

SUB-COMMITTEE ON SHIP SYSTEMS AND  
EQUIPMENT  
10th session  
Agenda item 17

SSE 10/17/1  
15 November 2023  
Original: ENGLISH  
Pre-session public release:

## BIENNIAL STATUS REPORT AND PROVISIONAL AGENDA FOR SSE 11

### Proposal to include the output "Review and update SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements" in the provisional agenda for SSE 11

Submitted by IACS

#### SUMMARY

<i>Executive summary:</i>	This document proposes to include the output "Review and update SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements" in the provisional agenda for SSE 11.
<i>Strategic direction, if applicable:</i>	7
<i>Output:</i>	Not applicable
<i>Action to be taken:</i>	Paragraph 17
<i>Related documents:</i>	MSC 104/15/2; MSC 105/20; SSE 7/16/1, SSE 7/16/4 and SSE 9/14/2

#### Introduction

1 The Maritime Safety Committee, at its 105th session, agreed to include in its post-biennial agenda an output on "Review and update SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements", with two sessions needed to complete the item, assigning the SSE Sub-Committee as the associated organ (MSC 105/20, paragraph 18.9).

2 The Committee also agreed that:

- .1 the amendments to be developed should apply to new ships to which SOLAS chapter II-2 applied;
- .2 the output was to amend SOLAS regulation II-2/9 to incorporate existing guidance and clarify requirements in SOLAS regulations II-2/9.7.3.1.3 and II-2/9.2.3.3 and tables 9.5 and 9.6, to remove any ambiguities; and

- .3 the amendments to be developed should enter into force on 1 January 2028, provided that they were adopted before 1 July 2026.

3 Further, SSE 9 considered document SSE 9/14/2 (IACS), proposing a draft interpretation of SOLAS regulation II-2/9.7.4.5, focusing on the fire insulation requirements for vertical ducts which pass through both a bulkhead and a deck, without serving the spaces they pass through. Having noted some concerns on the complexity of the draft unified interpretation which might lead to misinterpretation, SSE 9 agreed to consider the proposal under the above-mentioned output, when appropriate (SSE 9/20, paragraph 14.40).

## **Discussion**

4 The current SOLAS regulation II-2/9 was adopted in 2000. Since its adoption, several IMO guidance documents pertaining to this regulation have been approved as MSC circulars. The incorporation of those guidance documents into SOLAS is considered to provide clarity by reducing the number of relevant documents and provide a single source of applicable requirements.

5 In addition to incorporating existing IMO guidance in SOLAS regulation II-2/9, the scope of the output also includes a clarification of the requirements in SOLAS regulations II-2/9.7.3.1.3 and II-2/9.2.3.3 and tables 9.5 and 9.6, based on the following documents:

- .1 SSE 7/16/1 (IACS), proposing a unified interpretation of SOLAS regulation II-2/9.7.3.1.3 on fire insulation on the sleeve of ventilation ducts. SSE 7 agreed that this would require an amendment to SOLAS (SSE 7/21, paragraph 16.11); and
- .2 SSE 7/16/4 (IACS), seeking clarification of the extent of the application of the requirements in tables 9.5 and 9.6 of SOLAS regulation II-2/9.2.3.3 regarding the structural fire integrity of bulkheads and decks between open ro-ro and vehicle decks, and open decks. SSE 7 agreed that this would require an amendment to SOLAS (SSE 7/21, paragraph 16.13).

## ***Draft amendments to SOLAS regulation II-2/9 to incorporate existing guidance***

6 IACS has reviewed the MSC circulars in table 1 of document MSC 104/15/2 (United Kingdom et al.) and developed draft amendments to SOLAS regulation II-2/9 to incorporate the IMO guidance text, in addition to consequential draft amendments to the definitions in SOLAS regulation II-2/3.

7 In addition to the MSC circulars listed in table 1 of document MSC 104/15/2, the following new MSC circulars have been considered:

- .1 MSC.1/Circ.1655, containing a unified interpretation of SOLAS regulations II-2/9.7.3.1.1, 9.7.3.1.2 and II-2/9.7.3.2 related to fire insulation of ventilation ducts sleeves based on document SSE 7/16/1 (IACS); and
- .2 MSC.1/Circ.1634, containing the unified interpretation of SOLAS regulation II-2/9.2.2.3.2.2(9) related to pantry spaces based on document SSE 7/16/2 (United States).

8 A list of proposed amendments to SOLAS regulations II-2/9 and II-2/3, and the associated existing guidance is provided in annex 1.

9 The draft amendments to SOLAS regulation II-2/9 and II-2/3 are provided in annex 2. The draft amendments should be read in conjunction with the list of draft amendments in annex 1.

10 It should be noted that many of the existing MSC circulars (for example MSC/Circ.1120, MSC.1/Circ.1276 and MSC.1/Circ.1510) contain explanatory figures which are considered useful to visualize the intent of the interpretations. The Sub-Committee may consider compiling these explanatory figures in a new guidance document, for example an MSC circular, when the guidance text is lifted into SOLAS. IACS will be ready to provide that draft MSC circular to SSE 11, should the Sub-Committee agree to discuss this agenda item at the next session. Examples of such explanatory figures are provided in annex 3.

### ***Fire insulation of ventilation duct sleeves (SOLAS regulation II-2/9.7.3.1.3)***

11 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).

12 Accordingly, IACS has developed draft amendments to SOLAS regulation II-2/9.7.3.1.3 to 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.

### ***Fire integrity of open ro-ro spaces on cargo ships (tables 9.5 and 9.6 of SOLAS regulation II-2/9.2.3.3)***

13 Document SSE 7/16/4 presented three different understandings of the application of the requirements regarding insulation of "A-0" class standard of bulkheads and decks separating adjacent spaces on an open ro-ro deck and an open deck. SSE 7 concluded that "understanding 2" was agreeable, as it was consistent with the relevant SOLAS regulation (SSE 7/21, paragraph 16.6.2).

14 Accordingly, IACS developed a draft new "note" to tables 9.5 and 9.6 of SOLAS regulation II-2/9.2.3 to clarify that the requirement of "A-0" class standard insulation 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.

### ***Application dates***

15 Noting that section 4.1.2 of *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments* (MSC.1/Circ.1500/Rev.2) states that past application dates, in general, should be kept for the amendments adopted between comprehensive revisions of SOLAS, no past application dates in SOLAS regulation II-2/9 have been proposed to be amended.

### **Proposal**

16 Based on the discussion in paragraphs 4 to 15, IACS proposes to include the output on "Review and update SOLAS regulation II-2/9 on containment of fire to incorporate existing guidance and clarify requirements" on the provisional agenda of SSE 11.

