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7 January 2011

To: PASSENGER SHIP PANEL

PSP(11)01

Copy: All Full and Associate Members (for information)
Marine Committee

GUIDANCE FOR WATERTIGHT DOORS ON PASSENGER SHIPS WHICH MAY BE OPENED DURING NAVIGATION

Action Required: Members are invited to note and disseminate the IMO MSC circular at Annex A which provides guidance for Administrations and companies when considering if watertight doors on passenger ships may be opened during navigation.

At the 54th session of the IMO Design and Equipment Sub-Committee, guidance was finalised to assist Administrations in consideration of the impact of open watertight doors on survivability of passenger ships during operations when determining whether a door may remain open during navigation.

The circular contains guidance on when watertight doors may be opened or should remain closed, what markings and postings are required and details of the responsibility of companies (as defined in SOLAS IX/1.2) to conduct a risk assessment and to consider the ship's survivability when applying for any watertight door to be allowed to remain open in certain circumstances.

Appendix 1 of the annexed guidance includes a floatability assessment for the purpose of determining the impact of open watertight doors on ship survivability once the need for a watertight door to remain open during navigation has been established.

It is important to note that where watertight doors on existing vessels have previously been permitted to remain open, it was agreed that the Administration, may at its discretion, continue to permit these doors to remain open.

The guidance has a pragmatic approach and therefore non compliance with a floatability assessment might not necessarily prevent permission for a door to remain open in normal operational conditions; however, the results of an assessment have to be taken into account. In addition if the specific survivability assessment requirements are met, it is possible that an administration may grant permission for a watertight door to remain open during navigation even in potentially hazardous conditions.

Members are invited to forward any requests for further information or comments to the undersigned.

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**GUIDANCE FOR WATERTIGHT DOORS ON PASSENGER SHIPS WHICH MAY BE
OPENED DURING NAVIGATION**

1 The Maritime Safety Committee, at its eighty-eighth session (24 November to 3 December 2010), with a view to assisting Administrations in carefully considering the impact of open watertight doors on passenger ships operation and survivability when determining whether a watertight door may remain open during navigation under SOLAS regulation II-1/22 (paragraph 4) (previous SOLAS regulation II-1/15, paragraph 9.3), approved the annexed Guidance for watertight doors on passenger ships which may be opened during navigation, prepared by the Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety, at its fifty-second session, and the Sub-Committee on Ship Design and Equipment, at its fifty-fourth session.

2 The Guidance contains the following appendices:

- .1 Procedure for the determination of the impact of open watertight doors on passenger ship survivability (floatability assessment) (appendix 1);
- .2 Technical standards for watertight doors on passenger ships (appendix 2);
- .3 Flowchart on Guidance for permitting watertight doors on passenger ships to remain open during navigation (appendix 3); and
- .4 Illustration of application of the floatability assessment under hazardous conditions in the Guidance (appendix 4).

3 Member Governments are invited to apply the annexed Guidance from 1 January 2011 and bring it to the attention of recognized organizations, ship designers, shipbuilders, manufacturers, companies, shipowners, operators and any other parties concerned.

ANNEX

GUIDANCE FOR WATERTIGHT DOORS ON PASSENGER SHIPS WHICH MAY BE OPENED DURING NAVIGATION

1 Preamble

1.1 Watertight subdivision is vital to ship stability and survivability to protect life, property and the marine environment in cases of hull damage after collision or grounding. The number of openings in watertight bulkheads on passenger ships is to be kept to a minimum in accordance with SOLAS regulation II-1/13.1 (previous SOLAS regulation II-1/15.1).

1.2 In order to maintain watertight subdivision, while allowing for the safe and effective operation of the ship, all watertight doors are to be kept closed during navigation, except in certain limited circumstances. SOLAS regulation II-1/22.3 (previous SOLAS regulation II-1/15.9.2), allows a watertight door to be temporarily opened to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. In this case, the door must be immediately closed when transit through the door is complete or the work is finished. Additionally, SOLAS regulation II-1/22.4 (previous SOLAS regulation II-1/15.9.3) permits certain watertight doors to remain open during navigation but only if considered absolutely necessary to the safe and effective operation of the ship's machinery or to permit passengers normally unrestricted access throughout the passenger area. This determination is made by the Administration after careful consideration of the impact on ship operations and survivability.

1.3 SOLAS chapter II-1 regulations, referred to in this Guidance, means SOLAS chapter II-1 regulations amended by resolution MSC.216(82) (entered into force on 1 January 2009); and previous SOLAS chapter II-1 regulations means regulations amended by resolution MSC.13(57) (entered into force on 1 February 1992) and by other amendments afterwards.

2 Introduction

This Guidance is intended to assist Administrations in carefully considering the impact of open watertight doors on passenger ships operations and survivability when determining whether a watertight door may remain open during navigation for the safe and effective operation of the ship's machinery or to permit passengers normally unrestricted access throughout the passenger area. Guidance is also provided on when watertight doors may be opened or should remain closed.

