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FIRE INTEGRITY OF BULKHEADS AND DECKS OF RO-RO SPACES ON PASSENGER AND CARGO SHIPS

**Proposal for amendments to the requirements of fire integrity for boundary bulkheads and
decks of ro-ro spaces of passenger ships carrying no more than 36 passengers
and cargo ships**

Submitted by China

SUMMARY

<i>Executive summary:</i>	This document provides the proposed amendments to the requirements of fire integrity for boundary bulkheads and decks of ro-ro spaces of passenger ships carrying no more than 36 passengers and cargo ships.
<i>Strategic direction:</i>	2 and 5
<i>High-level action:</i>	2.1.1, 5.2.1
<i>Planned output:</i>	5.2.1.1
<i>Action to be taken:</i>	Paragraph 13
<i>Related documents:</i>	1974 SOLAS Convention, as amended; MSC 85/23/3, MSC 85/26; FP 51/9/8, FP 51/19; FP 52/12/6, FP 52/3 and FP 52/21

INTRODUCTION

1 This document is submitted in accordance with the Guidelines on the organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies (MSC-MEPC.1/Circ.2).

BACKGROUND

2 Following its consideration of document MSC 85/23/3 (China), which proposed to amend SOLAS chapter II-2 requirements on fire integrity for boundary bulkheads and decks of ro-ro spaces of passenger ships carrying no more than 36 passengers and cargo ships, MSC 85 agreed to include, in the work programme of the FP Sub-Committee, a high-priority item on “Fire integrity of bulkheads and decks of ro-ro spaces on passenger ships and cargo ships”.

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3 This document provides the proposed revisions to the standards of fire integrity for boundary bulkheads and decks of ro-ro spaces of passenger ships carrying no more than 36 passengers and cargo ships based on the analysis of the ability of fire containment of the boundaries separating ro-ro spaces and adjacent spaces of ro-ro ships as required by the fire safety objectives and functional requirements of SOLAS chapter II-2 and the analysis of the fire spread in the fire accidents which have occurred in ro-ro spaces over the past years.

SCOPE OF THE PROPOSED REVISIONS

Proposed revisions to the fire integrity of bulkheads and decks of ro-ro spaces and vehicle spaces of cargo ships

4 Investigations indicate that solid combustibles carried by the vehicles and vehicles themselves have become the primary fire source. Tests and calculations show that a fire that occurs on a ro-ro cargo deck with a typical length of 180 m can grow to almost 80 MW before it reaches the ventilation control, and the average gas temperature can be as high as between 250°C and 300°C. Consequently, the temperature and heat radiation above the fire can be extremely high (refer to SP 2006:02 of Swedish National Testing and Research Institute). This means that there is an apparent risk for fire to spread through heat conduction to decks above.

5 The investigation report of the fire accident which occurred on the ro-ro cargo ship **Und Adriyatik** shows that the fire spread to several decks within 10 minutes to 15 minutes, due to the absence of fire integrity value of boundaries of ro-ro spaces. This further confirms the prediction of the SP test report that the boundaries between ro-ro spaces and adjacent spaces should be thermal structural divisions.

6 Considering that the fixed fire-extinguishing system fitted for protection of ro-ro spaces is capable of fire suppression and control in normal conditions, and that the evacuation time needed by crew members of cargo ships is much less than for passenger ships carrying more than 36 passengers, it is proposed that the fire integrity of bulkheads and decks between ro-ro spaces or vehicle spaces of cargo ships as prescribed in the present tables 9.5 and 9.6 of SOLAS chapter II-2 should be increased from the present “*h” to “A-30” class.

7 In addition, it is considered that the fire integrity of bulkheads and decks between ro-ro spaces or vehicle spaces and other adjacent spaces of cargo ships, as prescribed in the present tables 9.5 and 9.6 of SOLAS chapter II-2, is reasonable and practicable and should be retained as it is.

8 The revised fire integrity of bulkheads and decks between ro-ro spaces or vehicle spaces and adjacent spaces of cargo ships, as proposed, is shown in tables 9.5 and 9.6 below (the fire integrity value with brackets are the revised ones, and the values in shadow are proposed to be deleted):

Table 9.5 – Fire integrity of bulkheads separating adjacent spaces of cargo ships (shown only with the values between ro-ro spaces or vehicle spaces and adjacent spaces)

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control Stations (1)											“A-60”
Corridors (2)											“A-30”
Accommodation Spaces (3)											“A-30”
Stairways (4)											“A-30”
Service spaces (low risk) (5)											“A-0”
Machinery spaces of category A (6)											“A-60”
Other machinery (7) spaces											“A-0”
Cargo spaces (8)											“A-0”
Service spaces (high risk) (9)											“A-30”
Open deck (10)											“A-0”
Ro-ro and vehicle spaces (11)											“(A-30)” * h

Table 9.6 – Fire integrity of decks separating adjacent spaces of cargo ships (shown only with the values between ro-ro spaces or vehicle spaces and adjacent spaces)

Space above → Space ↓ below	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control Stations (1)											“A-60”
Corridors (2)											“A-30”
Accommodation Spaces (3)											“A-30”
Stairways (4)											“A-30”
Service spaces (low risk) (5)											“A-0”
Machinery spaces of category A (6)											“A-60”
Other machinery spaces (7)											“A-0”