**Action requested of the Sub-Committee**

17 The Sub-Committee is invited to consider the above, the proposal in paragraph 16 and take action, as appropriate.

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**ANNEX 1\***

**LIST OF DRAFT AMENDMENTS TO INCORPORATE EXISTING GUIDANCE**

**SOLAS REGULATION II-2/3**

<b>SOLAS II-2/3</b>	<b>Topic</b>	<b>IMO reference document</b>	<b>Action</b>
3.1	Definition of "Accommodation spaces".	MSC/Circ.1120, as amended by MSC.1/Circ.1436	<i>Added the guidance under 3.1 "Devices in pantries or isolated pantries containing no cooking appliances".</i>
3.45	Definition of "Service spaces".		<i>Added the guidance under 3.45 "Devices in main pantries and pantries containing cooking appliances and galleys".</i>

**SOLAS REGULATION II-2/9**

<b>SOLAS II-2/9</b>	<b>Topic</b>	<b>IMO reference document</b>	<b>Action</b>
9.2.2.1.3 bis (new)	Main vertical zones.	MSC/Circ.1120	<i>Added text from MSC/Circ.1120. The figures from MSC/Circ.1120 is proposed moved to a new circular containing explanatory figures to SOLAS regulation II-2/9.</i>
9.2.2.2.2.1	Continuous "B" class ceiling.	MSC/Circ.1120	<i>Added text from MSC/Circ.1120 on construction of extended bulkhead behind continuous ceilings or linings.</i>
9.2.2.2.3	"B" class bulkheads within a main vertical zone.	MSC/Circ.1120	<i>Added a footnote with the reference to MSC/Circ.917.</i>
9.2.2.3.2.2(7)	Diet kitchens	MSC/Circ.1120	<i>The text of MSC/Circ.1120 is added to the regulation. The text "containing no cooking appliances" is added for clarity.</i>
9.2.2.3.2.2(7)	Electrical distribution boards on passenger ships carrying more than 36 passengers.	MSC/Circ.1120	<i>The text of MSC/Circ.1120 is added to amend the regulation as follows:</i> <ol style="list-style-type: none"> <li><i>1. the second sentence of the interpretation is added under category (7);</i></li> <li><i>2. the first sentence of the interpretation that clarify the permitted location of electrical distribution boards is provided as new regulation II-2/9.2.2.3.2.6.</i></li> </ol>

\* The annex is provided in the English language only.

SOLAS II-2/9	Topic	IMO reference document	Action
9.2.2.3.2.2(9)	Pantries.	MSC.1/Circ.1634	<p><i>The regulation is amended with the addition of the text from MSC.1/Circ.1634.</i></p> <p><i>The drawing of pantries arrangement is proposed included in a new MSC circular containing explanatory figures to SOLAS regulation II-2/9..</i></p>
9.2.2.3.2.2(10)	Fire integrity of the division between engine rooms and spaces, in which urea or sodium hydroxide solution tanks are installed.	MSC.1/Circ.1616	<p><i>The text of the regulation is amended with the addition of text from MSC/Circ.1616.</i></p>
9.2.2.3.2.6 (new)	Location of electrical distribution boards	MSC/Circ.1120	<p><i>See 9.2.2.3.2.2(7) above.</i></p>
9.2.2.4.2.2(5)	Electrical distribution boards on passenger ships carrying no more than 36 passengers.	MSC/Circ.1120	<p><i>The text of MSC/Circ.1120 is added to amend the regulation as follows:</i></p> <ol style="list-style-type: none"> <li><i>1. the second sentence of the interpretation is added under category (5);</i></li> <li><i>2. the first sentence of the interpretation to clarify the permitted location of electrical distribution boards is provided as new regulation II-2/9.2.2.4.2.5.</i></li> </ol>
9.2.2.4.2.2(7)	Fire integrity of the division between engine rooms and spaces, in which urea or sodium hydroxide solution tanks are installed, on board of passenger ships carrying no more than 36 passengers.	MSC.1/Circ.1616	<p><i>The text of the regulation is amended with the addition of text from MSC.1/Circ.1616.</i></p>
9.2.2.4.2.5 (new)	Location of electrical distribution boards	MSC/Circ.1120	<p><i>See 9.2.2.4.2.2(5) above.</i></p>
9.2.2.4.5	Arrangement of saunas on board of passenger ships carrying no more than 36 passengers.	MSC/Circ.1120	<p><i>The text of MSC/Circ.1120 is added to the existing regulation to clarify the arrangement of spaces adjacent to saunas.</i></p>

SOLAS II-2/9	Topic	IMO reference document	Action
9.2.3.1.1.3 and 9.2.3.2.4	Permitted increased area up to 75 m <sup>2</sup> for public spaces on cargo ships constructed in accordance with method III C.	MSC/Circ.1120	<i>The interpretation of MSC/Circ. 1120 is incorporated into regulation 9.2.3.1.1.3 and 9.2.3.2.4.</i>
9.2.3.3.2.2(5) and 9.2.4.2.2.2(5)	Electrical distribution boards on cargo ships and tankers.	MSC/Circ.1120	<i>The text of MSC/Circ. 1120 is added to amend the regulation as follows:</i>  <i>1. the second sentence of the interpretation is added under category (5);</i> <i>2. the first sentence of the interpretation to clarify the permitted location of electrical distribution boards is provided as new regulation II-2/9.2.3.3.2.3 and II-2/9.2.4.2.2.3.</i>
9.2.3.3.2.2(7) and 9.2.4.2.2.2(7)	Fire integrity of the division between engine rooms and spaces, in which urea or sodium hydroxide solution tanks are installed, on board of cargo ships and tankers.	MSC.1/Circ.1616	<i>The text of the regulation is amended with the addition of text from MSC. 1/Circ. 1616 to include these spaces under category (7).</i>
9.2.3.3.2.3 (new)	Location of electrical distribution boards	MSC/Circ.1120	<i>See 9.2.3.3.2.2(5) above.</i>
9.2.3.3.5 and 9.2.4.2.7	Arrangement of saunas on board of cargo ships and tankers.	MSC/Circ.1120	<i>The text of MSC/Circ. 1120 is added to the existing regulation to clarify the arrangement of spaces adjacent to saunas.</i>
9.2.3.4.1bis (new)	Construction of protected stairways on cargo ships.	MSC/Circ.1120	<i>The text of MSC/Circ. 1120 with the criteria for the construction and protection of stairways in cargo ships is added in a new regulation.</i>  <i>The drawings clarifying the construction of protected stairways are proposed included in a new MSC circular containing explanatory figures to SOLAS regulation II-2/9.</i>
9.2.3.4.2bis (new)	Dumb waiters.	MSC/Circ.1120	<i>The text of MSC/Circ. 1120 on equivalence between dumb-waiters and lifts on board of cargo ships is added as new regulation, not to regulation 9.2.3.4.1.</i>
9.2.4.2.2.3 (new)	Location of electrical distribution boards	MSC/Circ.1120	<i>See 9.2.4.2.2.2(5) above.</i>