3 The importance of watertight doors

3.1 Failure to recognize the importance of watertight doors can have great impact on the watertight integrity of the ship and have catastrophic consequences. When structural damage occurs to a ship, especially during collision or grounding, there is potential risk for bulkheads and decks to be deformed, thus rendering watertight doors not able to be closed. The risk of progressive flooding following such deformation of the ship's structure may increase if watertight doors are either left open or unable to be closed.

3.2 Another potential risk to ship survivability is when large amounts of water flood a ship, especially after extensive structural damage. The rate of water ingress, which depends on the size of the damaged opening and the water pressure, can quickly flood a compartment. It is therefore essential that a ship has sufficient survivability in case of damage, keeping in mind that

when adjacent watertight doors are open, several compartments may be flooded as watertight doors have up to 60 seconds to close per SOLAS regulation II-1/13.5.1 (previous SOLAS regulation II-1/15.6.1).

4 Operation of watertight doors

Power-operated watertight doors are designed to be remotely closed in a short period of time with a force the magnitude of which is sufficient to overcome not only the weight of the door but also water flowing through its opening, both while a ship is listing 15° in either direction. The operation of watertight doors involves possible dangers to persons passing through a closing door and injury or loss of life is likely to occur to anyone trapped in the door's path. The audible alarm that sounds for a few seconds before the door starts moving, and continues sounding while the door is in motion, is intended to reduce the human element risk.

5 SOLAS regulation and technical standards for watertight doors

5.1 SOLAS regulation II-1/13 (previous SOLAS regulation II-1/15) provides the technical standards for watertight doors in passenger ships constructed on or after 1 February 1992. The basis of this regulation is that all watertight doors shall be kept closed during navigation according to SOLAS regulation II-1/22.1 (previous SOLAS regulation II-1/15.9.1), except as follows:

- .1 watertight doors may be opened during navigation to permit the passage of passengers or crew, or when work in the immediate vicinity of the door necessitates it being opened. The door must be immediately closed when transit through the door is complete or when the task which necessitated it being open is finished; and
- .2 certain watertight doors may be permitted to remain open during navigation only if considered absolutely necessary according to SOLAS regulation II-1/22.4 (previous SOLAS regulation II-1/15.9.3); that is, being open is determined essential to the safe and effective operation of the ship's machinery or to permit passengers normally unrestricted access throughout the passenger area. Such determination shall be made by the Administration only after careful consideration of the impact on ship operations and survivability. A watertight door permitted to remain open shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed.

5.2 For passenger ships constructed before 1 February 1992, watertight doors that do not comply with SOLAS regulations II-1/13.5.1 to 13.5.3 and 13.6 (previous SOLAS regulations II-1/15.6.1 to 15.6.4) shall be closed before the voyage commences and shall be kept closed during navigation. In other words, such doors shall never be permitted to be opened during a voyage. Administrations may use the watertight door checklist in appendix 2 to assess pre-1992 ships for potential compliance with SOLAS regulations II-1/13.5.1 to 13.5.3 and 13.6 (previous SOLAS regulations 15.6.1 to 15.6.4), which also includes the requirements in paragraph 7 of SOLAS regulation II-1/13 (previous SOLAS regulation II-1/15).

6 Categories of watertight doors

In order to assist Administrations in determining to what extent watertight doors may remain open during navigation, watertight doors may be categorized into one of four different types of doors:

.1 Category A doors:

A watertight door that fulfils the technical requirements in SOLAS regulations II-1/13.5.1 to 13.5.3 and 13.6 (previous SOLAS regulations II-1/15.6.1 to 15.6.4), which also includes the requirements in paragraph 7 of SOLAS regulation II-1/13 (previous SOLAS regulation II-1/15), and has been permitted to remain open during navigation by the Administration according to SOLAS regulation II-1/22.4 (previous SOLAS regulation II-1/15.9.3).

.2 Category B doors:

A watertight door that fulfils the technical requirements in SOLAS regulations II-1/13.5.1 to 13.5.3 and 13.6 (previous SOLAS regulations II-1/15.6.1 to 15.6.4), which also includes the requirements in paragraph 7 of SOLAS regulation II-1/13 (previous SOLAS regulation II-1/15), and may be opened during navigation when work in the immediate vicinity of the door necessitates it being opened, according to SOLAS regulation II-1/22.3 (previous SOLAS regulation II-1/15.9.2). The door must be immediately closed when the task which necessitated it being open is finished.

.3 Category C doors:

A watertight door that fulfils the technical requirements in SOLAS regulations II-1/13.5.1 to 13.5.3 and 13.6 (previous SOLAS regulations II-1/15.6.1 to 15.6.4), which also includes the requirements in paragraph 7 of SOLAS regulation II-1/13 (previous SOLAS regulation II-1/15), and may be opened during navigation to permit the passage of passengers or crew, according to SOLAS regulation II-1/22.3 (previous SOLAS regulation II-1/15.9.2). The door must be immediately closed when transit through the door is complete.

