n] "A-0" fire integrity does not apply to access doors to ro-ro/vehicle spaces fitted on open decks, provided that such access doors are constructed of steel.]
- [o] Movable ramps installed on decks which form boundaries of "A-30" fire integrity shall be constructed of steel and shall be insulated to "A-30" fire integrity, except for the "working parts" of such movable ramps (e.g. hydraulic cylinders, associated pipes/accessories) and members supporting such fittings which do not contribute to the structural strength of the boundary. Such movable ramps need not be subject to fire test. This is applicable to non-watertight doors for loading/unloading of vehicles.]
- [p] In cargo ships, where ducts for a ro-ro/vehicle spaces pass through other ro-ro/vehicle spaces without serving those spaces, each duct shall be insulated all along itself to "A-30" fire integrity in ways of other ro-ro/vehicle spaces unless the sleeves and fire dampers in compliance with SOLAS regulation II-2/9.7.3.1 in order to prevent spread of fire through the ducts are fitted].
- [q] "A-0" fire integrity does not apply to ventilators constructed of steel fitted on open decks adjacent to ro-ro/vehicle spaces.]
- [r] Between open ro-ro and vehicle spaces, and open decks, the requirement for "A-0" rating should not apply to openings in the ends of the space or where permanent ventilation openings are fitted in the side plating or deckhead in accordance with the definitions in paragraphs 35 and 36 of SOLAS regulation II-2/3, as long as in case of fire in the cargo space such openings do not endanger the areas mentioned in SOLAS regulation II-2/20.3.1.5.]
- * Where an asterisk appears in the tables, the division is required to be of steel or other equivalent material but is not required to be of "A" class standard. However, where a deck, except an open deck, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations should be made tight to prevent the passage of flame and smoke. Divisions between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-fighting system is fitted.

2.3.3.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

2.3.3.4 External boundaries which are required in regulation 11.2 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries of cargo ships to have "A" class integrity. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be constructed of materials which are to the satisfaction of the Administration.

2.3.3.5 Saunas shall comply with paragraph 2.2.3.4, except that space categories mentioned in regulation paragraph 2.2.3.4.1 shall be replaced by (5), (7) and (10).

2.3.4 **Protection of stairways and lift trunks in accommodation spaces, service spaces and control stations**

2.3.4.1 Stairways which penetrate only a single deck shall be protected, at a minimum, at one level by at least "B-0" class divisions and self-closing doors. Lifts which penetrate only a single deck shall be surrounded by "A-0" class divisions with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be surrounded by at least "A-0" class divisions and be protected by self-closing doors at all levels.

2.3.4.1.1 The required protection of stairways penetrating more than a single deck shall be achieved by:

- .1 a stairway enclosure allowing access from one stair to a superimposed stair within such enclosure, the entrances to which shall consist self-closing "A" class fire doors at each deck level (refer to figure in new MSC circular); or
- .2 a stairway enclosure enclosing the stairs only, in combination with self-closing "A" class fire doors at each deck-level and at each end of a stair. No requirements apply to the stairs except that they shall be of steel frame structure or be made of equivalent material (refer to figure in new MSC circular); or
- [.3 stairways that penetrate only one single deck shall be protected, at a minimum, at one level by at least "B-0" class division and self-closing doors.*

* (Refer to the figure in a new MSC circular, proposed to be developed)].

2.3.4.2 On ships having accommodation for 12 persons or less, where stairways penetrate more than a single deck and where there are at least two escape routes direct to the open deck at every accommodation level, the "A-0" requirements of paragraph 2.3.4.1 may be reduced to "B-0".

2.3.4.3 Dumb-waiters shall be regarded as lifts.

2.4 **Tankers**

2.4.1 **Application**

For tankers, only method IC as defined in paragraph 2.3.1.1 shall be used.

2.4.2 **Fire integrity of bulkheads and decks**

2.4.2.1 In lieu of paragraph 2.3 and in addition to complying with the specific provisions for fire integrity of bulkheads and decks of tankers, the minimum fire integrity of bulkheads and decks shall be as prescribed in tables 9.7 and 9.8.

2.4.2.2 The following requirements shall govern application of the tables:

- .1 Tables 9.7 and 9.8 shall apply respectively to the bulkhead and decks separating adjacent spaces;
- .2 For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in categories (1) to (10) below. Where the contents and use of a space are such that there is a doubt as to its classification for the purpose of this regulation, or where it is possible to assign two or more classifications to a space, it shall be treated as a space within the relevant category having the most stringent boundary requirements. Smaller, enclosed areas within a space that have less than 30 % communicating openings to that space are considered separate areas. The fire integrity of the boundary bulkheads and decks of such smaller spaces shall be as prescribed in tables 9.7 and 9.8. The title of each category is intended to be typical rather than restrictive. The number in parentheses preceding each category refers to the applicable column or row in the tables;

(1) Control stations

Spaces containing emergency sources of power and lighting.
Wheelhouse and chartroom.
Spaces containing the ship's radio equipment.
Fire control stations.
Control room for propulsion machinery when located outside the machinery space.
Spaces containing centralized fire alarm equipment.

(2) Corridors

Corridors and lobbies.

(3) Accommodation spaces

Spaces as defined in regulation 3.1, excluding corridors.

(4) Stairways

Interior stairways, lifts, [dumb waiters], totally enclosed emergency escape trunks, and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.
In this connection, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) Service spaces (low risk)

Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m² and drying rooms and laundries.
Spaces containing electrical distribution boards, having a deck area of 4 m² or less.

