BULK CARRIER SAFETY

Comments on the International Collaborative FSA Study Final Report and a Review of Proposals

Submitted by the United Kingdom

SUMMARY

Executive summary: This paper provides comment by the United Kingdom on the proposals to address the safety of bulk carriers presented to the Committee for action and is submitted in accordance with paragraph 46.5 of the Guidelines on the organization and method of work. Furthermore, it provides a focus for action to improve the safety of bulk carriers.

Action to be taken: Paragraph 28

Related documents: MSC 74/5/4, MSC 74/5/5, MSC 74/INF.14, MSC 74/INF.15, MSC 75/5/2, MSC 75/5/5, MSC 75/INF.19, MSC 76/INF.10, MSC 76/INF.11, MSC 76/INF.12, MSC 76/5/8, MSC 76/12/2

Introduction

1 The United Kingdom has taken the role as Co-ordinator of the International Collaborative FSA of Bulk Carriers and has submitted the final report of the project (MSC 76/5/5). The project's findings overall are those following the decision-making guidance kindly provided by the International Project Steering Board (IPSB), of which the United Kingdom has been an active member.

2 However, at this session, the Committee will consider recommendations to address the safety of bulk carriers as reflected by a number of submissions reporting on the application of the Formal Safety Assessment methodology to this ship type, or specific issues related to their design and operation. These are as follows:

1. Fore-end watertight integrity, submitted by IACS (MSC 74/5/4);
2. Life-Saving Appliances for Bulk Carriers FSA/LSA/BC, submitted by Norway/ICFTU (MSC 74/5/5);
3. A trial application of FSA methodology to No. 1 cargo hold flooding of bulk carriers, submitted by the Republic of Korea (MSC 74/INF.14);
4. A trial Application of FSA Methodology to the Hatchway Watertight Integrity of Bulk Carriers, submitted by the Republic of Korea (MSC 74/INF.15);
5. Report on FSA Study on Bulk Carrier Safety, submitted by Japan (MSC 75/5/2); and
3 At its seventy-fifth session the Committee approved the preliminary listed recommendations for decision-making produced by the Bulk Carrier Working Group, corresponding to the headings in tables 1 (new ships) and 2 (existing ships) of MSC 75/WP.19, annex 2.

4 In principle, the United Kingdom supports the adoption of all Risk Control Options (RCOs) found to be cost effective by the International Collaborative FSA Study. The United Kingdom also supports those specified in tables 1 and 2 of MSC 75/WP.19 annex 2. The number of proposed RCOs is significant, reflecting the reality that reducing risk for bulk carriers involves change in a number of areas. However, in our view, it is essential that the most significant risks to bulk carriers are addressed as a matter of urgency, and without discrimination of vessel age, i.e., a policy of implementation should be applied for existing ships for RCOs unless it is clearly impracticable.

5 Furthermore, if the full benefits of these RCOs are to be realised, care must be taken to ensure that the new text of relevant instruments to implement the RCOs remains consistent with fulfilling the original purpose, or function, of the RCO.

6 This paper outlines the United Kingdom's standpoint on the prioritisation of RCO implementation.

Results of studies

7 Although the FSA studies referenced herein apply somewhat different approaches, and assumptions, the United Kingdom believes that all draw similar conclusions. That is, in terms of fundamental risk, side shell plating failure is most significant. Hatch cover failure is also a significant risk and the importance of the ship/terminal interface should not be underestimated. We welcome the work by IBTA and specifically the Dry Bulk Terminals Contact Group who are working to improve the communication and understanding between the various stakeholders involved in the bulk shipping industry. This is an area in which future work is also needed.

8 However, the studies differ in relation to the balance of importance, in terms of risk, between hull construction and cargo hatchways. This is notably between the International Collaborative FSA Study (MSC 76/5/5) and Japan (MSC 75/5/2). Furthermore, the measures needed to address the risk differ, i.e. the International Study recommends increased strength whereas the study by Japan recommends the risk is addressed by operational issues.

9 The Committee is congratulated on work already undertaken to address bulk carrier safety and the recent amendments to SOLAS chapters VI and XII are welcomed. However, the United Kingdom believes the FSA studies all confirm the need for further amendments in light of their findings.

Proposed RCOs for implementation by IMO

10 While the UK believes that all the RCOs should be implemented, we propose the following should be implemented by IMO as a priority.

Double side skin

11 Of prime importance is the provision of double side skin, which should be mandated for new ships, recognising that it may not be cost-effective or appropriate for application to existing ships. The purpose of mandating double side skin is to improve the structural performance of hull construction and to reduce the influence of degradation through normal trading which often results in premature shell plating failure, and to provide a secondary barrier if this still occurred.

12 However, the double side skin does not mitigate the risk of escalating flooding arising from a collision event penetrating the double skin, or from flooding via hatch covers possibly initiated by loss of buoyancy forward. This is a risk normally managed on all ships by subdivision and, ultimately, life-saving appliances.
The provision of a single or double side skin has no impact upon the standard of subdivision addressed through ILLC and SOLAS. The provision of double side skin to a bulk carrier provides no justification for equivalence to SOLAS chapter XII. The United Kingdom believes that regulation 5 of SOLAS chapter XII, which calls for minimum structural standards for double bottoms and bulkheads, should apply to all bulk carriers, irrespective of whether single or double hull construction. This would fulfill the principle established by the Load Line Convention, namely that the general structural strength of the hull is sufficient for the draught corresponding to the freeboard assigned.

