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TECHNICAL INFORMATION

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Amendments of Regulations Related to LNG Fuel Tank Suction Well in IGF Code

The provided technical information pertains to the amendment to the requirements allowing the installation of the suction well protruding below the double bottom of ships subject to the application of the IGF Code, as discussed in the 9th session of the IMO's Sub-Committee on Carriage of Cargo and Containers (CCC).

1. General Information

Due to the expanded application of the IGF Code and technological advancements, there has been an increasing trend in the installation of LNG membrane fuel tanks below the open deck on ships since January 2017 and plans are underway for the arrangement of such tanks in the future. These designs necessitate a suction well for the fuel pump to maximize the utilization of LNG fuel in the fuel tanks located below the open deck. However, the absence of regulations permitting suction wells in the current IGF Code poses challenges to both the efficient operation of ships and the safe design of such installations.

그림 1: Type B fuel tanks arranged under open deck

2. Requirements Regarding the Allowable Depth of the Suction Well Protruding the Double Bottom in Relation to the IGF Code

1) The criteria in convention for the allowable depth of the suction well protruding below the double bottom as follows:

	Item	Par.	Contents
SOLAS	Double bottom	II-1/9.2	A double bottom will be deemed satisfactory if the inner bottom is not lower at any part than a plane parallel with the keel line and which is located not less than a vertical distance h measured from the keel line, as calculated by the formula: h = B/20 (However, in no case is the value of h to be less than 760 mm, and need not be taken as more than 2,000 mm)
	Small Well	II-1/9.3.1	The vertical distance from the bottom of small well to a plane coinciding with the keel line shall not be less than h/2 or 500 mm, whichever is greater
IGC	Double bottom	2.4.1.2 & 2.4.1.3	Cargo tanks shall be located at the following distances inboard: - Types 2G/2PG : from the moulded line of the bottom shell at centreline not less than the vertical extent of damage specified in 2.3.1.2.3 and nowhere less than "d" as indicated in 2.4.1.1.3 - Type 3G : from the moulded line of the bottom shell at centreline not less than the vertical extent of damage specified in 2.3.1.2.3 and nowhere less than "d", where "d" = 0.8 m from the moulded line of outer shell
	Suction Well	2.4.3	Suction wells installed in cargo tanks may protrude into the vertical extent of bottom damage specified in 2.3.1.2.3, provided that such wells are as small as practicable and the protrusion below the inner bottom plating does not exceed 25% of the depth of the double bottom or 350 mm, whichever is less.
IGF	Double bottom	Part A-1 5.3.3.5	The lowermost boundary of the fuel tank(s) shall be located above the minimum distance of B/15 or 2.0 m, whichever is less, measured from the moulded line of the bottom shell plating at the centreline.
	Suction Well	-	**Not specified**

<**Table 1**: Criteria for Allowable Depth of Suction Well protruding below Double Bottom of ship>

2) The IGF Code does not specify solid regulations regarding the suction well of LNG fuel tanks. When applying Regulation 9 of SOLAS II-1, **if the suction well excessively protrudes below the double bottom and encounters an impact on the ship's underwater hull, it may compromise safety by failing to protect the fuel tank.** In particular, the leakage of low-temperature liquid in the event of fuel tank destruction poses a significant threat to the safety of the vessel due to brittle fracture of the hull.

3) Conversely, **not installing a suction well in the fuel tank may lead to a significant amount of unusable fuel.** This raises concerns about hindering the efficient arrangement of fuel tanks and the effective operation of the vessel.

4) On the other hand, for LNG cargo tanks with larger sizes and a greater number of pumps compared to LNG fuel tanks, there are regulations related to suction wells protruding below the double bottom, and these are permitted.

5) Therefore, for the reasons mentioned above, it is necessary to clarify the regulations on suction wells in the IGF Code.