(6) *Machinery spaces of category A*

Spaces as defined in regulation 3.31.

(7) *Other machinery spaces*

Electrical equipment rooms (auto-telephone exchange and air-conditioning duct spaces). Spaces as defined in regulation 3.30 excluding machinery spaces of category A.

Spaces separated from the engine-room 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.

(8) *Cargo pump-rooms*

Spaces containing cargo pumps and entrances and trunks to such spaces.

(9) *Service spaces (high risk)*

Galleys, pantries containing cooking appliances, saunas, paint, lockers and store-rooms having areas of 4 m² or more, spaces for the storage of flammable liquids and workshops other than those forming part of the machinery spaces.

(10) *Open decks*

Open deck spaces and enclosed promenades having little or no fire risk. To be considered in this category, enclosed promenades shall have no significant fire risk, meaning that furnishings shall be restricted to deck furniture. In addition, such spaces shall be naturally ventilated by permanent openings. Air spaces (the space outside superstructures and deckhouses).

.3 Electrical distribution boards may be located behind panels/linings within accommodation spaces, including stairway enclosures, provided the space is not designed, intended or used for storage of any kind.

2.4.2.3 Continuous "B" class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

2.4.2.4 External boundaries which are required in regulation 11.2 to be of steel or other equivalent material may be pierced for the fitting of windows and sidescuttles provided that there is no requirement for such boundaries of tankers to have "A" class integrity. Similarly, in such boundaries which are not required to have "A" class integrity, doors may be constructed of materials which are to the satisfaction of the Administration.

2.4.2.5 Exterior boundaries of superstructures and deckhouses enclosing accommodation and including any overhanging decks which support such accommodation, shall be constructed of steel and insulated to "A-60" standard for the whole of the portions which face the cargo area and on the outward sides for a distance of 3 m from the end boundary facing the cargo area. The distance of 3 m shall be measured horizontally and parallel to the middle line of the ship from the boundary which faces the cargo area at each deck level. ~~In the case of the sides of those superstructures and deckhouses, such~~ For the portions which face the cargo area, the "A-60" class insulation shall be carried up to the underside of the deck of the navigation bridge.

2.4.2.6 Skylights to cargo pump-rooms shall be of steel, shall not contain any glass and shall be capable of being closed from outside the pump-room.

2.4.2.7 Construction and arrangement of saunas shall comply with paragraph 2.2.3.4, except that space categories mentioned in paragraph 2.2.3.4.1 shall be replaced by (5), (7) and (10).

[2.4.2.8 Stairways and lifts shall comply with paragraph 2.3.4.]

Table 9.7 – Fire integrity of bulkheads separating adjacent spaces

Spaces		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations	(1)	A-0 ^c ^g	A-0	A-60 ^f	A-0	A-15	A-60	A-15 ^g	A-60	A-60	*
Corridors	(2)		C	B-0	B-0 A-0 ^a	B-0	A-60	A-0	A-60	A-0	*
Accommodation spaces	(3)			C	B-0 A-0 ^a	B-0	A-60	A-0	A-60	A-0	*
Stairways	(4)				B-0 A-0 ^a	B-0 A-0 ^a	A-60	A-0	A-60	A-0	*
Service spaces (low risk)	(5)					C	A-60	A-0	A-60	A-0	*
Machinery spaces of category A	(6)						*	A-0	A-0 ^d	A-60	*
Other machinery spaces	(7)							A-0 ^b	A-0	A-0	*
Cargo pump-rooms	(8)								*	A-60	*
Service spaces (high risk)	(9)									A-0 ^b	*
Open decks	(10)										-

Table 9.8 – Fire integrity of decks separating adjacent spaces

Spaces Below	Above	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	-	A-0	*
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	-	A-0	*
Accommodation spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	-	A-0	*
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	-	A-0	*
Service spaces (low risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	-	A-0	*
Machinery spaces of category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-60 ^e	A-0	A-60	*
Other machinery spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*
Cargo pump-rooms	(8)	-	-	-	-	-	A-0 ^d	A-0	*	-	*
Service spaces (high risk)	(9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	-	A-0 ^b	*
Open decks	(10)	*	*	*	*	*	*	*	*	*	-

Notes: To be applied to tables 9.7 and 9.8 as appropriate.

- a For clarification as to which applies, see paragraphs 2.3.2 and 2.3.4.
- b Where spaces are of the same numerical category and superscript b appear, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose (e.g. in category (9)). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.
- c Bulkheads separating the wheelhouse, chartroom, ~~and~~ radio room ~~and navigation equipment lockers~~ from each other may have a "B-0" rating.
- d Bulkheads and decks between cargo pump-rooms and machinery spaces of category A may be penetrated by cargo pump shaft glands and similar gland penetrations, provided that gas tight seals with efficient lubrication or other means of ensuring the permanence of the gas seal are fitted in way of the bulkheads or deck.
- e Fire insulation need not be fitted if the machinery in category (7) is equivalent to those listed in paragraph 9.2.2.3.2.2(10) and therefore ~~if, in the opinion of the Administration, it~~ has little or no fire risk.
- f [A bulkhead separating the wheelhouse and the toilet, ~~when~~ installed completely within the wheelhouse may have a "C" class fire rating.]
[Where toilets are installed completely within the wheelhouse, the toilet bulkhead within the wheelhouse can be of "C" class integrity.]
- ~~g — A navigation locker that can only be accessed from the wheelhouse shall be considered as a control station, and the bulkhead separating the wheelhouse and such a locker shall have fire integrity of at least "B-0" class.]~~
- * Where an asterisk appears in the table, the division is required to be of steel or other equivalent material, but is not required to be of "A" class standard. However, where a deck, except an open deck, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations should be made tight to prevent the passage of flame and smoke. Divisions between control stations (emergency generators) and open decks may have air intake openings without means for closure, unless a fixed gas fire-fighting system is fitted.

