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SUB-COMMITTEE ON STABILITY AND
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DEVELOPMENT OF EXPLANATORY NOTES FOR HARMONIZED SOLAS CHAPTER II-1

Consideration on the requirements for pipes piercing the collision bulkheads

Submitted by the International Association of Classification Societies (IACS)

SUMMARY

<i>Executive summary:</i>	This document seeks clarification of the requirements concerning pipes piercing the collision bulkheads in the amended SOLAS chapter II-1 adopted by resolution MSC.194(80)
<i>Strategic direction:</i>	2
<i>High-level action:</i>	2.1.1
<i>Planned output:</i>	2.1.1.2
<i>Action to be taken:</i>	Paragraph 10
<i>Related document:</i>	MSC.194(80)

Background

1 The provisions of regulation II-1/12.5.1 of the amended SOLAS chapter II-1 (resolution MSC.194(80) which enters into force on 1 January 2009) permit pipes to pierce the ship's collision bulkhead below the bulkhead deck only when:

- (1) the number of the pipes is not more than one, except where permitted by regulation 12.5.2;
- (2) the pipe is fitted with a screw-down valve capable of being operated from above the bulkhead deck; and
- (3) the valve chest is secured inside the forepeak to the collision bulkhead except where the Administration is satisfied that the valve is readily accessible under all service conditions and the space in which it is located is not a cargo space.

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2 The above-mentioned requirements are different from previous requirements for cargo ships (regulation II-1/11.4) in the following points:

- (1) Valves for this purpose are now to be of a screw-down type.
- (2) Only one pipe is now allowed to pierce the collision bulkhead when a space forward the bulkhead is not divided in two or more divisions for different kinds of liquids.

Current design practice in cargo ships

3 In current designs of cargo ships, butterfly valves, generally secured to the bulkhead structures by penetration pieces, are widely used as bulkhead valves and, as permitted by SOLAS, as skin valves for overboard pipes, for the following reasons: (See Fig.1 below)

- (1) Their operating mechanism is very simple.
- (2) Necessary operation force is lower than that for other type valves.
- (3) It is easier to cope with fit up to pipes.
- (4) Size of a valve can be smaller than that of other type valves having same capacities.

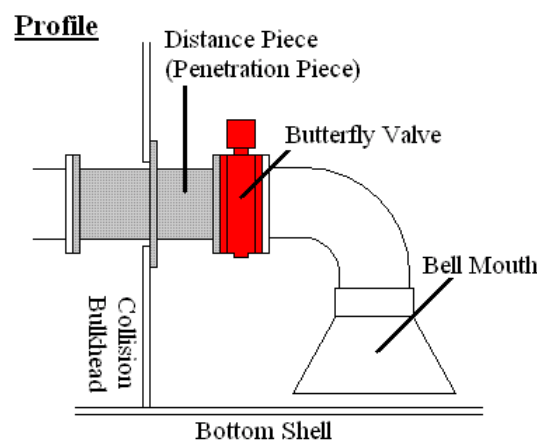


Fig.1

4 For large ships, it is frequent that two discharges are provided in accordance with ship operators' request, since it is very difficult to discharge water from a large fore peak tank that is provided with only one discharge having a valve located within the tank. Also, two valves provide redundancy in the event one were to fail. Typical piping arrangements are shown in Fig.2 and Fig.3 below. In these cases, the bulkhead valves are secured to the bulkhead structures (e.g., vertical webs of the bulkheads) by penetration pieces and/or short branch pipes.

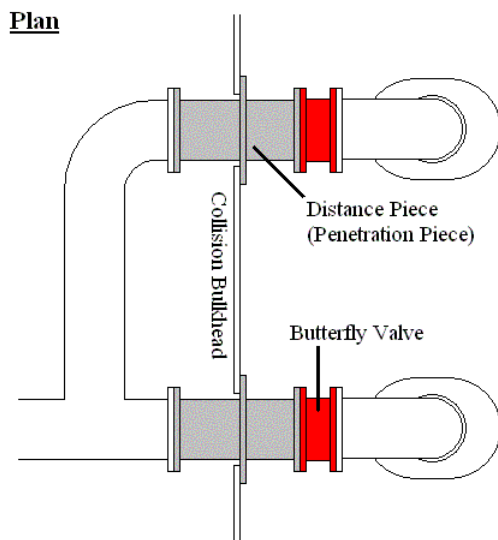
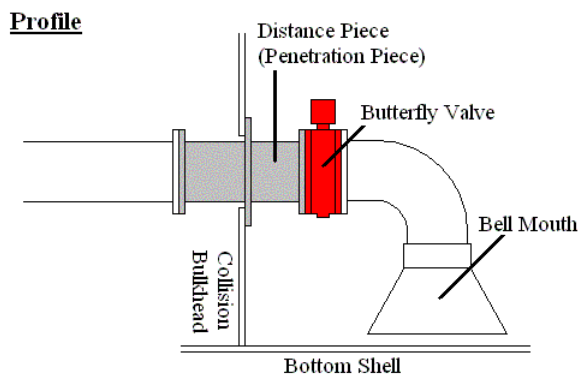