<b>SOLAS II-2/9</b>	<b>Topic</b>	<b>IMO reference document</b>	<b>Action</b>
9.2.4.2.5	Exterior boundaries of superstructures and deckhouses on tankers.	MSC.1/Circ.1203	<i>The text of MSC/Circ.1203 on extension of "A-60" insulation to the portions of exterior boundaries facing the cargo area of tankers is added to the regulation.</i>
9.3.1	Penetrations in fire-resisting divisions and prevention of heat transmission.	MSC/Circ.1120	<i>In accordance with MSC/Circ.1120, reference to IMO resolution A.753(18) on plastic pipes as amended by resolution MSC.313(88) and Resolution MSC.399(95), is added as a footnote.</i>
9.3.1	Penetrations in fire-resisting divisions and prevention of heat transmission.	MSC.1/Circ.1203	<i>The text of MSC.1/Circ.1203 for penetrations fitted on exterior boundaries of tankers is added to the regulation.</i>
9.3.4	Heat transmission at intersections.	MSC/Circ.1120 MSC.1/Circ.1510	<i>The text of MSC/Circ.1120 is added to the regulation. The drawing in the interpretation on heat transmission at intersections and terminal points, is proposed included in a new MCS circular containing explanatory figures to SOLAS II-2/9.</i>
9.4.1.1.1 and 9.4.2.1	Fire doors.	MSC/Circ.1120	<i>The clarification on fire doors installed on divisions of higher standard is added to the regulation (interpretation of 9.4.1.1.2).</i>
9.4.1.1.3	Fire testing of watertight doors.	MSC/Circ.1037 MSC/Circ.1120	<i>The text of regulation is amended in accordance with the following papers:</i> <ol style="list-style-type: none"> <li>1. <i>MSC/Circ.1037: clarification on watertight doors that do not need to be fire tested and positioning of the text within the SOLAS Regulation deemed more appropriate (9.4.1.1.3, instead than 9.4.1.1.2);</i></li> <li>2. <i>MSC/Circ.1120; interpretation of regulation 9.4.1.1.2</i></li> </ol>
9.4.1.1.5 bis (new)	Lift doors arrangement.	MSC/Circ.1120	<i>The provisions of MSC/Circ.1120 on indication and signals for fire doors on lifts, are added as a new paragraph.</i>
9.4.1.1.10	Ventilation ducts passing through a main vertical zone.	-	<i>Text is replaced with reference to regulation II-2/9.7.2.6 on ventilation ducts passing through MVZ's</i>
9.4.1.3.1	Windows and side scuttles	MSC/Circ.1120	<i>The latest revision in force of the ISO Standards listed as examples in MSC/Circ.1120 for the construction and testing of windows are added as footnotes.</i>



<b>SOLAS II-2/9</b>	<b>Topic</b>	<b>IMO reference document</b>	<b>Action</b>
9.4.2.1	Doors and door frames construction.	MSC/Circ.1120	<i>The text of MSC/Circ.1120 about the use of "steel equivalent" material in fire doors frame construction, is added to the regulation.</i>
9.7.1.1	Non-combustible material as "steel or equivalent" for ventilation ducts.	MSC.1/Circ.1527	<i>The text of MSC/Circ.1527 on the application of "steel equivalent" material in the construction of ventilation ducts is added to the regulation.</i>
9.7.2.2, 9.7.2.3 and 9.7.2.5	Arrangement of ducts	MSC.1/Circ.1276	<i>Figures provided in MSC.1/Circ.1276 are proposed included in a new MCS circular containing explanatory figures to SOLAS II-2/9.</i>
9.7.2.6	Type of means of closing of fire dampers	MSC/Circ.1120	<i>The text of MSC/Circ.1120 added to the regulation and text is aligned with regulation 9.4.1.1.10.</i>
9.7.3.1.2	Ducts passing through "A" class divisions	MSC.1/Circ.1655	<i>The text on positioning of fire insulation overlap on the steel sleeve is added into the regulation 9.7.3.1.2.</i>
9.7.3.1.3	Fire insulation of duct sleeves	SSE 7/16/1	<i>Text to clarify fire insulation of the duct between the division and the damper.</i>
9.7.3.1.3	Fire dampers in ventilation ducts.	MSC/Circ.1120	<i>The text of MSC/Circ.1120 on manual closing achievement for fire dampers (9.4.1.1.8, 9.7.3.1.2), is added to the regulation.</i>
9.7.3.2bis (new)	Details of fire dampers and duct penetrations	MSC.1/Circ.1655	<i>The text on arrangement of penetrations in "B" class division that forbids any clearance between the duct and the pierced division is added as new paragraph 7.3.2 bis.</i>
9.7.4.4	Ventilation system penetrating decks.	MSC/Circ.1120	<i>The text of MSC/Circ.1120 on means of closing for ducts serving more than one 'tween-deck accommodation space, service space or control station, is added to the regulation.</i>
9.7.5.1.1.3 and 9.7.5.2.4	Means for extinguishing fires within exhaust ducts.	MSC.1/Circ.1616	<i>The clarifications on fire extinguishing systems for exhaust ducts of galley ranges given in MSC.1/Circ.1616, are added as footnote to the regulation.</i>
9.7.5.2.4	Means for extinguishing fires within exhaust ducts.	MSC.1/Circ.1616	<i>The clarifications on fire extinguishing systems for exhaust ducts of galley ranges given in MSC.1/Circ.1616 are added as footnote to the regulation.</i>
9.7.6.1 and 9.7.6.2	Ventilation rooms	MSC.1/Circ.1239	<i>The criteria for categorization and construction of fan rooms serving engine room provided by MSC.1/Circ.1239 are added to the regulation.</i>

**SOLAS REGULATION II-2/9, TABLES 9.1 TO 9.8**

<b>Table of SOLAS II-2/9</b>	<b>Topic</b>	<b>IMO reference document</b>	<b>Action</b>
Table 9.1	Fire rating of bulkhead between the wheelhouse and toilet inside wheelhouse	MSC.1/Circ.1555	Added as footnote "e" at the following intersection points: <ul style="list-style-type: none"> <li>• (1)/(1), and</li> <li>• (1)/(9).</li> </ul>
Table 9.3			Added as footnote "h" at the following intersection points: <ul style="list-style-type: none"> <li>• (1)/(1), and</li> <li>• (1)/(3).</li> </ul>
Table 9.5			Added as footnote "k" at the intersection point (1)/(3).
Table 9.7			Added as footnote "f" at the intersection point (1)/(1).
Table 9.3	Fire rating of bulkhead between the wheelhouse and the navigation locker	MSC.1/Circ.1581	Added as footnote "i" at the following intersection points: <ul style="list-style-type: none"> <li>• (1)/(1), and</li> <li>• (1)/(7).</li> </ul>
Table 9.5			Added as footnote "l" at the following intersection points: <ul style="list-style-type: none"> <li>• (1)/(3), and</li> <li>• (1)/(7).</li> </ul>
Table 9.7			Added as footnote "g" at the following intersection points: <ul style="list-style-type: none"> <li>• (1)/(1), and</li> <li>• (1)/(7).</li> </ul>
Tables 9.5 and 9.6	Fire integrity of the boundaries of ro-ro/vehicle spaces	MSC.1/Circ.1511 SSE 7/16/4	The text of the interpretations is added to the tables' footnotes as follows: <ul style="list-style-type: none"> <li>• footnote "j": decks and bulkheads,</li> <li>• footnote "m": hatches,</li> <li>• footnote "n": access doors,</li> <li>• footnote "o": movable ramps,</li> <li>• footnote "p": ventilation ducts,</li> <li>• footnote "q": ventilators.</li> <li>• footnote "r": decks and bulkheads</li> </ul>

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## ANNEX 2

### AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974\*

#### CHAPTER II-2

#### CONSTRUCTION – FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

##### Regulation 3 - Definitions

1 Regulation 3.1 is replaced by the following:

"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; and

.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."

