中船重工船舶设计研究中心有限公司
China Ship Design & Research Center Co., Ltd.

Introduce on tests of tanks and tight boundaries

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1. Background

- Chapter II-1 Regulation 11 of SOLAS entered into force on Jan. 2009. This results in current shipbuilding practice (IACS's URS14) not in accordance with Chapter II-1Regulation 11 of SOLAS.

- This make some ships of IACS members be regarded as not to comply with the requirement of SOLAS at EMSA's inspection.

- So IACS and shipbuilding industry try to find the solution on tests of tanks and tight boundaries.

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2. The requirements of SOLAS Convention

Chapter II-1 Regulation 11

1. Testing watertight spaces not intended to hold liquids and cargo holds intended to hold ballast by filling them with water is not compulsory. When testing by filling with water is not carried out, a hose test shall be carried out where practicable. This test shall be carried out in the most advanced stage of the fitting out of the ship. Where a hose test is not practicable because of possible damage to machinery, electrical equipment insulation or outfitting items, it may be replaced by a careful visual examination of welded connections, supported where deemed necessary by means such as a dye penetrant test or an ultrasonic leak test or an equivalent test. In any case a thorough inspection of the watertight bulkheads shall be carried out.

2. The forepeak, double bottom (including duct keels) and inner skins shall be tested with water to a head corresponding to the requirements of regulation 10.1.

2. The requirements of SOLAS Convention

Chapter II-1 Regulation 11

3. Tanks which are intended to hold liquids, and which form part of the watertight subdivision of the ship, shall be tested for tightness and structural strength with water to a head corresponding to its design pressure. The water head is in no case to be less than the top of the air pipes or to a level of 2.4 m above the top of the tank, whichever is the greater.

4. The tests referred to in paragraphs 2 and 3 are for the purpose of ensuring that the subdivision structural arrangements are watertight and are not to be regarded as a test of the fitness of any compartment for the storage of oil fuel or for other special purposes for which a test of a superior character may be required depending on the height to which the liquid has access in the tank or its connections.

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3. Current shipbuilding practice

IACS UR S14

Current shipbuilding practice is to use IACS UR S14.
Some main points:

- Structural tests are to be carried out for at least one tank of a group of tanks having structural similarity (i.e. same design conditions, alike structural configurations and same general workmanship as determined by the attending Surveyor) on each vessel provided all other tanks are tested for leaks by an air test.

- Where the structural adequacy of the tanks of a vessel were verified by the structural testing required in Table 1, subsequent vessels in the series (i.e., sister ships built from the same plans at the same shipyard) may be exempted from structural testing of .

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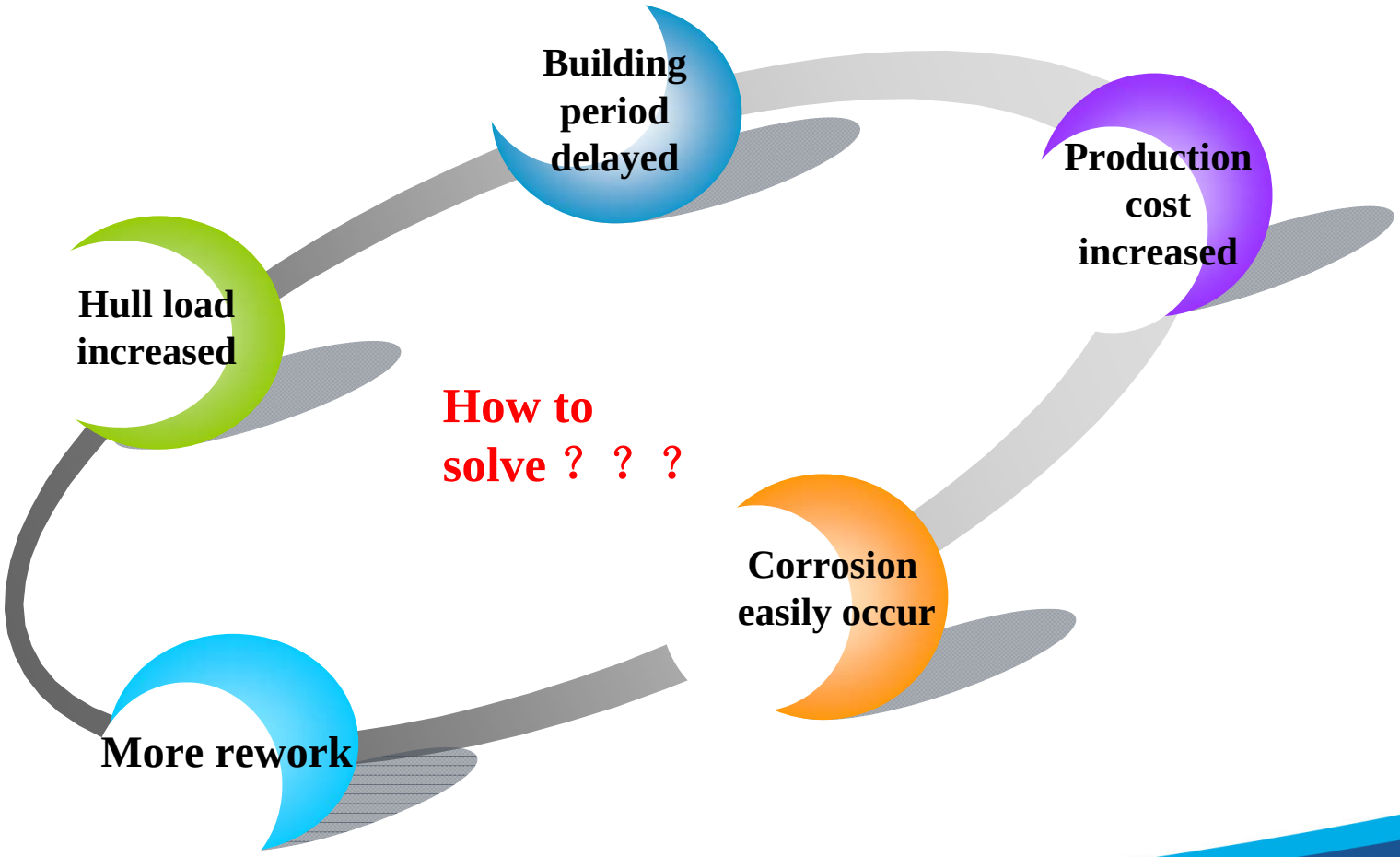
4. Some effects according to SOLAS