3 Penetration in fire-resisting divisions and prevention of heat transmission

3.1 Where "A" class divisions are penetrated, such penetrations shall be tested in accordance with the Fire Test Procedures Code, subject to the provisions of paragraph 4.1.1.67. In the case of ventilation ducts, paragraphs 7.1.2 and 7.3.1 apply. However, where a pipe penetration is made of steel or equivalent material having a thickness of 3 mm or greater and a length of not less than 900 mm (preferably 450 mm on each side of the division), and no openings, testing is not required. Such penetrations shall be suitably insulated by extension of the insulation at the same level of the division.

3.2 Where "B" class divisions are penetrated for the passage of electric cables, pipes, trunks, ducts, etc., or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired, subject to the provisions of paragraph 7.3.2. Pipes other than steel or copper that penetrate "B" class divisions shall be protected by either:

- .1 a fire tested penetration device, suitable for the fire resistance of the division pierced and the type of pipe used; or
- .2 a steel sleeve, having a thickness of not less than 1.8 mm and a length of not less than 900 mm for pipe diameters of 150 mm or more and not less than 600 mm for pipe diameters of less than 150 mm (preferably equally divided to each side of the division). The pipe shall be connected to the ends of the sleeve by flanges or couplings; or the clearance between the sleeve and the pipe shall not exceed 2.5 mm; or any clearance between pipe and sleeve shall be made tight by means of non-combustible or other suitable material.

3.3 Uninsulated metallic pipes penetrating "A" or "B" class divisions shall be of materials having a melting temperature which exceeds 950° for "A-0" and 850°C for "B-0" class divisions.

3.4 In approving structural fire protection details, the Administration shall have regard to the risk of heat transmission at intersections and terminal points of required thermal barriers. The insulation of a deck or bulkhead shall be carried past the penetration, intersection or terminal point for a distance of at least 450 mm in the case of steel and aluminium structures. If a space is divided with a deck or a bulkhead of "A" class standard having insulation of different values, the insulation with the higher value shall continue on the deck or bulkhead with the insulation of the lesser value for a distance of at least 450 mm. ([Refer to figures in new MSC circular]).

3.4.1 Alternative details may be accepted provided that the effectiveness of such design is verified by an appropriate test in the same manner as those specified in the Fire Test P Code.

4 Protection of openings in fire resisting divisions

4.1 Openings in bulkheads and decks in passenger ships

4.1.1 Openings in "A" class divisions

4.1.1.1 Except for hatches between cargo, special category, store, and baggage spaces, and between such spaces and the weather decks, openings shall be provided with permanently attached means of closing which shall be at least as effective for resisting fires as the divisions in which they are fitted. Where required divisions are replaced by divisions of a higher standard, the means of closing need only conform to the required division.

4.1.1.2 The construction of doors and door frames in "A" class divisions, with the means of securing them when closed, shall provide resistance to fire as well as to the passage of smoke and flame equivalent to that of the bulkheads in which the doors are situated, this being determined in accordance with the Fire Test Procedures Code. Such doors and door frames shall be constructed of steel or other equivalent material. Doors approved without the sill being part of the frame, which are installed on or after 1 July 2010, shall be installed such that the gap under the door does not exceed 12 mm. A non-combustible sill shall be installed under the door such that floor coverings do not extend beneath the closed door.

4.1.1.3 Watertight doors constructed in accordance with SOLAS regulation II-1/16 and fitted in fire divisions below the bulkhead deck, where those divisions are also required to be watertight, need not be tested to the Fire Test Procedures Code and need not be insulated, provided that the doors meet the requirements for water tightness in SOLAS regulation II-1/13. However, such doors fitted in fire divisions above the bulkhead deck shall be tested to the Fire Test Procedures Code in accordance with the fire rating of the division they are fitted in.

4.1.1.4 It shall be possible for each door to be opened and closed from each side of the bulkhead by one person only.

4.1.1.5 Fire doors in main vertical zone bulkheads, galley boundaries and stairway enclosures other than power-operated watertight doors and those which are normally locked, shall satisfy the following requirements:

- .1 the doors shall be self-closing and be capable of closing with an angle of inclination of up to 3.5 degrees opposing closure;
- .2 the approximate time of closure for hinged fire doors shall be no more than 40 s and no less than 10 s from the beginning of their movement with the ship in upright position. The approximate uniform rate of closure for sliding doors shall be of no more than 0.2 m/s and no less than 0.1 m/s with the ship in upright position;
- .3 the doors, except those for emergency escape trunks, shall be capable of remote release from the continuously manned central control station, either simultaneously or in groups and shall be capable of release also individually from a position at both sides of the door. Release switches shall have an on-off function to prevent automatic resetting of the system;
- .4 hold-back hooks not subject to central control station release are prohibited;
- .5 a door closed remotely from the central control station shall be capable of being re-opened from both sides of the door by local control. After such local opening, the door shall automatically close again;
- .6 indication must be provided at the fire door indicator panel in the continuously manned central control station whether each door is closed;
- .7 the release mechanism shall be so designed that the door will automatically close in the event of disruption of the control system or central power supply;
- .8 local power accumulators for power-operated doors shall be provided in the immediate vicinity of the doors to enable the doors to be operated after disruption of the control system or central power supply at least 10 times (fully opened and closed) using the local controls;
- .9 disruption of the control system or central power supply at one door shall not impair the safe functioning of the other doors;

