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**UNIFIED INTERPRETATION OF PROVISIONS OF IMO SAFETY, SECURITY, AND  
ENVIRONMENT-RELATED CONVENTIONS**

**Ventilation of cofferdam spaces between cargo tanks in membrane gas carriers**

**Submitted by IACS**

**SUMMARY**

*Executive summary:* This document seeks the views of the Sub-Committee on the ventilation requirements for cofferdams surrounding the cargo tanks on membrane type gas carriers

*Strategic direction, if applicable:* 6

*Output:* 6.1

*Action to be taken:* Paragraph 11

*Related documents:* BLG 15/10 and BLG 15/INF.2

**Background**

1 Paragraph 12.2 of the IGC Code, as amended by resolution MSC.370(93) (the revised IGC Code) states:

**"12.2 Spaces not normally entered**

12.2.1 Enclosed spaces where cargo vapours may accumulate shall be capable of being ventilated to ensure a safe environment when entry into them is necessary. This shall be capable of being achieved without the need for prior entry.

12.2.2 For permanent installations, the capacity of 8 air changes per hour shall be provided and for portable systems, the capacity of 16 air changes per hour.

12.2.3 Fans or blowers shall be clear of personnel access openings, and shall comply with 12.1.7."

2 The corresponding paragraph of the IGC Code in force before the changes introduced by resolution MSC.370(93) states:

"12.2 Spaces not normally entered

Hold spaces, interbarrier spaces, void spaces, cofferdams, spaces containing cargo piping and other spaces where cargo vapours may accumulate, should be capable of being ventilated to ensure a safe environment when entry into the spaces is necessary. Where a permanent ventilation system is not provided for such spaces, approved means of portable mechanical ventilation should be provided. Where necessary owing to the arrangement of spaces, such as hold spaces and interbarrier spaces, essential ducting for such ventilation should be permanently installed. Fans or blowers should be clear of personnel access openings, and should comply with 12.1.9."

3 According to the version of the IGC Code in force prior to resolution MSC.370(93), the cofferdams are clearly identified as spaces that require ventilation, but no ventilation rate is specified. However, paragraph 12.2 of the revised IGC Code does not list (identify) spaces that require ventilation, but the ventilation rate is specified. This results in very large ventilators and is unfeasible for cargo tank cofferdam spaces, noting their large volume.

4 The explanation provided in the annex to document BLG 15/10 for the change simply states:

"Update SOLAS reference, for spaces required to be entered during normal cargo operations the requirements of IEC 60092 have been incorporated, requirements for vent fans and spares outfits increased and minimum number of air changes provided for fixed and portable ventilation equipment for spaces not normally entered specified."

## **Discussion**

5 On the basis of a "single failure" the cofferdams would not be expected to come into contact with the cargo and would, therefore, not be enclosed spaces where cargo vapour can accumulate. However, as cofferdams are considered in the revised IGC Code to be hazardous areas (paragraph 1.2.24.13), it is logical that cargo vapour will be expected in them. Additionally, cofferdams are taking their air from hazardous areas; consequently, it could reasonably be assumed that there will be cargo vapour in them.

6 Strict application of the requirements of the revised IGC Code therefore requires cargo tank cofferdams to have a ventilation system capable of eight air changes per hour (16 air changes per hour for portable systems). However, this capacity requirement is not a practical value considering the very large volume of cofferdams. As the aim of this requirement is to address the safe entry into the space (i.e. atmosphere preparation/conditioning prior to entry), and not the dilution of possible gas; IACS struggles to see the technical justification for the ventilation requirement as prescribed in the revised IGC Code with respect to cargo tank cofferdams.

7 IACS has considered whether the phrase "where cargo vapours may accumulate" in paragraph 12.2.1 of the revised IGC Code applies to cargo tank cofferdams of membrane gas tankers or not. In this regard, IACS does not consider that cargo vapours will accumulate in the cofferdams of membrane type cargo tanks considering that:

- .1 cargo vapour ingress through the ship structure from the cargo containment system is already prevented by the two barriers (primary and secondary) in the design of the cargo containment system;
- .2 cargo vapour ingress from deck areas through the air vent head would be negligible since gas vapour would not travel through the air vent head closing devices;
- .3 both the primary and secondary insulation spaces are required to be inerted (nitrogen purge) with separate systems;
- .4 separate gas detection systems are required in the insulation spaces and arranged to alarm in the event of leak in the primary or secondary barrier; and
- .5 low temperature and high pressure alarms will indicate failure of the primary barrier.

8 The only event which could result in a head of liquid cargo on the tank side of a transverse bulkhead is total loss of both primary and secondary containment. This is a catastrophic event as the transverse bulkhead material is not required to be designed for the resulting temperature and would likely fail. Such an event would certainly not lead to entering the cofferdam for any purpose.

9 IACS considers that the ventilation requirement of 8/16 air changes per hour is overly onerous and should be reviewed for cargo tank cofferdams.

10 On a related issue, IACS finds that the description of "permanent installations" and "portable systems" in paragraph 12.2.2 of the revised IGC Code is not clear. Though it may be expected to interpret "permanent" as meaning "fixed fan with fixed duct system", the effectiveness of the ventilation system does not really depend on whether the fan is "fixed" or "portable"; although the duct construction (fixed or flexible) does matter. IACS considers that it is reasonable to interpret "permanent installation" as meaning a "fixed duct system in the compartment being ventilated" regardless of whether the fan is fixed or portable. If the Sub-Committee agrees that this needs clarification, IACS will prepare an appropriate unified interpretation.

#### **Action requested of the Sub-Committee**

11 The Sub-Committee is invited to consider the above issues and:

- .1 consider whether an amendment to the IGC Code is required to address the problems with ventilation of cargo tank cofferdam spaces or if this can be addressed by means of a unified interpretation;
- .2 decide on the definition of "permanent installation" and if IACS should prepare a draft unified interpretation on this issue; and
- .3 take action as appropriate.