.4 Category D doors:

.1 A watertight door that does not comply with SOLAS regulations II-1/13.5.1 to 13.5.3 and 13.6 (previous SOLAS regulations II-1/15.6.1 to 15.6.4), which also includes the requirements in paragraph 7 of SOLAS regulation II-1/13 (previous SOLAS regulation II-1/15), shall be closed before the voyage commences and shall be kept closed during navigation according to SOLAS regulation II-1/22.1 (previous SOLAS regulation II-1/15.6.5 (refer to paragraph 5.2)).

.2 Additionally, watertight doors fitted in watertight bulkheads dividing cargo between deck spaces in accordance with SOLAS regulation II-1/13.9.1 (previous SOLAS regulation II-1/15.10.1), shall be closed before the voyage commences and shall be closed during navigation according to SOLAS regulation II-1/22.6 (previous SOLAS regulation II-1/15.10.2). Such a watertight door is not eligible for upgrade to another category.

7 Permission for category A watertight doors to remain open

7.1 When applying to the Administration for permission for a watertight door to be qualified as a category A watertight door, the Company, as defined in SOLAS regulation IX/1.2, should conduct a risk assessment and consider the ship's survivability as a primary issue. The scope of the risk assessment should be balanced against operational needs.

7.2 The Administration, when permitting watertight doors to remain open, should take into account the outcome of the risk assessment conducted by the Company, which includes the procedure for the determination of the impact of open watertight doors on passenger ship survivability, set out in appendix 1 (hereinafter "floatability assessment").

7.3 The Administration may continue to permit those watertight doors (refer to paragraph 6.1), which have been permitted to remain open during navigation prior to this Guidance becoming effective, to remain open during navigation. However, this does not restrict an Administration from reconsidering whether any category A watertight doors should remain open when operating under the conditions described in paragraph 9.

7.4 The necessity for a watertight door to remain open during navigation should be demonstrated by the Company. The Company should satisfy the Administration with relevant information, such as operational needs, number of passages through the watertight door per time unit, alternative passageways around the watertight door and results from the risk assessment. The Company should also submit a copy of the relevant sections of their safety management procedures relating to the operation of watertight doors during navigation, as well as related information such as restrictions or limitations on when watertight doors may remain open.

7.5 Before permitting a watertight door to remain open during navigation, the Administration should evaluate the information described in 7.1 and 7.4 and verify that:

- .1 the watertight door meets the technical requirements of SOLAS regulations II-1/13.5.1 to 13.5.3 and 13.6 (previous SOLAS regulations II-1/15.6.1 to 15.6.4), which also includes the requirements in paragraph 7 of SOLAS regulation II-1/13 (previous SOLAS regulation II-1/15);
- .2 the floatability assessment (appendix 1) has been taken into account; and
- .3 the proposed category A watertight door meets the criteria specified in SOLAS regulation II-1/22.4 (previous SOLAS regulation II-1/15.9.3).

7.6 The flowchart in appendix 3 and the checklist for the technical standards of the watertight doors in appendix 2 may be used as guidance in the evaluation.

7.7 It is also important for an Administration to envisage the conditions under which adjacent watertight doors of category B or C may be opened during navigation for certain limited periods of time as permitted by SOLAS regulation II-1/22.3 (previous SOLAS regulation II-1/15.9.2), with a view towards preserving watertight subdivision and enhancing survivability. Additional factors, such as the area in which the ship is operating, should also be assessed to consider any additional risks or potentially hazardous situations (see list in paragraph 9 for consideration of such risks).

7.8 All category A doors shall be clearly indicated in the ship's stability information and shall always be ready to be immediately closed. Instructions regarding these watertight doors should be incorporated in the ship's safety management system and included in the ship's operational limitations in accordance with SOLAS chapter V requirements.

7.9 A watertight door should not be permitted to remain open during navigation in potentially hazardous situations, if the ship does not meet the floatability criteria given in section 3 in appendix 1 for each associated extent of flooding.

7.10 A watertight door may be permitted to remain open when operating under normal situations as defined in paragraph 10.3, if the ship does not meet the floatability criteria when the overall risk assessment indicated a level of safety acceptable to the Administration.

8 Considerations to be made on categories B and C watertight doors which may be opened for limited periods, or for passage

A watertight door of category B or C should be clearly indicated in the ship's stability information and should always be ready to be immediately closed. Category D doors should also be clearly indicated in the ship's stability information.