- .10 remote-released sliding or power-operated doors shall be equipped with an alarm that sounds at least 5 s but no more than 10 s after the door being released from the central control station and before the door begins to move and continues sounding until the door is completely closed;
- .11 a door designed to re-open upon contacting an object in its path shall re-open not more than 1 m from the point of contact;
- .12 double-leaf doors equipped with a latch necessary for their fire integrity shall have a latch that is automatically activated by the operation of the doors when released by the system;
- .13 doors giving direct access to special category spaces which are power-operated and automatically closed need not be equipped with the alarms and remote-release mechanisms required in paragraphs 4.1.1.5.3 and 4.1.1.5.10;
- .14 the components of the local control system shall be accessible for maintenance and adjusting;
- .15 power-operated doors shall be provided with a control system of an approved type which shall be able to operate in case of fire and be in accordance with the Fire Test Procedures Code. This system shall satisfy the following requirements:
 - .1 the control system shall be able to operate the door at the temperature of at least 200° for at least 60 min, served by the power supply;
 - .2 the power supply for all other doors not subject to fire shall not be impaired; and
 - .3 at temperatures exceeding 200° the control system shall be automatically isolated from the power supply and shall be capable of keeping the door closed up to at least 945°.

[4.1.1.6 Lift door indication signals shall meet the following:

- .1 the signal showing that "A" class lift doors are in the closed position shall be activated only when the order to close the main fire doors has been given by the continuously manned central control station; and
- .2 when there are several lifts giving access to the same stairway, the lift door indicators located in the continuously manned central control station shall be capable of indicating that all the "A" class lift doors giving access to the same landing are properly closed. This indication shall be shown on the panel.]

4.1.1.67 In ships carrying not more than 36 passengers, where a space is protected by an automatic sprinkler fire detection and fire alarm system complying with the provisions the Fire Safety Systems Code or fitted with a continuous "B" class ceiling, openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "A" class integrity requirements insofar as is reasonable and practicable in the opinion of the Administration.

4.1.1.78 The requirements for "A" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles, provided that there is no requirement for such boundaries to have "A" class integrity in paragraph 4.1.3.3. The requirements for "A" class integrity of the outer boundaries of the ship shall not apply to exterior doors, except for those in superstructures and deckhouses facing lifesaving appliances, embarkation and external assembly station areas, external stairs and open decks used for escape routes. Stairway enclosure doors need not meet this requirement.

4.1.1.89 Except for watertight doors, weathertight doors (semi- watertight doors), doors leading to the open deck and doors which need to be reasonably gastight, all "A" class doors located in stairways, public spaces and main vertical zone bulkheads in escape routes shall be equipped with a self-closing hose port of material, construction and fire resistance which is equivalent to the door into which it is fitted, and shall be a 150 mm square clear opening with the door closed and shall be inset into the lower edge of the door, opposite the door hinges or, in the case of sliding doors, nearest the opening.

[4.1.1.910 Where it is necessary that a ventilation duct passes through a main vertical zone division, a fail-safe automatic closing fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The operating position shall be readily accessible and be marked in red light reflecting colour. The duct between the division and the damper shall be of steel or other equivalent material and, if necessary, insulated to comply with the requirements of paragraph 3.1. The damper shall be fitted on at least one side of the division with a visible indicator showing whether the damper is in the open position reference shall be made to paragraph 7.2.6.]

4.1.2 **Openings in "B" class divisions**

4.1.2.1 Doors and door frames in "B" class divisions and means of securing them shall provide a method of closure which shall have resistance to fire equivalent to that of the divisions, this being determined in accordance with the Fire Test Procedure Code except that ventilation openings may be permitted in the lower portion of such doors. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 m². Alternatively, a non-combustible air balance duct routed between the cabin and the corridor, and located below the sanitary unit is permitted where the cross-sectional area of the duct does not exceed 0.05 m². All ventilation openings shall be fitted with a grill made of non-combustible material. Doors shall be non-combustible. Doors approved without the sill being part of the frame, which are installed on or after 1 July 2010, shall be installed such that the gap under the door does not exceed 25 mm.

4.1.2.2 Cabin doors in "B" class divisions shall be of a self-closing type. Hold-back hooks are not permitted.

4.1.2.3 The requirements for "B" class integrity of the outer boundaries of a ship shall not apply to glass partitions, windows and sidescuttles. Similarly, the requirements for "B" class integrity shall not apply to exterior doors in superstructures and deckhouses. For ships carrying not more than 36 passengers, the Administration may permit the use of combustible materials in doors separating cabins from the individual interior sanitary spaces such as showers.

4.1.2.4 In ships carrying not more than 36 passengers, where an automatic sprinkler system complying with the provisions of the Fire Safety Systems Code is fitted:

- .1 openings in decks not forming steps in main vertical zones nor bounding horizontal zones shall be closed reasonably tight and such decks shall meet the "B" class integrity requirements insofar as is reasonable and practicable in the opinion of the Administration; and

- .2 openings in corridor bulkheads of "B" class materials shall be protected in accordance with the provisions of paragraph 2.2.2.

