The 5th Asian Shipbuilding Experts' Forum : Tank Testing of Watertight Compartments

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1. Background

1.1 SOLAS II-1/11 reads:

"the FPTs, DB and inner skins to be hydrostatically tested at least to a head of water up to the BHD deck,

tanks which holds liquids, and which form part of the watertight subdivision of the ship, to be hydrostatically tested for tightness and structural strength with water to a head corresponding to its design pressure.

The waterhead is in no case to be less than the top of the air pipes or to a level of 2.4m above the top of the tank, whichever is the greater.

1. Background

1.2 Practices

Well established and proven practices used for testing the integrity of watertight compartments intended to contain liquids are at variance.

1.3 IACS Proposal in 2009 (MSC 86/23/13)

Notwithstanding the provisions of para.2 and 3, the hydrostatic testing of a space or tank may be waived, provided that both the watertightness of all the boundaries of the space or tank is confirmed by appropriate testing, and the structural strength of such boundaries is ensured, i.a. appropriate standards approved by Adms, based on the Guidelines developed by IMO'.

1. Background

1.4 Guidelines

These Guidelines are based on the boundary testing requirements in the current edition of IACS UR S14.

These Guidelines have evolved over time in line with the evolution of modern shipbuilding technology primarily in the major shipbuilding nations: Japan, China, Korea as well as various shipyards in Europe and Americas.

Most flag Administrations have accepted the use of the Guidelines, pending IMO's consideration of the IACS' proposal (MSC 86/23/13), as an acceptable and equivalent alternative to the boundary testing of SOLAS II-1/11.

2. Issues to be addressed

2.1 A few, including Netherlands, Singapore and Norway, have not accepted the use of the Guidelines.

2.2 EU (EMSA) has advised IACS that it does not consider the Guidelines alone, to define an acceptable alternative, stating that :

- The IACS proposal refers to the guidelines, to establish a basis for waiver of the hydrostatic testing. It might be appropriate when the shipyard operates an effective quality system…

2. Issues to be addressed

2.3 If the proposal in MSC 86/26/13 is not adopted by IMO, the boundary testing for new ship construction will have to be done in strict accordance with SOLAS II-1/11 as written.

2.4 This would require very significant changes in the shipyard construction practice, as each watertight compartment would be require to be hydro-tested.

3. Revision of IACS Guideline

3.1 Draft Guideline for Procedures of Testing Tanks and Tight Boundaries

Item	After revision	Remark
4.2.2.2	Structural tests are to be carried out for at least one tank of a group of tanks having structural similarity …omitted…	Revised
4.2.2.5	For sister ships built two years or more after the last ship of a series, an exemption from structural testing may be considered…omitted…	Newly added
4.2.2.6	For the watertight boundaries of spaces other than tanks (excluding ballast holds and chain lockers), structural testing may be exempted…omitted…	Revised

3. Revision of IACS Guideline

Item	After revision	Remark
4.4.1/ 4.4.2	All external surfaces of the tested space are to be examined for structural distortion…omitted…	Newly added
4.4.4	A double inspection is to be made of tested welds. The first is to be immediately upon applying the leak indication solution; the second is to be after approximately four or five minutes in order to detect those smaller leaks which may take time to appear.	Newly added