9 Factors restricting the operation of watertight doors

Certain operating conditions, or combinations of several factors, should necessitate categories A, B and C doors being closed during navigation to preserve survivability. In particular, the area in which the ship is operating should be continually evaluated for associated risks with any potentially hazardous conditions. Except for category A doors for which the ship satisfies the floatability assessment criteria, it is recommended that categories A, B and C doors are kept closed during navigation while the ship is operating:

- .1 in waters with high traffic density;
- .2 near coastal waters;
- .3 in heavy weather;
- .4 in dangerous ice conditions;
- .5 in waters where soundings are unreliable;
- .6 during periods of restricted visibility;
- .7 within port limits or compulsory pilotage waters;
- .8 when loose objects are nearby, which could potentially prevent the watertight door from being closed; or
- .9 under any condition when the ship's master considers the situation to necessitate all watertight doors to be closed.

10 Operational instructions, markings and postings

10.1 Operational instructions

Operational instructions for watertight doors should be included in the ship's stability information and address the situations described in paragraphs 10.2 and 10.3. Additionally:

- .1 a copy of the operational instruction should be located at the central operating console at the navigation bridge so as to be readily available to the officer in charge of the navigation watch;
- .2 the operational instructions should state the means of verifying the correct position of all watertight doors; and
- .3 the operational instructions should cover procedures for operating watertight doors to permit safe passage of passengers, in particular, that watertight doors should only be operated by qualified persons and not by passengers.

10.2 Operational instructions in potentially hazardous situations

10.2.1 A potentially hazardous situation is defined as a situation when the ship is on a voyage and operating in conditions as described in paragraph 9.

10.2.2 The operational instructions should specify that, while the ship is navigating in potentially hazardous situations, every watertight door of category A, B or C be closed except for category A doors for which the ship satisfies the floatability assessment criteria, or when a person is passing through it. If such doors are opened for passage then it should be closed immediately after passage.

10.3 Operational instructions in normal situations

10.3.1 A normal situation is defined as a non-hazardous situation when the ship is on a voyage and operating in conditions other than as described in paragraph 9.

10.3.2 The operational instructions should specify that while the ship is navigating in normal situations each watertight door of category A, B or C be operated in accordance with the assigned category (see paragraph 6).

10.4 Markings and postings

10.4.1 The assigned category and meaning of each category should clearly be marked on both sides of either the watertight door or the bulkhead adjacent to the door in order to ensure correct operation.

10.4.2 The assigned category for each door should be indicated on or near the central operating console located on the navigation bridge in order that the correct status of all doors can be ascertained.

Appendix 1

PROCEDURE FOR THE DETERMINATION OF THE IMPACT OF OPEN WATERTIGHT DOORS ON PASSENGER SHIPS SURVIVABILITY (FLOATABILITY ASSESSMENT)

1 Introduction

1.1 This floatability assessment is only for the purpose of determining the impact of open watertight doors on ship survivability under SOLAS regulation II-1/22.4 (previous SOLAS regulation II-1/15.9.3). It is intended that this floatability assessment be applied only after the need for a watertight door(s) to remain open during navigation is established.

1.2 Care should be exercised not to confuse the "floatability assessment" criteria used in this procedure (for determining the impact of open watertight doors on survivability) with the requirements in the SOLAS chapter II-1 damage stability regulations.

2 Damage and flooding extent for the floatability assessment

2.1 In every case in which a determination that keeping one or more watertight doors open during navigation is absolutely necessary, floatability assessment calculations should be performed.

2.2 The extent of damage to be assumed for the floatability assessment should be as defined in SOLAS regulation II-1/8.3. In addition, watertight compartments inboard of the transverse extent of damage should be assumed flooded, irrespective of whether any longitudinal bulkheads are fitted with watertight doors, if:

- .1 the inboard compartment is within the longitudinal damage extent; and
- .2 the inboard compartment is connected by the watertight door(s) under investigation which are proposed to remain open during navigation.

If any lesser damage extents than indicated above would result in a more severe condition with respect to the floatability criteria, then such damage extents should be assumed in the calculations. In this context, the damage extent should be assumed as both penetrating and not penetrating the double bottom.

2.3 The floatability assessment should account for the worst cases involving the additional flooding of compartments connected with watertight doors requested to remain open during navigation. The extent of flooding assumed for the floatability assessment calculations should be as follows: any watertight door that is requested to remain open during navigation may be considered closed in each case of flooding if it is in a watertight bulkhead that is located away from the damage extent by at least one undamaged transverse watertight bulkhead/door.

3 Criteria for the floatability assessment





3.1 For each assumed flooding case described in section 2, the floatability criteria described below should be met at the deepest subdivision draught at level trim. For this loading condition, the limiting KG or GM should be assumed in the calculations.