2 Regulation 3.45 is replaced by the following:

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

45.1 Main pantries and 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.

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\* The annex is provided in the English language only. Tracked changes are indicated using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

45.2 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."

## **Regulation 9 – Containment of fire**

3 Regulation 9 is replaced by the following:

### **"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 m<sup>2</sup> 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 is to be measured from the far side of the main vertical zone stairway enclosure. In this case, all boundaries of the stairway enclosure are to be insulated as main vertical zone bulkheads and access doors leading into the stairway are to be provided from the zone. However, the stairway is not to 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 in so far 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 of B-0, then the extension shall be made of thin steel plates of 1 mm thickness and tightened (e.g. with mineral wool). Alternatively, B-0 class extensions is to be constructed of a suitably supported mineral wool (density at least 100 kg/m<sup>3</sup>, thickness at least 50 mm); 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 m<sup>2</sup>.

**(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 m<sup>2</sup> or more.

Isolated lockers and small store-rooms in accommodation spaces having areas less than 4 m<sup>2</sup> (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 m<sup>2</sup> or less).

Specie rooms.

Operating rooms.

Identifiable space containing electrical distribution boards and having a deck area of 4 m<sup>2</sup> 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 m<sup>2</sup> 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.

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 not annexed to galleys.  
Main laundry.  
Large drying rooms (having a deck area of more than 4 m<sup>2</sup>)  
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 m<sup>2</sup>, 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.
- .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 Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage.

**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 <sup>a</sup> e	A-0	A-0	A-0	A-0	A-60	A-60	A-60	A-0 <sup>d</sup>	A-0	A-60	A-60	A-60	A-60
Stairways (2)		A-0 <sup>a</sup>	A-0	A-0	A-0	A-0	A-0	A-15	A-0	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 <sub>b,d</sub>	A-60 <sub>b,d</sub>	A-60 <sub>b,d</sub>	A-0 <sup>d</sup>	A-0	A-60 <sub>b</sub>	A-60 <sub>b</sub>	A-60 <sub>b</sub>	A-60 <sub>b</sub>
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 <sup>a</sup>	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 <sup>a</sup>	A-0	A-0	A-15
Machinery spaces and main galleys (12)												A-0 <sup>a</sup>	A-0	A-60
Store-rooms, workshops, pantries, etc. (13)													A-0 <sup>a</sup>	A-0
Other spaces in which flammable liquids are stored (14)														A-30

See notes following table 9.2.

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

Space below ↓ Spaces above →	(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 <sup>a</sup>	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-0	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-0	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 <sup>a</sup>	A-0	A-60
Store-rooms, work-shops, 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.

- <sup>a</sup> 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).
- <sup>b</sup> 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".
- <sup>c</sup> Where public toilets are installed completely within the stairway enclosure, the public toilet bulkhead within the stairway enclosure can be of "B" class integrity.
- <sup>d</sup> 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.
- <sup>e</sup> A bulkhead separating the wheelhouse and the toilet, installed completely within the wheelhouse, requires no fire rating.

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 shall 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 propulsion 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) 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.
- (5) Service spaces (low risk)**  
Lockers and store-rooms not having provisions for the storage of flammable liquids and having areas less than 4 m<sup>2</sup> and drying rooms and laundries.  
Identifiable space containing electrical distribution boards and having a deck area of 4 m<sup>2</sup> 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 m<sup>2</sup> 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 spaces and ro-ro space**

Spaces as defined in regulations 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.
- .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 Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage.

**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 <sup>c,ii</sup>	A-0	A-60 <sup>ii</sup>	A-0	A-15	A-60	A-15 <sup>i</sup>	A-60	A-60	*	A-60
Corridors (2)		C <sup>e</sup>	B-0 <sup>e</sup>	A-0 <sup>a</sup> B-0 <sup>e</sup>	B-0 <sup>e</sup>	A-60	A-0	A-0	A-15 A-0 <sup>d</sup>	*	A-30 <sup>g</sup>
Accommodation spaces (3)			C <sup>e</sup>	A-0 <sup>a</sup> B-0 <sup>e</sup>	B-0 <sup>e</sup>	A-60	A-0	A-0	A-15 A-0 <sup>d</sup>	*	A-30 A-0 <sup>d</sup>
Stairways (4)				A-0 <sup>a</sup> B-0 <sup>e</sup>	A-0 <sup>a</sup> B-0 <sup>e</sup>	A-60	A-0	A-0	A-15 A-0 <sup>d</sup>	*	A-30 <sup>g</sup>
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	A-60	*	A-60
Other machinery spaces (7)							A-0	A-0	A-0	*	A-0
Cargo spaces (8)								*	A-0	*	A-0
Service spaces (high risk) (9)									A-0 <sup>b</sup>	*	A-30
Open decks (10)											A-0
Special category and ro-ro spaces (11)											A-30 <sup>g</sup>

See notes following table 9.4.

**Table 9.4 – Fire integrity of decks separating adjacent spaces**

Space below ↓ Spaces 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 <sup>g</sup>
Corridors (2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 <sup>g</sup>
Accommodation spaces (3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*	A-30 A-0 <sup>d</sup>
Stairways (4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*	A-30 <sup>g</sup>
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 <sup>f</sup>	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 <sup>d</sup>	A-30 A-0 <sup>d</sup>	A-30 A-0 <sup>d</sup>	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 <sup>g</sup>	A-30 A-0 <sup>d</sup>	A-30 <sup>g</sup>	A-0	A-60 <sup>g</sup>	A-0	A-0	A-30	A-0	A-30 <sup>g</sup>

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

<sup>a</sup> For clarification as to which applies, see paragraphs 2.2.2 and 2.2.5.

<sup>b</sup> 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.

<sup>c</sup> Bulkheads separating the wheelhouse and chartroom from each other may have a "B-0" rating. No fire rating is required for those partition separating the navigation bridge and the safety centre when the latter is within the navigation bridge.

<sup>d</sup> See paragraph 2.2.4.2.3 and 2.2.4.2.4.

<sup>e</sup> 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".

<sup>f</sup> 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.

<sup>g</sup> 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.

<sup>h</sup> A bulkhead separating the wheelhouse and the toilet, installed completely within the wheelhouse, requires no fire rating.

<sup>i</sup> 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 category (10) space, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations shall be made tight to prevent the passage of flame and smoke. Division between control stations (emergency generators) and open decks may have air intake openings without means of closure, unless a fixed gas fire-extinguishing 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".



2.2.4.3 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).

## **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.

## **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 space or spaces bounded by an "A" or "B" class division exceed ~~50~~ 75 m<sup>2</sup>. However, consideration may be given by the Administration to increasing this area for public spaces.

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 space or spaces bounded by a continuous "A" or "B" class division must in no case exceed ~~50~~ 75 m<sup>2</sup>, 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.