Furthermore, there is no evidence from the International Study to suggest that initiation of hull (side-shell) failure is any more prevalent at the fore-end than in any other sector of the hull.

Therefore, regulation 6 of SOLAS chapter XII (which calls for the structural strength of hold 1 to be able to withstand flooding) should be amended for existing ships to require that they are able to withstand flooding of any one cargo hold. This should apply in all loading and ballast conditions and if these structural strength requirements cannot be met then the cargo density should be limited on such vessels as outlined in the UK paper on transverse bulkheads (MSC 76/5/8).

Recognizing that implementation of a double hull on existing vessels may not be appropriate, the United Kingdom believes that existing ships need to be protected from the risk of side shell failure by alternative means.

Therefore, the United Kingdom subsequently recommends that either horizontal stringers or additional frames be inserted into existing vessels, to reduce local stress and improve fatigue life of the side shell. Whatever the cause, (fatigue or localised wastage of welds or frames) reducing the stress will provide risk benefit.

**Hatch cover strength and securing**

The United Kingdom has submitted a number of papers (MSC 76/INF.10, MSC 76/INF.11 and MSC 76/INF.12), detailing the model testing and analysis of green sea loading on hatch covers. The tests were conducted in accordance with best practice, in state of the art facilities and were overseen by the United Kingdom Maritime & Coastguard Agency and IACS. The strength of hatch covers in respect to the vertical loads clearly needs improving to the standards proposed by the United Kingdom in MSC 76/12/2. The model tests also identified that horizontal loads exceed design standards and a requirement for horizontal design loads is incorporated in the current revision of the Load Line Convention. These amendments to the Load Line Convention will address new ships, but it is essential to improve hatch cover securing mechanisms on both new and existing ships.

Therefore, the UK recommends that hatch cover load standards be implemented as proposed by MSC 76/12/2 as well as improvement of hatchcover securing standards.

**Free-fall lifeboats**

The casualty cases reviewed by the team working on data for the International Collaborative FSA project underlined the need for seafarers to abandon a bulk carrier quickly once evidence of hold flooding is established. The evidence suggests that current methods of abandonment provide difficulties, especially in heavy weather, but possibly because abandonment has been delayed too long.

Therefore, to mitigate this the United Kingdom supports the Norway/ICFTU proposal to introduce free-fall lifeboats to all (new and existing) bulk carriers. However, their minimum specification needs revision to account for testing/recovery and the ability to float free from a sinking vessel.

Notwithstanding the above paragraph, the United Kingdom proposes an MSC circular be developed to warn owners and seafarers of the need for early abandonment and to stand by a bulk carrier that has any single hold flooded. In the case of the Kamikawa Maru, it is clear that an early decision by the master to remove unessential crew members improved matters considerably. Regrettably, the master and other key crew members did not evacuate at the same stage.
23 The effectiveness of a free-fall lifeboat is dependent on the implementation of the decision already taken by the Committee to introduce water ingress alarms to all bulk carriers. These are needed to provide a vital early warning.

**Bulk Carrier Endorsement**

24 There is an urgent need to improve the training of seafarers sailing on bulk carriers, especially in relation to the understanding of loading stresses on bulk carriers, the importance of securing of hatch covers and the dangers of flooding. This training should develop the expertise on board to recognise serious hull defects and appreciate the importance of maintenance, coatings and repair work.

25 Therefore, we recommend a Bulk Carrier Endorsement to provide the specialist knowledge needed to operate this type of vessel.

**Proposed RCOs to be implemented by IACS**

26 The improvements tabled by IACS to improve fore-end fitting watertight integrity and their protection from mounting seas are welcomed. The International Study also identified the need for protection of fore-end fittings.

27 The existing fleet of bulk carriers is likely to suffer an ongoing incidence of shell plating failure. The introduction of Enhanced or risk-based ESP is a first step and is supported by the International Study. We further welcome moves by IACS to implement requirements for the strength of side shell frames of existing vessels and believe that a requirement for steel coating standards would further enhance bulk carrier safety.

**Action requested of the Committee**

28 The Committee is urged as a minimum to approve and introduce the risk control measures described above by the following actions:

1. Mandate double side skin for new bulk carriers.
2. Mandate regulation 5 of SOLAS chapter XII for all bulk carriers, irrespective of whether single or double hull construction.
3. Amend regulation 6 of SOLAS chapter XII such that existing ships are capable of withstanding flooding of any one cargo hold in all loading and ballast conditions or restrict the cargo density on such vessels.
4. Endorse the United Kingdom proposal for amendments to hatch cover strength requirements in the revision of the Load Line Convention as proposed in MSC 76/12/2.
5. Endorse a review of hatch cover securing mechanisms.
6. Mandate the fitting of free-fall lifeboats to all (new and existing) bulk carriers.
7. Endorse the proposal that an MSC circular be developed to warn owners and seafarers of the need for early abandonment of a bulk carrier that has any single hold flooded.
8. Endorse the proposal for a Bulk Carrier Endorsement to provide the specialist knowledge needed to operate this type of vessel.