Fig.2

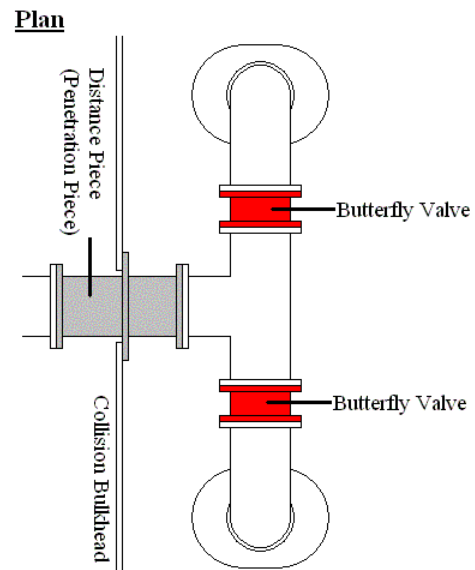
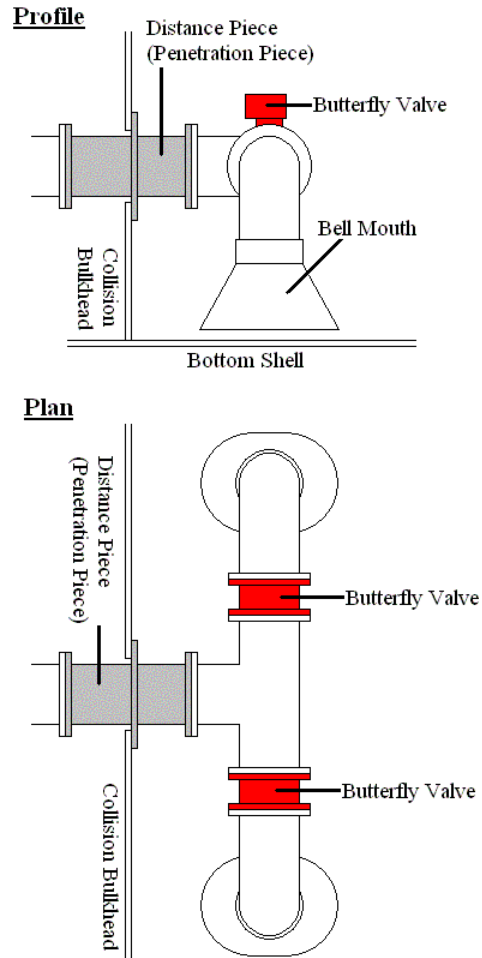


Fig.3

Discussions on valve type

5 Considering the following situations, IACS can not find a strong reason to prohibit the use of butterfly valves for this purpose.

- (1) Butterfly valves have been widely used for this purpose and no serious casualties caused by a damage or failure of the valve have been reported.
- (2) Piping is usually designed so that progressive flooding through it cannot occur by a single damage or failure. For example, ballast piping is fitted with valves at the pump side and the boundaries of each tank, if served for other tanks.
- (3) Butterfly valves have been widely used in overboard discharge pipes, which are required to have more stringent integrity.
- (4) Valves of other types having larger sizes necessary for tank operations of larger ships are not available in the market.
- (5) IACS is not aware of any record/evidence of discussion justifying the change of requirements noted in paragraph 2, above.

6 Accordingly, IACS considers that, unless some justification for the use of screw-down valves can be provided, butterfly valves provide a means as effective as a screw-down valve to ensure the integrity of pipes piercing the ship's collision bulkhead below the bulkhead deck.

Discussions on valve arrangement

7 Valve arrangements shown in Fig.1 to Fig.3, above, have been accepted under current SOLAS. The use of a short penetration piece was, and still is, considered as the only practical way of achieving compliance with the requirement that the "valve chest shall be secured at the bulkhead inside the forepeak".

8 It is clear that there is no room under the provisions of regulation II-1/12.5.1 of the amended SOLAS to permit the valve arrangement shown in Fig.2 for minimizing opening in the collision bulkheads.

9 On the other hand, valve arrangement secured to the bulkhead structures by short penetration pieces as shown in Fig.3 as well as that shown in Fig.1 are considered to provide an acceptable arrangement and should be acceptable under SOLAS regulation II-1/12.5.1 as amended by resolution MSC.194(80).

Action requested of the Sub-Committee

10 The Sub-Committee is invited to consider the issues discussed in this document and, in its ongoing work on the development of explanatory notes for the harmonized SOLAS chapter II-1, provide clarity on these issues taking into account, in particular, the proposals in paragraphs 6 and 9 above.