### **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 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 m<sup>2</sup> and drying rooms and laundries.  
Identifiable space containing electrical distribution boards and having a deck area of 4 m<sup>2</sup> 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 m<sup>2</sup> 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 furnishing 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 regulations 3.41.  
Vehicle spaces as defined in regulation 3.49.
- .3 Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage.

**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 <sup>e,l</sup>	A-0	A-60 <sup>k</sup>	A-0	A-15	A-60	A-15 <sup>i</sup>	A-60	A-60	*	A-60
Corridors	(2)	C	B-0	A-0 <sup>c</sup> B-0	B-0	A-60	A-0	A-0	A-0	*	A-30
Accommodation spaces	(3)		C <sup>a,b</sup>	A-0 <sup>c</sup> B-0	B-0	A-60	A-0	A-0	A-0	*	A-30
Stairways	(4)			A-0 <sup>c</sup> B-0	A-0 <sup>c</sup> B-0	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 <sup>g</sup>	A-60	*	A-60 <sup>f</sup>
Other machinery spaces	(7)						A-0 <sup>d</sup>	A-0	A-0	*	A-0
Cargo spaces	(8)							*	A-0	*	A-0
Service spaces (high risk)	(9)								A-0 <sup>d</sup>	*	A-30
Open decks	(10)										A-0 <sup>m,n,q,r</sup>
Ro-ro and vehicle spaces	(11)										A-30 <sup>h,j,m,p</sup>

See notes following table 9.6.

**Table 9.6 – Fire integrity of decks separating adjacent spaces**

Space below ↓ Spaces 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
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 <sup>h</sup>	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 <sup>d</sup>	*	A-30
Open decks (10)	*	*	*	*	*	*	*	*	*	-	A-0 <sup>h,i</sup>
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 <sup>h</sup>	A-30 <sup>h,i,m,o,p</sup>

Notes: 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 m<sup>2</sup> 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" 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.

e Bulkheads separating the wheelhouse, chartroom and radio room 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.~~

<sup>h</sup> 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.

<sup>i</sup> 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.

<sup>j</sup> Decks and bulkheads to be insulated to "A-30" fire integrity are those boundaries of single spaces protected by their own fire-extinguishing system.

<sup>k</sup> A bulkhead separating the wheelhouse and the toilet, installed completely within the wheelhouse, requires no fire rating.

<sup>l</sup> 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.

<sup>m</sup> 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.

<sup>n</sup> "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.

<sup>o</sup> 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 used for loading/unloading of vehicles.

<sup>p</sup> 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.

<sup>q</sup> "A-0" fire integrity does not apply to ventilators constructed of steel fitted on open decks adjacent to ro-ro/vehicle spaces.

<sup>r</sup> 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.

<sup>\*</sup> 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 category (10) space, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations shall be made tight to prevent the passage of flame and smoke. Division between control stations (emergency generators) and open decks may have air intake openings without means of closure, unless a fixed gas fire-extinguishing 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".

2.3.4.2.1 Dumb-waiters are to 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 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 (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 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 9.7 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, 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 m<sup>2</sup> and drying rooms and laundries.

Identifiable space containing electrical distribution boards and having a deck area of 4 m<sup>2</sup> 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 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 m<sup>2</sup> 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 furnishing 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** Distribution boards may be located behind panels/linings within accommodation spaces including stairway enclosures, without the need to categorize the space, provided no provision is made for storage.

**Table 9.7 – Fire integrity of bulkheads separating adjacent spaces**

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

See notes following table 9.8.

**Table 9.8 – Fire integrity of decks separating adjacent spaces**

Space below ↓ Spaces 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 <sup>e</sup>	A-30	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 <sup>d</sup>	A-0	*	-	*
Service spaces (high risk) (9)	A-60	A-0	A-0	A-0	A-0	A-60	A-0	-	A-0 <sup>b</sup>	*
Open decks (10)	*	*	*	*	*	*	*	*	*	-

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

<sup>a</sup> For clarifications as to which applies, see paragraphs 2.3.2 and 2.3.4..

<sup>b</sup> 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..

<sup>c</sup> Bulkheads separating the wheelhouse, chartroom and radio room from each other may have a "B-0" rating.

<sup>d</sup> 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 gastight seals with efficient lubrication or other means of ensuring the permanence of the gas seal are fitted in way of the bulkheads or deck.

<sup>e</sup> 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.

<sup>f</sup> A bulkhead separating the wheelhouse and the toilet, installed completely within the wheelhouse, requires no fire rating.

<sup>g</sup> 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 an open deck, is penetrated for the passage of electric cables, pipes and vent ducts, such penetrations shall 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 of closure, unless a fixed gas fire-extinguishing system is fitted.

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).

### **3 Penetrations 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 4.1.1.6. 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 there are no openings, testing is not required. Such penetrations shall be suitably insulated by extension of the insulation at the same level of the division. Where "A" or "B" class divisions are penetrated for the passage of plastic pipes, arrangements shall be made to ensure that the fire resistance is not impaired, based on the Guidelines developed by the Organization \*. On tankers, this regulation shall be applied to all penetrations at the exterior boundaries of superstructures and deckhouses which, according to SOLAS regulation II-2/9.2.4.2.5, are required to be "A-60" class insulated.

\* Refer to the *Guidelines for the application of plastic pipes on ships* (resolution A.753(18)), as amended.

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 °C 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. 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 FTP Code. 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).

#### **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 door 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 Such doors and door frames shall be constructed of steel or other equivalent material. Watertight doors constructed in accordance with SOLAS regulation II-1/15 and fitted below the bulkhead deck that are required to be watertight need not be tested to the Fire Test Procedures Code provided that the doors meet the

requirements for water tightness in SOLAS regulation II-1/18, and need not be insulated. However, such doors fitted above the bulkhead deck shall be tested to the FTP 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° opposing closure;
- .2 the approximate time of closure for hinged fire doors shall be no more than 40s and no less than 10s 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 shall 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 at least 10 times (fully opened and closed) after disruption of the control system or central power supply 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 is 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°C 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°C, 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°C.

4.1.1.5.1 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 lift doors giving access to the same landing are properly closed. This indication shall be shown on the panel.

4.1.1.6 In ships carrying not more than 36 passengers, where a space is protected by an automatic sprinkler fire detection and 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 in so far as is reasonable and practicable in the opinion of the Administration.

4.1.1.7 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 life-saving appliances, embarkation and external assembly station areas, external stairs and open decks used for escape routes. Stairway enclosure doors need not meet this requirement.



4.1.1.8 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. The material, construction and fire resistance of the hose port shall be 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.

4.1.1.9 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 m<sup>2</sup>. 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 m<sup>2</sup>. 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 in so far 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 4.1.1.7~~8~~ 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 FTP Code.

\* Refer to the following ISO standards:

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/m<sup>2</sup> 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. \*

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\* 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/m<sup>2</sup> 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

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\* 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.

4.1.3.6 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 0.05m<sup>2</sup>.

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 0.05m<sup>2</sup>. Ventilation openings, except those under the door, shall be fitted with a grille made of non-combustible material.