4.1.3 **Windows and sidescuttles**

4.1.3.1 Windows and sidescuttles in bulkheads within accommodation and service spaces and control stations other than those to which the provisions of paragraph 4.1.1.78 and of paragraph 4.1.2.3 apply, shall be so constructed * as to preserve the integrity requirements of the type of bulkheads in which they are fitted, this being determined in accordance with the Fire Test Procedures Code.

[* For reference, construction standards include, but are not limited to, the following:

ISO 614:2012 Shipbuilding and marine structures – Toughened safety glass panes for rectangular windows and side scuttles – Punch method of non-destructive strength testing
ISO 1095:1989 Shipbuilding and marine structures – Toughened safety glass panes for side scuttles
ISO 1751:2012 Shipbuilding and marine structures – Ship's side scuttles
ISO 3254:1989 Shipbuilding and marine structures – Toughened safety glass panes for rectangular windows
ISO 3903:2012 Shipbuilding and marine structures – Ships' ordinary rectangular windows
ISO 3904:1990 Shipbuilding and marine structures – Clear view screens]

4.1.3.2 Notwithstanding the requirements of tables 9.1 to 9.4, windows and sidescuttles in bulkheads separating accommodation and service spaces and control stations from weather shall be constructed with frames of steel or other suitable material. The glass shall be retained by a metal glazing bead or angle.

4.1.3.3 Windows facing life-saving appliances, embarkation and assembly stations, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have fire integrity as required in table 9.1. Where automatic dedicated sprinkler heads are provided for windows, "A-0" windows may be accepted as equivalent. To be considered under this paragraph, the sprinkler heads must either be:

- .1 dedicated heads located above the windows, and installed in addition to the conventional ceiling sprinklers; or
- .2 conventional ceiling sprinkler heads arranged such that the window is protected by an average application rate of at least 5 l/m² and the additional window area is included in the calculation of the area of coverage; or
- .3 water-mist nozzles that have been tested and approved in accordance with the guidelines approved by the Organization*."

* Refer to *Revised Guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12 (resolution A.800(19), as amended).*

Windows located in the ship's side below the lifeboat embarkation area shall have fire integrity at least equal to "A-0" class.

4.1.3.4 Notwithstanding the requirement in paragraph 4.1.3.3, the requirements in paragraphs 4.1.3.5 and 4.1.3.6 shall apply to ships constructed on or after 1 January 2020.

4.1.3.5 For ships carrying more than 36 passengers, windows facing survival craft, embarkation and assembly stations, external stairs and open decks used for escape routes, and windows situated below liferaft and escape slide embarkation areas shall have fire integrity as required in table 9.1. Where automatic dedicated sprinkler heads are provided for windows, "A-0" windows may be accepted as equivalent. To be considered under this paragraph, the sprinkler heads must either be:

- .1 dedicated heads located above the windows, and installed in addition to the conventional ceiling sprinklers; or
- .2 conventional ceiling sprinkler heads arranged such that the window is protected by an average application rate of at least 5 l/min per square metre and the additional window area is included in the calculation of the area of coverage; or
- .3 water-mist nozzles that have been tested and approved in accordance with the Guidelines approved by the Organization *; and

* Refer to the *Revised guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS regulation II-2/12* (resolution A.800(19), as amended).

Windows located in the ship's side below the lifeboat embarkation area shall have fire integrity at least equal to "A-0" class.

4.1.3.6 For ships carrying not more than 36 passengers, windows facing survival craft and escape slide, embarkation areas and windows situated below such areas shall have fire integrity at least equal to "A-0" class.

4.2 **Doors in fire-resisting divisions in cargo ships**

4.2.1 The fire resistance of doors shall be equivalent to that of the division in which they are fitted, this being determined in accordance with the Fire Test Procedures Code. Where required divisions are replaced by divisions of a higher standard, the door need only conform to the required division. Doors and door frames in "A" class divisions shall be constructed of steel or equivalent material. Doors in "B" class divisions shall be non-combustible. Doors fitted in boundary bulkheads of machinery spaces of category A shall be reasonably gastight and self-closing. In ships constructed according to method IC, the Administration may permit the use of combustible materials in doors separating cabins from individual interior sanitary accommodation such as showers. Doors approved as "A" class without the sill being part of the frame, which are installed on or after 1 July 2010, shall be installed such that the gap under the door does not exceed 12 mm and a non-combustible sill shall be installed under the door such that floor coverings do not extend beneath the closed door. Doors approved as "B" class without the sill being part of the frame, which are installed on or after 1 July 2010, shall be installed such that the gap under the door does not exceed 25 mm.

4.2.2 Doors required to be self-closing shall not be fitted with hold-back hooks. However, hold-back arrangements fitted with remote release devices of the fail-safe type may be utilized.

4.2.3 In corridor bulkheads ventilation openings may be permitted in and under the doors of cabins and public spaces. Ventilation openings are also permitted in "B" class doors leading to lavatories, offices, pantries, lockers and store rooms. Except as permitted below, the openings shall be provided only in the lower half of a door. Where such an opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 m². Alternatively, a non-combustible air balance duct routed between the cabin and the corridor, and located below the sanitary unit is permitted where the cross-sectional area of the duct does not exceed 0.05 m². Ventilation openings, except those under the door, shall be fitted with a grille made of non-combustible material.