3. Outcome of IMO 9th Session of the Sub-Committee on Carriage of Cargo and Containers

1) The characteristics of LNG as fuel or cargo are identical, and the associated risks related to the depth of suction well in fuel tanks protruding below the double bottom of ships are equivalent to those in cargo tanks. Additionally, LNG fuel tanks have smaller sizes, smaller suction openings, and fewer in number compared to cargo tanks. Taking these into consideration, it has been agreed to revise the relevant regulation in the IGF Code to align with the IGC Code.

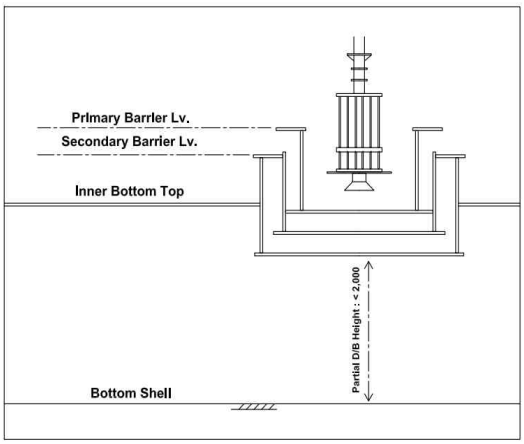

Figure 2: Suction Well of LNG Cargo or Fuel Tank

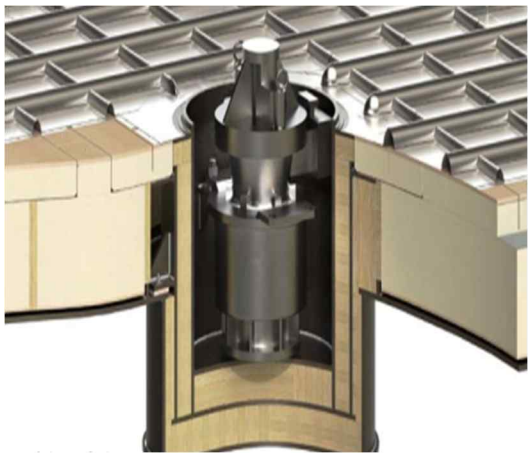

Figure 3: Suction Well of LNG Cargo or Fuel Tank

2) If the IGF Code amendments approved during the 9th session of CCC are adopted in MSC 108[1)] and subsequently accepted in MSC 109[2)], they are scheduled to be applicable to all ships with the application of IGF after January 1, 2028.

3) The content regarding the protection distance for the suction well of LNG fuel tanks protruding the double bottom within Part A-1 5.3.3.5 of the IGF Code is expected to be reflected as follows:

> "5.3.3.5.1 For vessels with suction wells installed in fuel tanks, the bottom of the suction well may protrude into the vertical extent of the minimum distance specified in 5.3.3.5, provided that such wells are as small as practicable and the protrusion below the inner bottom plating does not exceed 25% of the depth of the double bottom or 350 mm, whichever is less."

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1) MSC 108 is scheduled to take place around May 2024.

2) MSC 109 is scheduled to take place around December 2024.

4. KR's Actions

Considering the intent of these amendments, this classification society plans to take the following measures, anticipating that the swift implementation of the amended regulations can promote the safe design and efficient operation of ships:

1) Early implementation of the regulation before the adoption of MSC 109[3)]
2) Incorporating suction well requirements into the guidelines for Low Flashpoint Fuel Ship Rules applicable to ships under construction contracts after July 1, 2024.
3) making additional amendments by Elevating the requirements in the guidelines to in class rule in alignment with the approval and effective date of MSC 108.

This technical information has been made by the Convention & Legislation Service Team (convention@krs.co.kr) to provide information regarding the allowance of suction wells in the IGF Code.

For inquiries related to classification rules, please contact Hull Rule Development Team (hullrule@krs.co.kr.)

Source: Figure 1, 2 (HD Hyundai Heavy Industries), Figure 3 (GTT Inside, GTT)
(Distributions: KR surveyors, Ship owners, Manufacturers, Other relevant parties)

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3) However, if there are specific guidelines by flag state, the guidelines of the flag state take precedence.