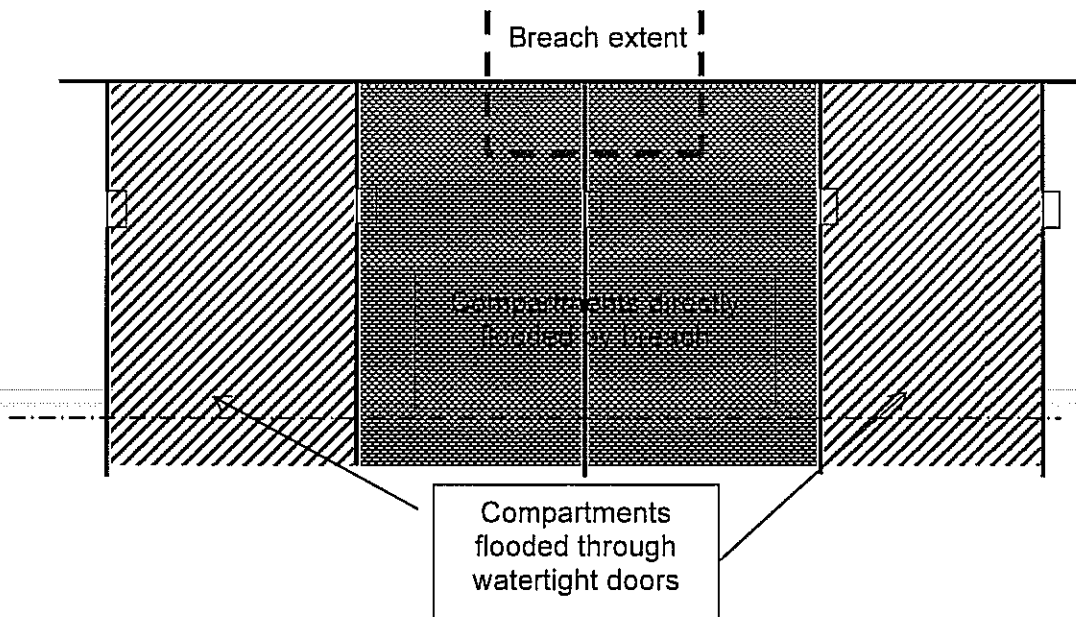
- .1 The bulkhead deck may be immersed provided that no progressive flooding occurs (i.e. weathertight openings may not be immersed; only watertight openings may be immersed).
 - .2 The maximum positive righting lever should not be less than 0.05 m.
 - .3 The range of positive righting levers should not be less than 7°.
 - .4 The maximum equilibrium heel angle should not exceed 15°.
- 3.2 The Administration may accept alternative methodologies if it is satisfied that at least the same degree of safety as represented by this procedure is achieved (reference is made to SOLAS regulation II-1/4.2).

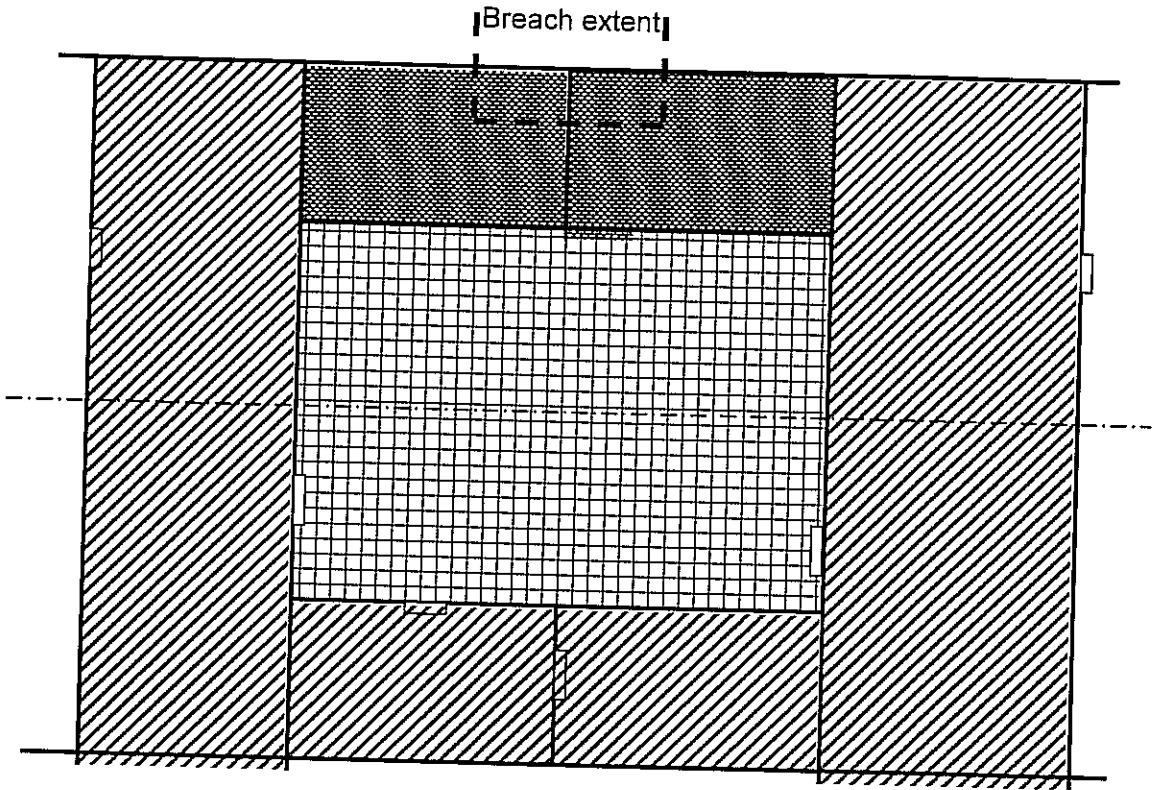
Attachment
Explanatory sketches

Notes:

- 1 In the sketches below, all the doors are assumed "permitted to remain open during navigation".
- 2 In case of a ship carrying less than 400 persons, breach should only be considered between transverse bulkheads (if spaced by more than $0.03 \cdot L$).