## **5 Protection of openings in machinery space 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° 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 carrying more than 36 passengers, the boundary bulkheads and decks of special category and ro-ro spaces shall be insulated to "A-60" class standard. However, where a category (5), (9) and (10) space, as defined in paragraph 2.2.3, is on one side of the division, the standard may be reduced to "A-0". Where fuel oil tanks are below a special category space, the integrity of the deck between such spaces may be reduced to "A-0" standard.

6.2 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.

6.3 In tankers, for the protection of cargo tanks carrying crude oil and petroleum products having a flashpoint not exceeding 60 °C, 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. 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 FTP Code as non-load bearing structure for 30 minutes following the requirements for testing "B" class divisions. However, short ducts, not generally exceeding 2 m in length and with a free cross-sectional area\* not exceeding 0.02 m<sup>2</sup>, need not be of steel or equivalent material, subject to the following conditions:

- .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/m<sup>2</sup> of their surface area for the thickness used;
- .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.

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\* 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.

\*\* 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.

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 m<sup>2</sup>, at least 4 mm for ducts with a free cross-sectional area of between 0.075 m<sup>2</sup> and 0.45 m<sup>2</sup>, and at least 5 mm for ducts with a free cross-sectional area of over 0.45 m<sup>2</sup>;
- .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.\*

\* (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, an automatic 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 achieved by mechanical means of release or by remote operation of the fire damper by means of a fail-safe electrical switch or pneumatic release (spring-loaded, etc.) on both sides 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,  $0.02 \text{ m}^2$  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  $0.02 \text{ m}^2$ , but not more than  $0.075 \text{ m}^2$ , 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  $0.075 \text{ m}^2$  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. Manual closing shall be achieved by mechanical means of release or by remote operation of the fire damper by means of a fail-safe electrical switch or pneumatic release (spring-loaded, etc.) on 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  $0.075 \text{ m}^2$  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  $0.02 \text{ m}^2$  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, no clearance shall be allowed between the duct and the division.

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 a fire or smoke damper that shall close automatically by means of a fusible link or other suitable device and manually from the deck in which the passage of smoke, due to a fire in the deck immediately below which is served by the same duct, will be avoided. 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 15371:2009/2015, Ships and marine technology – Fire-extinguishing systems for protection of galley cooking equipment or other suitable standard for pre-engineered galley duct fixed fire-extinguishing systems.

CO<sub>2</sub> 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 15371:2009/2015, Ships and marine technology – Fire-extinguishing systems for protection of galley cooking equipment or other suitable standard for pre-engineered galley duct fixed fire-extinguishing systems.

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

## **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.

"

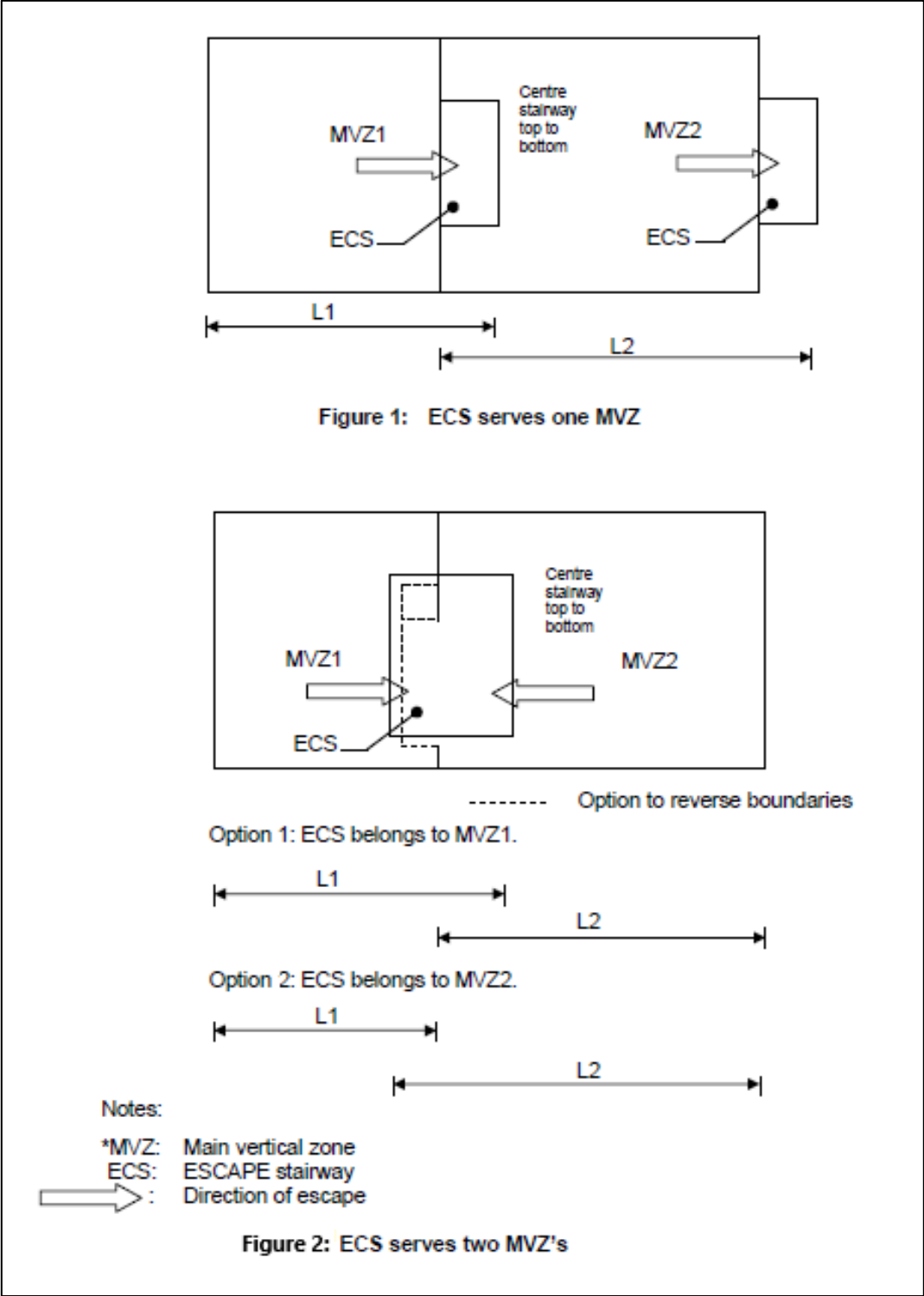
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ANNEX 3\*

EXPLANATORY FIGURES IN EXISTING GUIDANCE DOCUMENTS (examples)

Regulation 9.2.2.1.4: Arrangement of Main vertical zones



\* The annex is provided in the English language only.