4.2.4 Watertight doors need not be insulated.

5 Protection of openings in machinery spaces boundaries

5.1 Application

5.1.1 The provision of this paragraph shall apply to machinery spaces of category A and, where the Administration considers it desirable, to other machinery spaces.

5.2 Protection of openings in machinery space boundaries

5.2.1 The number of skylights, doors, ventilators, openings in funnels to permit exhaust ventilation and other openings to machinery spaces shall be reduced to a minimum consistent with the needs of ventilation and the proper and safe working of the ship.

5.2.2 Skylights shall be of steel and shall not contain glass panels.

5.2.3 Means of control shall be provided for closing power-operated doors or actuating release mechanisms on doors other than power-operated watertight doors. The control shall be located outside the space concerned, where they will not be cut off in the event of fire in the space it serves.

5.2.4 In passenger ships, the means of control required in paragraph 5.2.3 shall be situated at one control position or grouped in as few positions as possible to the satisfaction of the Administration. Such positions shall have safe access from the open deck.

5.2.5 In passenger ships, doors, other than power-operated watertight doors shall be so arranged that positive closure is assured in case of fire in the space by power-operated closing arrangements or by the provision of self-closing doors capable of closing against an inclination of 3.5 degrees opposing closure, and having a fail-safe hold-back arrangement, provided with a remotely operated release device. Doors for emergency escape trunks need not be fitted with a fail-safe hold-back facility and a remotely operated release device.

5.2.6 Windows shall not be fitted in machinery space boundaries. However, this does not preclude the use of glass in control rooms within the machinery spaces.

6 Protection of cargo space boundaries

6.1 In passenger ships, indicators shall be provided on the navigating bridge which shall indicate when any fire door leading to or from the special category spaces is closed.

6.2 In tankers, for the protection of cargo tanks carrying crude oil and petroleum products having a flashpoint not exceeding 60°, materials readily rendered ineffective by heat shall not be used for valves, fittings, tank opening covers, cargo vent piping, and cargo piping so as to prevent the spread of fire to the cargo.

7 Ventilation systems

(This paragraph applies to ships constructed on or after 1 January 2016)

7.1 General

7.1.1 Ventilation ducts, including single and double wall ducts, shall be of steel or equivalent material except flexible bellows of short length not exceeding 600 mm used for connecting fans to the ducting in air-conditioning rooms. Unless expressly provided otherwise in paragraph 7.1.6, any other material used in the construction of ducts, including insulation, shall also be non-combustible. However, short ducts, not generally exceeding 2 m in length and with a free cross-sectional area * not exceeding 0.02 m², need not be of steel or equivalent material, subject to the following conditions:

* The term free cross-sectional area means, even in the case of a pre-insulated duct, the area calculated on the basis of the inner dimensions of the duct itself and not the insulation.

- .1 the ducts shall be made of non-combustible material, which may be faced internally and externally with membranes having low flame-spread characteristics and, in each case, a calorific value ** not exceeding 45 MJ/m² of their surface area for the thickness used;

** Refer to the recommendations published by the International Organization for Standardization, in particular publication ISO 1716:2002, *Reaction to the fire tests for building products – Determination of the heat of combustion*.

- .2 the ducts are only used at the end of the ventilation device; and
- .3 the ducts are not situated less than 600 mm, measured along the duct, from an opening in an "A" or "B" class division, including continuous "B" class ceiling.

[7.1.2 (new) A ventilation duct made of material other than steel may be considered equivalent to a ventilation duct made of steel, provided the material is non-combustible and has passed a standard fire test in accordance with annex 1, part 3 of the Fire Test Procedures Code as non-load bearing structure for 30 minutes following the requirements for testing "B" class divisions.]

(Subsequent renumbering would be necessary if this new paragraph is agreed).]

7.1.2 The following arrangements shall be tested in accordance with the Fire Test Procedures Code:

- .1 fire dampers, including their relevant means of operation, however, the testing is not required for dampers located at the lower end of the duct in exhaust ducts for galley ranges, which must be of steel and capable of stopping the draught in the duct; and
- .2 duct penetrations through "A" class divisions. However, the test is not required where steel sleeves are directly joined to ventilation ducts by means of riveted or screwed connections or by welding.

7.1.3 Fire dampers shall be easily accessible. Where they are placed behind ceilings or linings, these ceilings or linings shall be provided with an inspection hatch on which the identification number of the fire damper is marked. The fire damper identification number shall also be marked on any remote controls provided.

7.1.4 Ventilation ducts shall be provided with hatches for inspection and cleaning. The hatches shall be located near the fire dampers.

7.1.5 The main inlets and outlets of ventilation systems shall be capable of being closed from outside the spaces being ventilated. The means of closing shall be easily accessible as well as prominently and permanently marked and shall indicate the operating position of the closing device.

7.1.6 Combustible gaskets in flanged ventilation duct connections are not permitted within 600 mm of openings in "A" or "B" class divisions and in ducts required to be of "A" class construction.

7.1.7 Ventilation openings or air balance ducts between two enclosed spaces shall not be provided except as permitted by paragraphs 4.1.2.1 and 4.2.3.

7.2 Arrangement of ducts

7.2.1 The ventilation systems for machinery spaces of category A, vehicle spaces, ro-ro spaces, galleys, special category spaces and cargo spaces shall, in general, be separated from each other and from the ventilation systems serving other spaces. However, the galley ventilation systems on cargo ships of less than 4,000 gross tonnage and in passenger ships carrying not more than 36 passengers need not be completely separated from other ventilation systems, but may be served by separate ducts from a ventilation unit serving other spaces. In such a case, an automatic fire damper shall be fitted in the galley ventilation duct near the ventilation unit.