-  Watertight door permitted to remain open during navigation
-  Direct flooding (§2.2)
-  Additional flooding according to §2.2
-  Additional flooding according to §2.3





Appendix 2

TECHNICAL STANDARDS FOR WATERTIGHT DOORS ON PASSENGER SHIPS

Only after careful consideration of the impact on ship operations and survivability should an Administration permit a watertight door to remain open during navigation. This watertight door checklist has been designed to assist an Administration in making such a determination through validation of each technical standard. Other non-technical considerations are contained in the main guidance document.

Ship	
Date:	
Door(s) No.	

Note: SOLAS regulations referred to in parentheses are previous SOLAS chapter II-1 regulations.

Technical Standards	Yes	No	Comments
Passenger ship constructed on or after 1 February 1992 (Date of new amendments)			
SOLAS regulation II-1/13.5.1 (15.6.1) Can the door be closed simultaneously from navigation bridge in not more than 60 seconds?			
SOLAS regulation II-1/13.5.2 (15.6.2) Can the door be closed with the ship listed to 15° in either direction and with a static head of water 1 m above the sill?			
SOLAS regulation II-1/13.5.3 (15.6.3) Are controls located close to the door, such that if damage is sustained within one fifth of the breadth of the ship the door will continue to operate?			
SOLAS regulation II-1/13.6 (15.6.4) Is there an indicator to show all remote operating positions whether the door is open or closed at the navigation bridge and at the location where hand operation above deck is required?			
SOLAS regulation II-1/13.7.1.1 (15.7.1.1) Does the door have a vertical or horizontal motion?			
SOLAS regulation II-1/13.7.1.2 (15.7.1.2) Does the door have a maximum clear opening width of 1.2 m or less?			
SOLAS regulation II-1/13.7.1.2.1 (15.7.1.2.1) For doors greater than 1.2 m wide, has special consideration been given to the strength of the door and its closing appliance in order to prevent leakage?			
SOLAS regulation II-1/13.7.1.2.2 (15.7.1.2.2) For doors greater than 1.2 m wide, is it located outside the damage zone B/5?			
SOLAS regulation II-1/22.1 (15.7.1.2.3) For doors greater than 1.2 m wide, will it be kept closed when the ship is at sea except for limited periods when absolutely necessary?			

Technical Standards	Yes	No	Comments
SOLAS regulation II-1/13.7.1.3 (15.7.1.3) Are the doors fitted with necessary equipment to close and open the door using electrical power, hydraulic power or any other form of power that is acceptable to the Administration?			
SOLAS regulation II-1/13.7.1.4 (15.7.1.4) Is individual hand-operated mechanism provided for each door that permits it to be open or closed from either side and from above the bulkhead deck within 90 seconds?			
SOLAS regulation II-1/13.7.1.4 (15.7.1.4) Is direction of rotation or other movement clearly indicated and displayed at all operating positions?			
SOLAS regulation II-1/13.7.1.5 (15.7.1.5) Is the door provided with controls for opening and closing the door by power from both sides of the door and also for closing the door by power from the central operating console at the navigating bridge?			
SOLAS regulation II-1/13.7.1.6 (15.7.1.6) Is the door provided with an audible alarm, distinct from any other alarm in the area, which will sound whenever the door is closed remotely by power for at least 5 seconds, but no more than 10 seconds, before the door begins to move and shall continue sounding until the door is completely closed?			
SOLAS regulation II-1/13.7.1.6 (15.7.1.6) During remote hand operation, does the audible alarm sound when the door is moving?			
SOLAS regulation II-1/13.7.1.6 (15.7.1.6) Is the audible alarm supplemented by intermittent visual signal at the door in passenger areas of high ambient noise (if so required by Administration)?			
SOLAS regulation II-1/13.7.1.7 (15.7.1.7) Does the door have a uniform rate of closure under power that allows the door to be closed in no less than 20 seconds and no more than 40 seconds with the ship in the upright position?			
SOLAS regulation II-1/15.7.2 Is the electrical power supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck?			
SOLAS regulation II-1/13.7.2 (15.7.2) Are the associated control, indication and alarm circuits supplied from the emergency switchboard either directly or by a dedicated distribution board situated above the bulkhead deck and capable of being automatically supplied by the transitional source of emergency electrical power required by SOLAS regulation 42.3.1.3 in the event of failure of either the main or emergency source of electrical power?			
SOLAS regulation II-1/13.7.3.1 (15.7.3.1), requires 13.7.3.1 or 3.2 or 3.3 (15.7.3.1 or 3.2 or 3.3) Is there a centralized hydraulic system with two independent power sources each consisting of a motor and pump capable of simultaneously closing all doors with hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e. closed-open-closed, against an adverse list of 15°?			