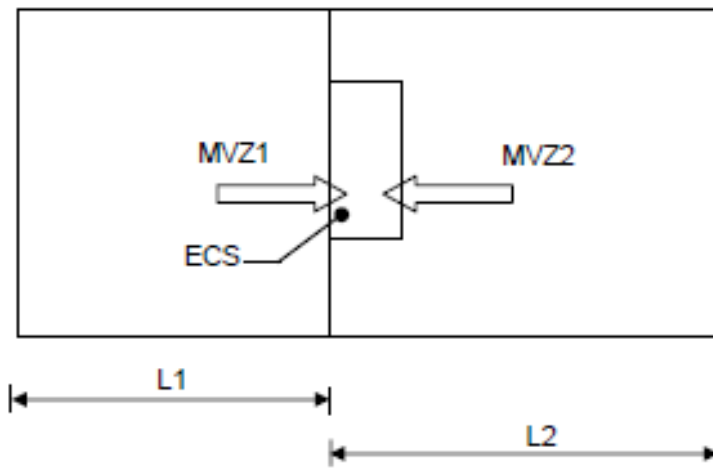


Figure 3: ECS serves two MVZ's (ECS belongs to MVZ2)

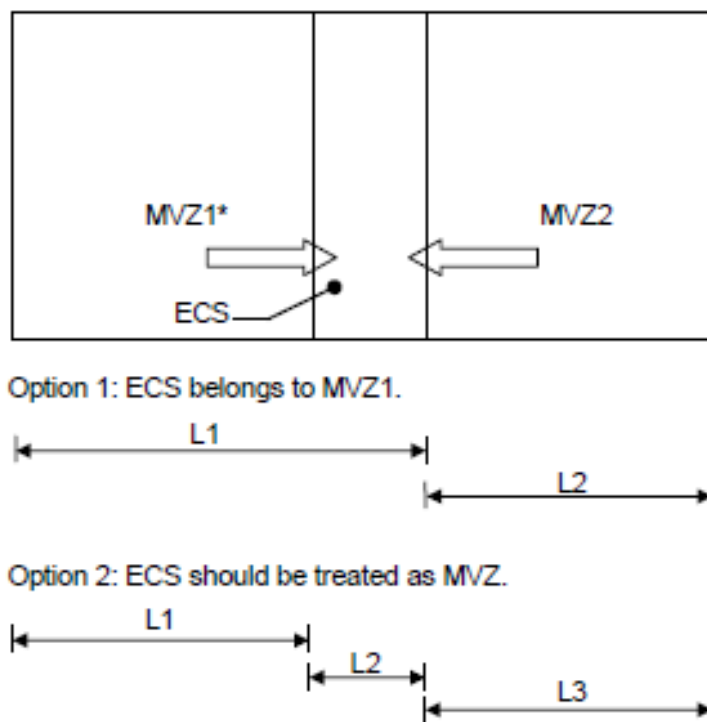
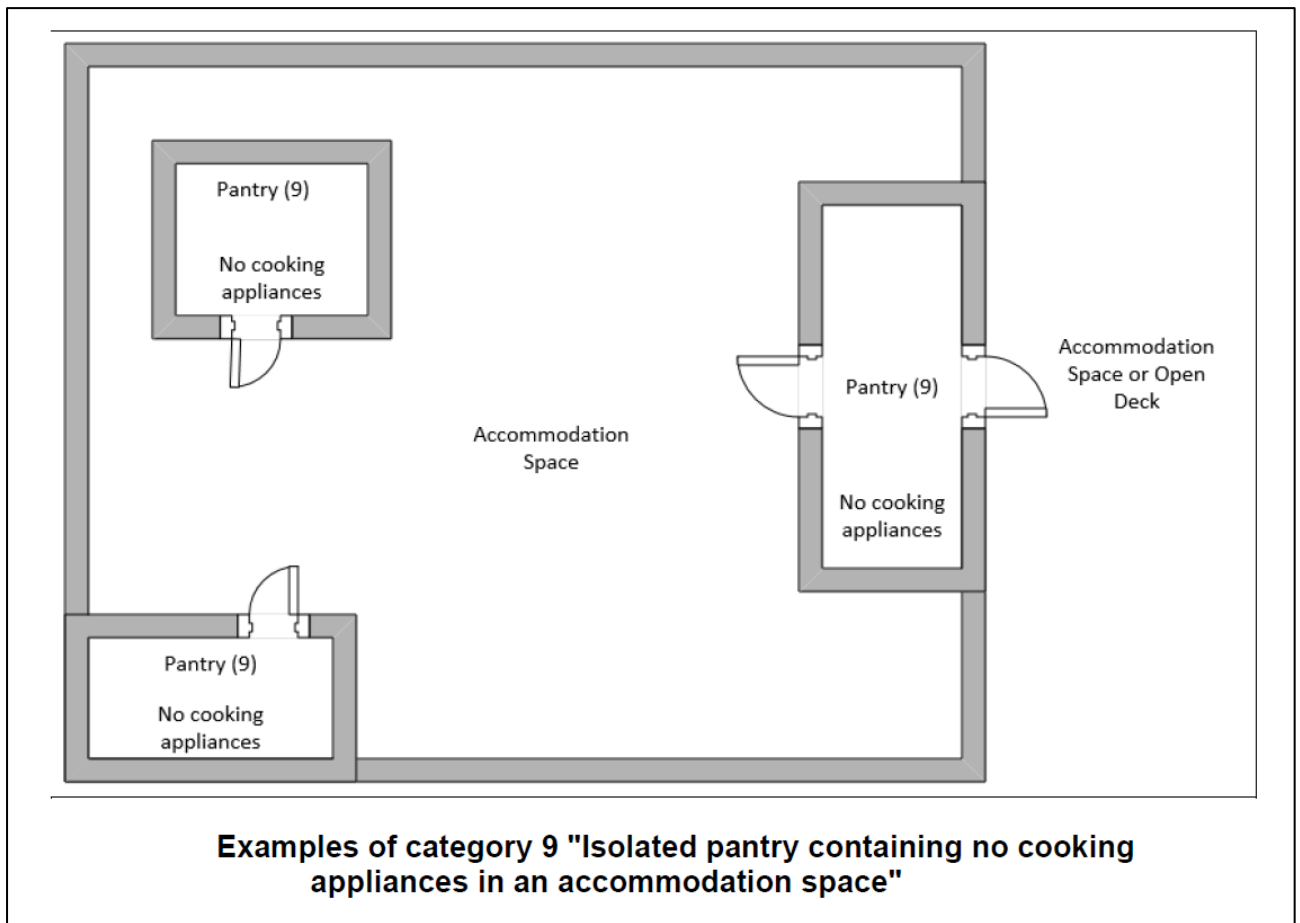
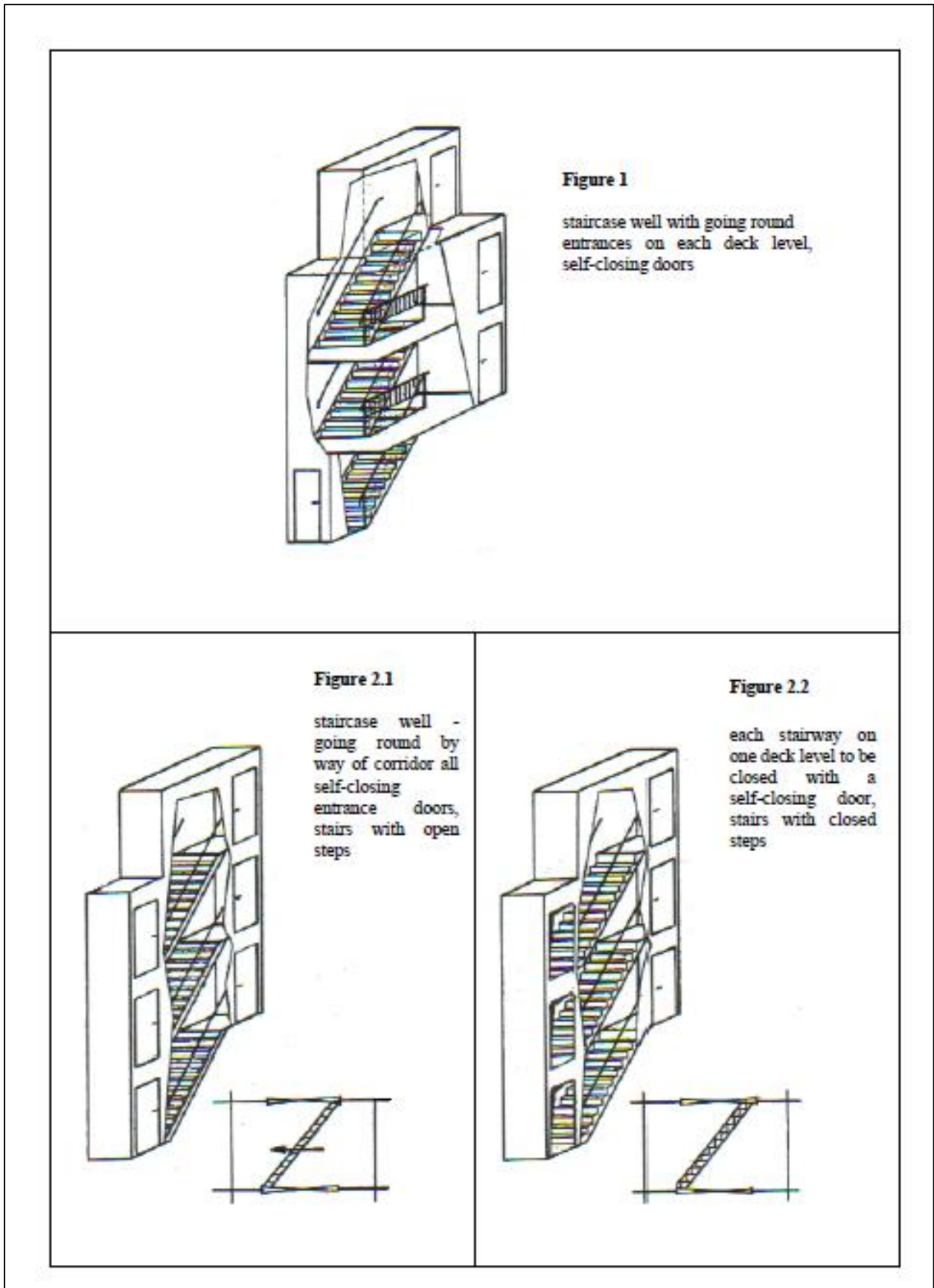