7.2.2 Ducts provided for the ventilation of machinery spaces of category A, galleys, vehicle spaces, ro-ro spaces or special category spaces shall not pass through accommodation spaces, service spaces, or control stations unless they comply with paragraph 7.2.4 *.

* [(Refer to figures in a new MSC circular, proposed to be developed)].

7.2.3 Ducts provided for the ventilation of accommodation spaces, service spaces or control stations shall not pass through machinery spaces of category A, galleys, vehicle spaces, ro-ro spaces or special category spaces unless they comply with paragraph 7.2.4 *.

* [(Refer to figures in a new MSC circular, proposed to be developed)].

7.2.4 As permitted by paragraphs 7.2.2 and 7.2.3 ducts shall be either:

- 1.1 constructed of steel having a thickness of at least 3 mm for ducts with a free cross-sectional area of less than 0.075 m², at least 4 mm for ducts with a free cross-sectional area of between 0.075 m² and 0.45 m², and at least 5 mm for ducts with a free cross-sectional area of over 0.45 m²;
- 1.2 suitably supported and stiffened;
- 1.3 fitted with automatic fire dampers close to the boundaries penetrated; and
- 1.4 insulated to "A-60" class standard from the boundaries of the spaces they serve to a point at least 5 m beyond each fire damper;

or

- 2.1 constructed of steel in accordance with paragraphs 7.2.4.1.1 and 7.2.4.1.2;
- and
- 2.2 insulated to "A-60" class standard throughout the spaces they pass through, except for ducts that pass through spaces of category (9) or (10) as defined in paragraph 2.2.3.2.2.

7.2.5 For the purposes of paragraphs 7.2.4.1.4 and 7.2.4.2.2, ducts shall be insulated over their entire cross-sectional external surface. Ducts that are outside but adjacent to the specified space, and share one or more surfaces with it, shall be considered to pass through the specified space, and shall be insulated over the surface they share with the space for a distance of 450 mm past the duct *.

* ~~Sketches of such arrangements are contained in the *Unified Interpretations of SOLAS chapter II-2* (MSC.1/Circ.1276). [(Refer to figures in a new MSC circular, proposed to be developed)].~~

7.2.6 Where it is necessary that a ventilation duct passes through a main vertical zone division, a **[fail safe]** automatic **[closing]** fire damper shall be fitted adjacent to the division. The damper shall also be capable of being manually closed from each side of the division. The control location shall be readily accessible and be clearly and prominently marked. The duct between the division and the damper shall be constructed of steel in accordance with paragraphs 7.2.4.1.1 and 7.2.4.1.2 and insulated to at least the same fire integrity as the division penetrated. The damper shall be fitted on at least one side of the division with a visible indicator showing the operating position of the damper.

7.3 Details of fire dampers and duct penetrations

7.3.1 Ducts passing through "A" class divisions shall meet the following requirements:

- .1 where a thin plated duct with a free cross sectional area equal to, or less than, 0.02 m² passes through "A" class divisions, the opening shall be fitted with a steel sheet sleeve having a thickness of at least 3 mm and a length of at least 200 mm, divided preferably into 100 mm on each side of a bulkhead or, in the case of a deck, wholly laid on the lower side of the decks penetrated;
- .2 where ventilation ducts with a free cross-sectional area exceeding 0.02 m², but not more than 0.075 m², pass through "A" class divisions, the openings shall be lined with steel sheet sleeves. The ducts and sleeves shall have a thickness of at least 3 mm and a length of at least 900 mm. When passing through bulkheads, this length shall be divided preferably into 450 mm on each side of the bulkhead. These ducts, or sleeves lining such ducts, shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the division through which the duct passes; shall be provided only to the part of the duct and/or sleeve that is on the same side of the division being fire insulated, and be extended for a minimum of 450 mm along the duct and/or sleeve; and
- .3 automatic fire dampers shall be fitted in all ducts with a free cross-sectional area exceeding 0.075 m² that pass through "A" class divisions. Each damper shall be fitted close to the division penetrated and the duct between the damper and the division penetrated shall be constructed of steel in accordance with paragraphs 7.2.4.1.1 and 7.2.4.1.2. This section of the duct shall be provided with fire insulation that has at least the same fire integrity as the division that the duct is penetrating. The fire damper shall operate automatically, but shall also be capable of being closed manually from both sides of the division. The damper shall be fitted with a visible indicator which shows the operating position of the damper. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" class divisions, without serving those spaces, provided those ducts have the same fire integrity as the divisions which they penetrate. A duct of cross-sectional area exceeding 0.075 m² shall not be divided into smaller ducts at the penetration of an "A" class division and then recombined into the original duct once through the division to avoid installing the damper required by this provision.

7.3.2 Ventilation ducts with a free cross-sectional area exceeding 0.02 m² passing through "B" class bulkheads shall be lined with steel sheet sleeves of 900 mm in length, divided preferably into 450 mm on each side of the bulkheads unless the duct is of steel for this length.

7.3.2.1 When a duct passing through a division is to be in accordance with paragraphs 9.3.2 and 9.7.3.2, any [space]/[gap] between the duct and the division shall be sealed.