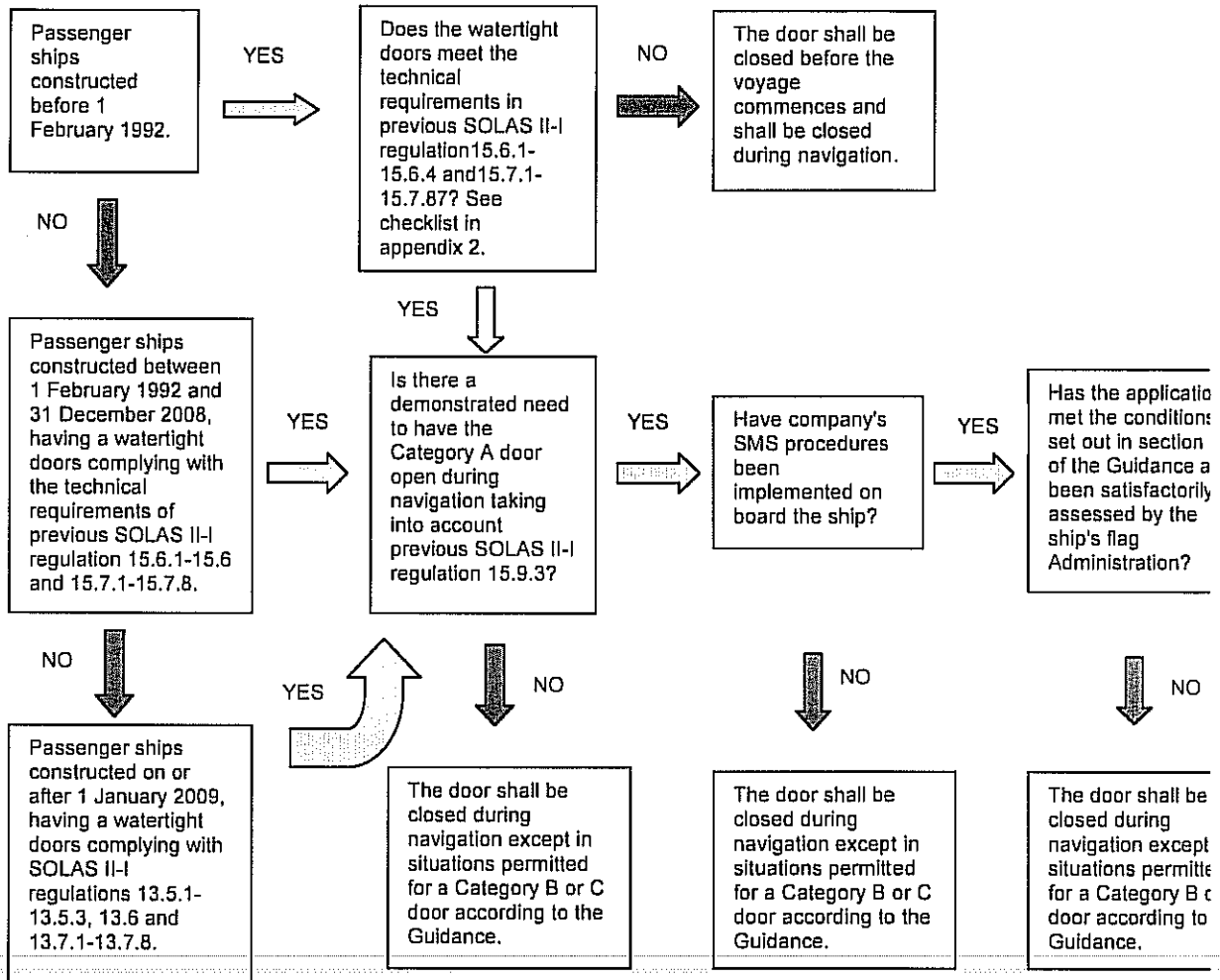
Technical Standards	Yes	No	Comments
<p>SOLAS regulation II-1/13.7.3.2 (15.7.3.2), requires 13.7.3.1 or 3.2 or 3.3 (15.7.3.1 or 3.2 or 3.3)</p> <p>Is there an independent hydraulic system for each door with each power source consisting of a motor and pump capable of opening and closing the door with a hydraulic accumulator of sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°?</p>			
<p>SOLAS regulation II-1/13.7.3.3 (15.7.3.3), requires 13.7.3.1 or 3.2 or 3.3 (15.7.3.1 or 3.2 or 3.3)</p> <p>Is there an independent electrical system and motor for each door with each power source consisting of a motor capable of opening and closing the door that is automatically supplied by the transitional source of emergency electrical power, as required by SOLAS regulation 42.4.2, in the event of failure of either the main or emergency source of electrical power and with sufficient capacity to operate the door at least three times, i.e. closed-open-closed, against an adverse list of 15°?</p>			
<p>SOLAS regulation II-1/13.7.3 (15.7.3)</p> <p>Are there alarms for low pressure/level or loss of electrical power?</p>			
<p>SOLAS regulation II-1/13.7.3 (15.7.3)</p> <p>Are the power systems separated from all other power systems such that a single failure in the electric or hydraulic power-operated systems excluding the hydraulic actuator shall not prevent the hand operation of any door?</p>			
<p>SOLAS regulation II-1/13.7.4 (15.7.4)</p> <p>Are controls handles provided at each side of the bulkhead at a minimum height of 1.6 m above the floor and arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the power closing mechanism in operation accidentally?</p>			
<p>SOLAS regulation II-1/13.7.4 (15.7.4)</p> <p>Is the direction of movement of the handles in opening and closing the door in the direction of door movement and clearly indicated?</p>			
<p>SOLAS regulation II-1/13.7.5 (15.7.5)</p> <p>Are as far as practicable, electrical equipment and components for watertight doors situated above the bulkhead deck and outside hazardous areas and spaces?</p>			
<p>SOLAS regulation II-1/13.7.6 (15.7.6)</p> <p>Do the enclosures of electrical components necessarily situated below the bulkhead deck provide suitable protection against the ingress of water? (See footnote in SOLAS)</p>			
<p>SOLAS regulation II-1/13.7.7 (15.7.7)</p> <p>Are electric power, control, indication and alarm circuits protected against fault in such way that a failure in one door circuit will not cause a failure in any other door circuit?</p>			
<p>SOLAS regulation II-1/13.7.7 (15.7.7)</p> <p>Are short circuits or other faults in the alarm or indicator circuits of a door protected from causing a loss of power operation of that door?</p>			