Cargo Spaces (8)											"A-0"
Service spaces (high risk) (9)											"A-30"
Open deck (10)											"(A-0)" *
Special category and ro-ro spaces (11)	"A-60"	"A-30"	"A-30"	"A-30"	"A-0"	"A-60"	"A-0"	"A-0"	"A-30"	"(A-0)" *	"(A-30)" * h

Proposed revisions to the fire integrity of bulkheads and decks of special category spaces and ro-ro spaces of passenger ships carrying no more than 36 passengers

9 Both special spaces or ro-ro cargo spaces of ro-ro passenger ships should also be classified as spaces with high-fire risk since the consequences of fire spread in these spaces could have a similar catastrophic impact on the ship (the dimension and lay-out of storage are the same). The fire integrity standards and the categorization should, therefore, be the same for special spaces and ro-ro cargo spaces.

10 Comparing tables 9.3 and 9.4 (the fire integrity of bulkheads and decks separating adjacent spaces of passenger ships carrying no more than 36 passengers) with tables 9.5 and 9.6 (the fire integrity of bulkheads and decks separating adjacent spaces of cargo ships) respectively, it is found that categorization based on fire risk for both spaces is the same. It is, therefore, proposed that the fire integrity of bulkheads and decks between ro-ro spaces or special category spaces of passenger ships carrying no more than 36 persons, as prescribed in present tables 9.3 and 9.4 of SOLAS chapter II-2, should be increased from the current "A-0" to "A-30" class. In addition, taking into account the fire integrity standards for cargo ships, it is also proposed that:

- .1 the fire integrity value of bulkheads between ro-ro spaces or special category spaces and corridors or stairway, as prescribed in the current table 9.3 of SOLAS chapter II-2 be raised from "A-15" to "A-30";
- .2 the fire integrity value of decks between ro-ro spaces or special category spaces (space below) and corridors or stairway (space above), as prescribed in the current table 9.4 of SOLAS chapter II-2, be raised from "A-15" to "A-30";
- .3 the fire integrity value of decks between ro-ro spaces or special category spaces (space above) and corridors or stairway (space below), as prescribed in the current table 9.4 of SOLAS chapter II-2, be raised from "A-0" to "A-30";
- .4 the fire integrity value of decks between ro-ro spaces or special category spaces (spaces above) and control stations (space below), as prescribed in the current table 9.4 of SOLAS chapter II-2, be raised from "A-30" to "A-60"; and
- .5 the fire integrity value of decks between ro-ro spaces or special category spaces (spaces below) and machinery spaces of category A (space above), as prescribed in the current table 9.4 of SOLAS chapter II-2, be raised from "A-30" to "A-60".

11 The revised fire integrity of bulkheads and decks between ro-ro spaces or special category spaces and adjacent spaces of passenger ships carrying no more than 36 passengers, as proposed, is shown in tables 9.3 and 9.4 below (the fire integrity value with brackets are revised ones, and the values in shadow are proposed to be deleted):

Table 9.3 – Fire integrity of bulkheads separating adjacent spaces of passenger ships carrying not more than 36 passengers (shown only with the values between ro-ro spaces or vehicle spaces and adjacent spaces)

Space	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control Stations (1)											("A-60") "A-30"
Corridors (2)											("A-30") "A-15"
Accommodation Spaces (3)											"A-30" "A-0d"
Stairways (4)											("A-30") "A-15"
Service spaces (low risk) (5)											"A-0"
Machinery spaces of category A (6)											"A-60"
Other machinery spaces (7)											"A-0"
Cargo spaces (8)											"A-0"
Service spaces (high risk) (9)											A-30
Open deck (10)											"A-0"
Special category and ro-ro spaces (11)											("A-30") "A-0"

Table 9.4 – Fire integrity of decks separating adjacent spaces of passenger ships carrying not more than 36 passengers (shown only with the values between ro-ro spaces or vehicle spaces and adjacent spaces)

Space above → Space ↓ below	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control Stations (1)											("A-60") "A-30"
Corridors (2)											("A-30") "A-0"
Accommodation Spaces (3)											"A-30" "A-0d"
Stairways (4)											("A-30") "A-0"
Service spaces (low risk) (5)											"A-0"
Machinery spaces of category A (6)											"A-60"
Other machinery spaces (7)											"A-0"
Cargo spaces(8)											"A-0"
Service spaces (high risk) (9)											"A-30"
Open deck (10)											"A-0"
Special category and ro-ro spaces (11)	"A-60"	("A-30") "A-15"	"A-30" "A-0d"	("A-30") "A-15"	"A-0"	("A-60") "A-30"	"A-0"	"A-0"	"A-30"	"A-0"	("A-30") "A-0"

12 In light of the changes of categorization for ro-ro spaces, it is suggested that paragraphs 9.6.2 and 9.6.3 of SOLAS chapter II-2 should be deleted.

ACTION REQUESTED OF THE SUB-COMMITTEE

13 The Sub-Committee is invited to consider the aforementioned proposals and take action as appropriate.