7.3.3 All fire dampers shall be capable of manual operation. The dampers shall have a direct mechanical means of release or, alternatively, be closed by electrical, hydraulic, or pneumatic operation. All dampers shall be manually operable from both sides of the division. Automatic fire dampers, including those capable of remote operation, shall have a failsafe mechanism that will close the damper in a fire even upon loss of electrical power or hydraulic or pneumatic pressure loss. Remotely operated fire dampers shall be capable of being reopened manually at the damper.

7.4 Ventilation systems for passenger ships carrying more than 36 passengers

7.4.1 In addition to the requirements in sections 7.1, 7.2 and 7.3, the ventilation system of a passenger ship carrying more than 36 passengers shall also meet the following requirements.

7.4.2 In general, the ventilation fans shall be so arranged that the ducts reaching the various spaces remain within a main vertical zone.

7.4.3 Stairway enclosures shall be served by an independent ventilation fan and duct system (exhaust and supply) which shall not serve any other spaces in the ventilation systems.

7.4.4 A duct, irrespective of its cross-section, serving more than one 'tween-deck accommodation space, service space or control station, shall be fitted, near the penetration of each deck of such spaces, with an automatic smoke damper or fire damper that shall also be capable of being closed manually from the protected deck above the damper. Where a fan serves more than one 'tween-deck space through separate ducts within a main vertical zone, each dedicated to a single 'tween-deck space, each duct shall be provided with a manually operated smoke damper fitted close to the fan.

7.4.5 Vertical ducts shall, if necessary, be insulated as required by tables 9.1 and 9.2. Ducts shall be insulated as required for decks between the space they serve and the space being considered, as applicable.

7.5 Exhaust ducts from galley ranges

7.5.1 Requirements for passenger ships carrying more than 36 passengers

7.5.1.1 In addition to the requirements in sections 7.1, 7.2 and 7.3, exhaust ducts from galley ranges shall be constructed in accordance with paragraphs 7.2.4.2.1 and 7.2.4.2.2 and insulated to "A-60" class standard throughout accommodation spaces, service spaces, or control stations they pass through. They shall also be fitted with:

- .1 a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;
- .2 a fire damper located in the lower end of the duct at the junction between the duct and the galley range hood which is automatically and remotely operated and, in addition, a remotely operated fire damper located in the upper end of the duct close to the outlet of the duct;

- .3 a fixed means for extinguishing a fire within the duct *;

* Refer to the recommendations published by the International Organization for Standardization, in particular publication ISO 15371:20092015, *Ships and marine technology – Fire-extinguishing systems for protection of galley cooking equipment* or other suitable standards 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.

- .4 remote-control arrangements for shutting off the exhaust fans and supply fans, for operating the fire dampers mentioned in paragraph 7.5.1.1.2 and for operating the fire-extinguishing system, which shall be placed in a position outside the galley close to the entrance to the galley. Where a multi-branch system is installed, a remote means located with the above controls shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system; and
- .5 suitably located hatches for inspection and cleaning, including one provided close to the exhaust fan and one fitted in the lower end where grease accumulates.

7.5.1.2 Exhaust ducts from ranges for cooking equipment installed on open decks shall conform to paragraph 7.5.1.1, as applicable, when passing through accommodation spaces or spaces containing combustible materials.

7.5.2 **Requirements for cargo ships and passenger ships carrying not more than 36 passengers**

When passing through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed in accordance with paragraphs 7.2.4.1.1 and 7.2.4.1.2. Each exhaust duct shall be fitted with:

- .1 a grease trap readily removable for cleaning;
- .2 an automatically and remotely operated fire damper located in the lower end of the duct at the junction between the duct and the galley range hood and, in addition, a remotely operated fire damper in the upper end of the duct close to the outlet of the duct;
- .3 arrangements, operable from within the galley, for shutting off the exhaust and supply fans; and
- .4 fixed means for extinguishing a fire within the duct. *

* Refer to the recommendations published by the International Organization for Standardization, in particular publication ISO 15371:20092015, *Ships and marine technology – Fire-extinguishing systems for protection of galley cooking equipment* or other suitable standards 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.

7.6 Ventilation rooms serving machinery spaces of category A containing internal combustion machinery

7.6.1 Where a ventilation room serves only such an adjacent machinery space and there is no fire division between the ventilation room and the machinery space:

- .1 the fan room may be considered as part of the machinery space;
- .2 in case a boundary between fan room and machinery space, the requirements for the fire integrity need not apply;
- .3 the means for closing the ventilation duct or ducts serving the machinery space shall be located outside of the ventilation room and machinery space.

7.6.2 Where a ventilation room serves such a machinery space as well as other spaces and is separated from the machinery space by a "A-0" class division, including penetrations:

- .1 ducts serving the machinery space shall be routed directly to the relevant fan(s) and from the fan to the louvers;
- .2 the means for closing the ventilation duct or ducts for the machinery space can be located in the ventilation room.

7.7 Ventilation systems for laundries in passenger ships carrying more than 36 passengers

Exhaust ducts from laundries and drying rooms of category (13) spaces as defined in paragraph 2.2.3.2.2 shall be fitted with:

- .1 filters readily removable for cleaning purposes;
- .2 a fire damper located in the lower end of the duct which is automatically and remotely operated;
- .3 remote-control arrangements for shutting off the exhaust fans and supply fans from within the space and for operating the fire damper mentioned in paragraph 7.7.2; and
- .4 suitably located hatches for inspection and cleaning.