Technical Standards	Yes	No	Comments
SOLAS regulation II-1/13.7.7 (15.7.7) Does the arrangement prevent leakage of water into the electrical equipment located below the bulkhead?			
SOLAS regulation II-1/13.7.8 (15.7.8) Will a single electrical failure in the power operating or control system of a power-operated sliding watertight door be protected from causing a closed door to open?			
SOLAS regulation II-1/13.7.8 (15.7.8) Is the availability of the power supply continuously monitored at a point in the electrical circuit as near as practicable to each of the motors required by paragraph 7.3?			
SOLAS regulation II-1/13.7.8 (15.7.8) Does the loss of any such power supply activate an audible and visual alarm at the central operating console at the navigating bridge?			
SOLAS regulation II-1/13.8.1 (15.8.1)* Is the central operating console at the navigating bridge provided with a "master mode" switch with two modes of control that provide for a "local control" mode for any door to be locally opened and locally closed after use without automatic closure, and a "doors closed" mode to automatically close any door that is open?			
SOLAS regulation II-1/13.8.1 (15.8.1)* Does the "doors closed" mode permit doors to be opened locally and automatically re-close the doors upon release of the local control mechanism?			
SOLAS regulation II-1/13.8.1 (15.8.1)* Does the "master mode" switch normally remain in the "local control" mode, allowing the "doors closed" mode to only be used in an emergency or for testing purposes?			
SOLAS regulation II-1/13.8.2 (15.8.2)* Is the central operating console at the navigating bridge provided with a diagram showing the location of each door, with visual indicators to show whether each door is open or closed, such that a red light indicates a door is fully open and a green light indicates a door is fully closed?			
SOLAS regulation II-1/13.8.2 (15.8.2)* When the door is closed remotely, does the red light indicate the intermediate position by flashing?			
SOLAS regulation II-1/13.8.2 (15.8.2)* Is the indicating circuit independent of the control circuit for each door?			
SOLAS regulation II-1/13.8.3 (15.8.3)* Is the possibility to remotely open any door from the central operating console ruled out?			

* These regulations are not required for upgrade in previous SOLAS regulation II-1/15.6.5.

Appendix 3

FLOWCHART GUIDANCE FOR PERMITTING WATERTIGHT DOORS ON PASSENGER SHIPS TO REMAIN



Appendix 4

ILLUSTRATION OF APPLICATION OF THE FLOATABILITY ASSESSMENT UNDER HAZARDOU:

		Assess the floatability as a part of the risk assessment		Comply with floatability criteria		
		yes	no	yes	no	
Category A	after the Guidance effective	x		x		
Category A-	after the Guidance effective	x			x	
Category A	before the Guidance effective	x		x		
Category A-	before the Guidance effective		x		x	TE
Category B			N/A		N/A	
Category C			N/A		N/A	
Category D			N/A		N/A	