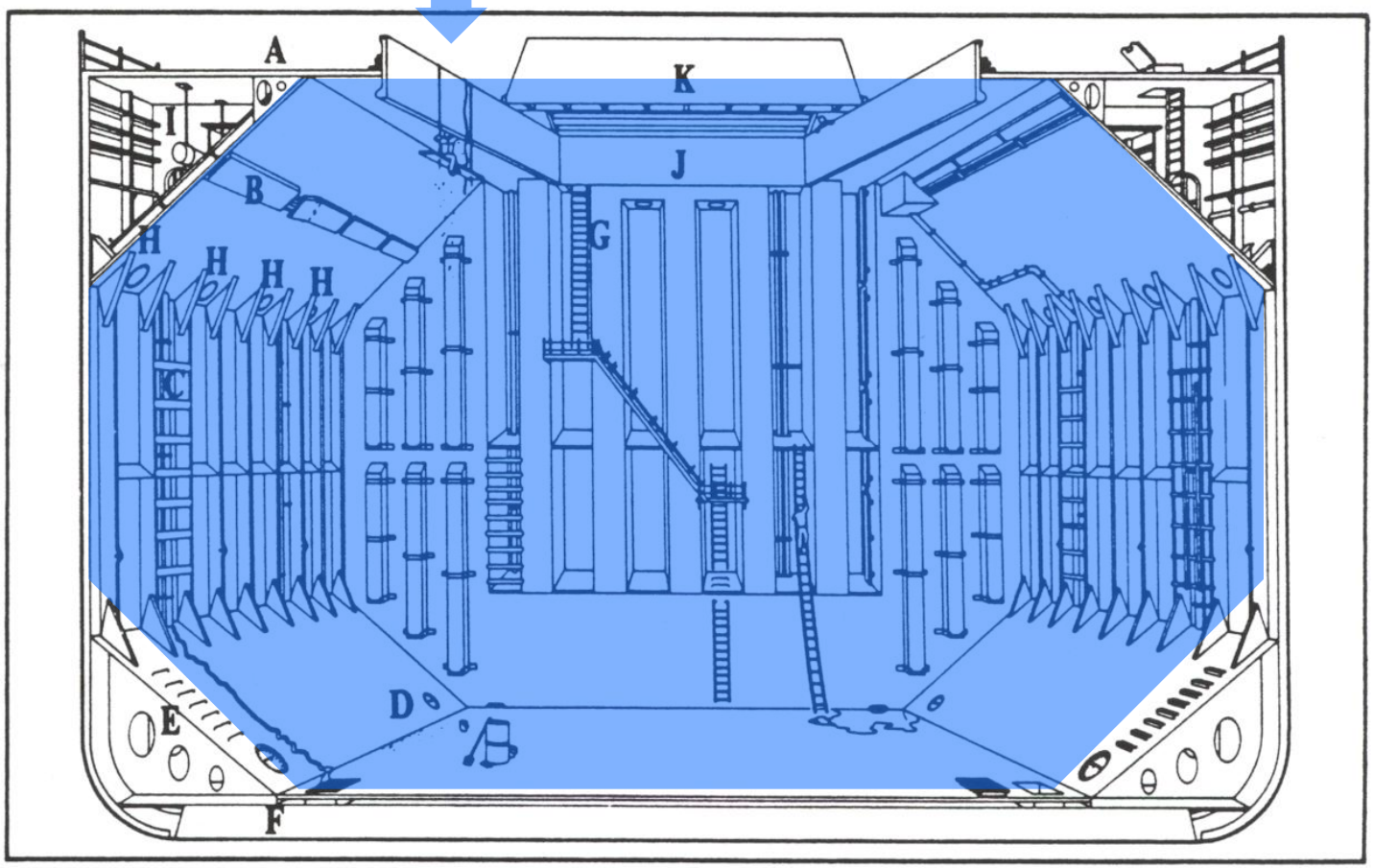
3. Revision of IACS Guideline

3.1.3 Table 3, Application of leak test, coating and provision of safe access for type of welded joints

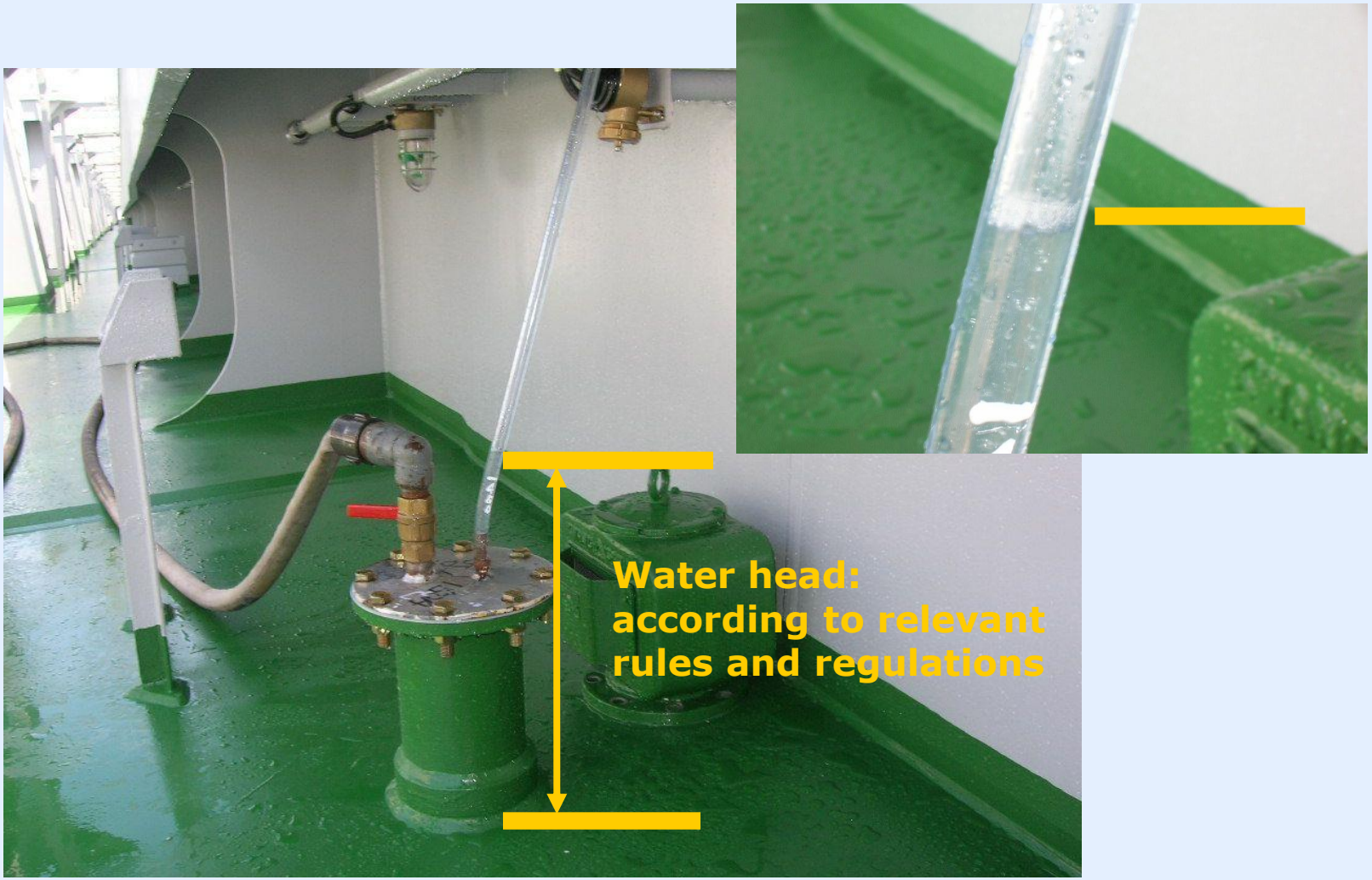
Item	After revision	Remark
Table3 Note 3	For Butt welding joint (Automatic), Coating before leak test is allowed at the following condition welds have been carefully inspected visually to the satisfaction of the Surveyor.	Newly added
Table3 Note 4	For Butt welding joint (Manual or Semi-automatic) Flux Core Arc Welding (FCAW) semiautomatic butt welds need not be tested provided that …omitted…	Newly added

4. Practice

1. Fill the water up to the required water head*
2. Check deformation etc of the Tank boundary.



4. Practice



4. Practice

▣ Watertight test history per each ship type

KOSHIPA – Sub-Committee of Quality Assurance

(10 Years' Reporting period: 2011-2010) 2011.09.24

Yards	B/C	CNTR	COT	FERRY	RO-RO	PC	LNG /LPG	A/C	C/L	CON -RO	OHG CC	Total	Remark
A		196	151			14	63					424	* During the reporting period, no deficiency etc w.r.t. tank strength tests was reported.
B	31	88	377	1	6	34	15	2	4	5	4	567	* During the reporting period, no deficiency etc w.r.t. tank strength tests was reported.
C	47	335	190			66	100					738	* During the reporting period, no deficiency etc w.r.t. tank strength tests was reported.
Total	78	619	718	1	6	114	178	2	4	5	4	1,729	

* A/C = ASPHALT CARRIER
* C/L = CABLE LAYER
* OHGCC = OPEN HATCH GENERAL CARGO CARRIEROPEN HATCH GENERAL CARGO CARRIER

5. Recommendation

The following course of action is recommended for consideration by ASEF:

4.1 ASEF is invited to take note of the information, and share the need to accept the Guidelines as an acceptable alternative to the boundary testing specified in SOLAS II-1/11.

4.2 Bring this matter to the attention of flag Administrations by means of a submission to IMO.

5. Recommendation

4.3 Such a submission would call for the ‘alternative’ proposed in MSC 86/23/13 to be accepted, provided that the shipyard implements a quality management system not less effective than ISO 9000, or an equivalent quality management system, acceptable to the Administration.

END

Thank you for your attention.

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