Figure 4: ECS serves two MVZ's

**Regulation 9.2.2.3.2(9): Isolated pantries containing no cooking appliances**

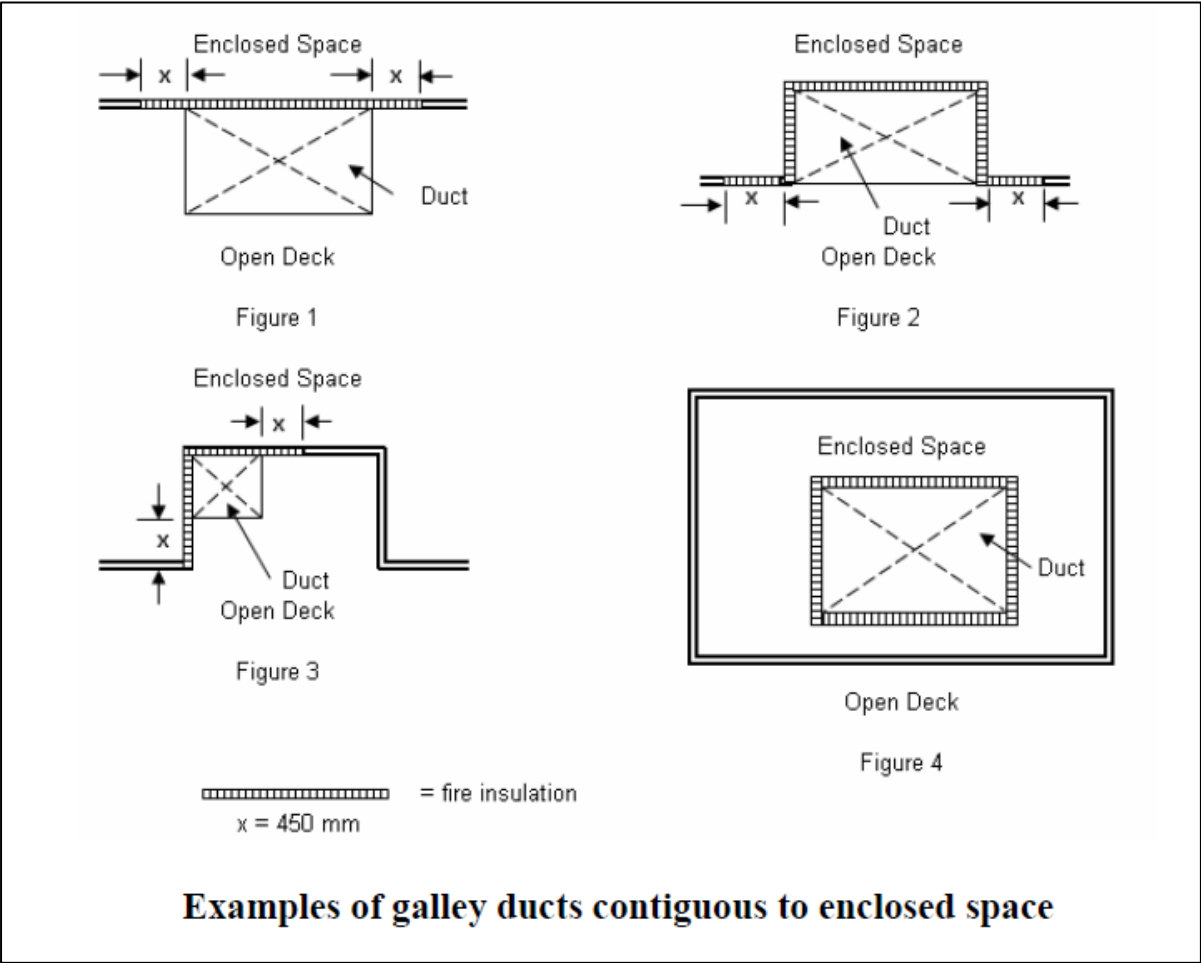


**Regulation 9.2.3.4.1: Construction of protected stairways of cargo ships**





Regulation 9.7.2.2, 9.7.2.3 and 9.7.2.5: Arrangement of ducts



**Regulation 9.3.4: Heat transmission at intersections**