4. Some effects according to SOLAS

To use VLCC as a example:

- Building period to be delayed about one month
- If using fresh water, about 70 thousand tones to be consumed. Fresh water and other work shall cost more than one million RMB.
- If using sea water, work of washing tanks is very big. If works no good, corrosion shall easily occur, and so on.

In addition, many shipyards of China think that it ia not practicable for duct keel to carry out hydrostatic test.

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5. Some discussion on this problem

IACS

1. IACS:

- Based on UR S14, IACS proposed the draft amendments to SOLAS through jointing Cook Islands and Marshall Islands at MSC 86.

- MSC lets DE handling this problem.

- Under the support of shipbuilding industry, after DE56, IACS prepared the draft guidelines for “procedures of testing tanks and tight boundaries” so that proposed draft amendments to SOLAS.

5. Some discussion on this problem

Shipbuilding Indrustry

2. Shipbuilding Indrustry:

- Shipbuilding indrustry thinks SOLAS's requirement to be strict and affacts the development and progress of shipbuilding technology.
- According to long period use of UR S14, Shipbuilding indrustry thinks IACS UR S14 to be practicable.
- In order to support IACS UR S14 as the Draft guidelines for "procedures of testing tanks and tight boundaries" , after DE56, under coordinate of JWG, China, Japan , Korea and IACS prepared "Draft guidance on survey of the quality management systems on testing tanks and tight boundaries for shipyards"

5. Some discussion on this problem

Owner Organization

3. Owner Organization：

- INTERTANKO and INTERCARGO etc. do not agree to make admendments to SOLAS.

- But after DE56, INTERTANKO and INTERCARGO etc. joined JWG and agreed to discuss this problem.

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6. Current progress

- Because of objection from some Europe countries, topic on tests of tanks and tight compartments can not be discussed at this year DE 57.
- But DE 57 agreed to establish an informal JWG and continue to push this problem.
- On tripartite meeting last month, informal JWG had a meeting for “Draft guidance on survey of the quality management systems on testing tanks and tight boundaries for shipyards” and achieved some consensus.
- We strongly propose, topic on tests of tanks and tight compartments can be discussed on the meeting of SDC next year.

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Regarding solutions:

- “ The draft guidelines for “procedures of testing tanks and \ tight boundaries” ” plus “Draft guidance on survey of the quality management systems on testing tanks and tight boundaries for shipyards” as a whole is a good solution.
- Alternatively, if IACS can verify IACS UR S14 to be ok by FSA method etc., that shall be another good solution.
- In addition, in the investigation of China shipbuilding industry, China shipbuilding industry proposes it is necessary to do further explanation for SOLAS II-1/11 so that it can be further undersdtood.


Thank you for your attention !