

**No.
123**

(May
2012)

Recommendation based on IMO instruments - MSC.1/Circ.1370 “Guidelines for the design, construction and testing of fixed hydrocarbon gas detection systems” and Resolution MSC.292 (87) “Amendments to the FSS Code Chapter 16 Fixed Hydrocarbon Gas Detection Systems”

1. **Common lines from sampling points - Resolution MSC.292(87), FSS Code, Chapter 16, paragraphs 2.2.1.1 and 2.2.1.3 specify that:**

2.2.1.1 Common sampling lines to the detection equipment shall not be fitted, except the lines serving each pair of sampling points as required in paragraph 2.2.1.3.

2.2.1.3 The configuration of gas sampling lines shall be adapted to the design and size of each space. Except as provided in paragraphs 2.2.1.4 and 2.2.1.5, the sampling system shall allow for a minimum of two hydrocarbon gas sampling points, one located on the lower and one on the upper part where sampling is required. When required, the upper gas sampling point shall not be located lower than 1 m from the tank top. The position of the lower located gas sampling point shall be above the height of the girder of bottom shell plating but at least 0.5 m from the bottom of the tank and it shall be provided with means to be closed when clogged. In positioning the fixed sampling points, due regard should also be given to the density of vapours of the oil products intended to be transported and the dilution from space purging or ventilation.

1.1 Recommendation

It is noted that manufacturers recommend that single sampling lines are arranged from each sampling point to the detection cabinet. If combined, and unless each sampling line from each sampling point has an isolation valve arrangement, a common line would imply that the sampling rate from each point would be 70% for the top and 30% for the lower (due to pressure drop). This is not considered to give acceptable accuracy.

It is therefore preferable that single sampling lines from each sampling point to the gas detection cabinet are arranged.

It may however be accepted that each sampling line from each sampling point in the compartment being monitored is joined at deck level via a manually operated three-way valve arrangement. When the ship is in the loaded condition the three-way valve will be set so that the lower sampling point is active, and when in the ballast/partial ballast condition it will be set such that the top sampling point is active. This is in line with 2.2.1.5 (see below). With respect to 2.2.3.1 (which specifies that the gas detection equipment shall sample and analyse from each sampling line of each protected space, sequentially at intervals not exceeding 30 minutes) we do not interpret this to mean that both sampling points have to be active in all modes (i.e. in loaded condition and ballast/partial ballast condition). In terms of 2.2.1.6 (the system shall have an alarm to indicate clogging of gas sampling lines. Ref. also MSC.1/Circ.1370 3.2.1.3), we interpret this to be fulfilled as low flow or no flow will be detected when the relevant sampling line is active.

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Consequently, it is recommended that

- 1.1.1 the gas detection system should be arranged with single sampling lines from each sampling point to the gas detection cabinet; and
- 1.1.2 sampling lines from each sampling point in the same space may however be combined at deck level via a manually operated three-way valve arrangement. The valve should be provided with local indication of which sampling point is active (top or bottom). A signboard should be provided in the Cargo Control Room to specify the procedure for manual operation of valves depending on operational mode as follows:
 - In loaded condition: valve to be set so that lower sampling point is active.
 - In ballast/partial ballast condition: valve to be set so that upper sampling point is active.

2. Number of sampling points – Resolution MSC.292(87), FSS Code, Chapter 16, paragraph 2.2.1.5 specifies that:

2.2.1.5 For ballast tanks in the double-bottom, ballast tanks not intended to be partially filled and void spaces, the upper gas sampling point is not required.

2.1 Recommendation

It is noted that these provisions state that top and bottom sampling points as required in paragraph 2.2.1.3 need not be fitted in ballast tanks that are not intended to be partially filled and void spaces. In such spaces the top sampling point may be omitted.

In terms of ballast tanks, trim and stability manuals frequently include loading conditions involving partially filled ballast tanks. However, it is not considered feasible to implement this as an operational limitation for ships.

In order to avoid deviating interpretations related to the term "intended," top and bottom sampling points are required for all ballast tanks.

Consequently, it is recommended that:

- 2.1.1 For void spaces and other dry compartments such as ballast pump rooms, one bottom sampling detector is acceptable; and
- 2.1.2 For ballast tanks and freshwater tanks, top and bottom sampling points should be provided unless the prohibition of partial filling is clearly stated in the Trim and Stability Booklet/Loading Manual.

3. Adjacent tanks – Resolution MSC.291(87), SOLAS regulation II-2/4.5.7.3.1 states that:

5.7.3.1 In addition to the requirements in paragraphs 5.7.1 and 5.7.2, oil tankers of 20,000 tonnes deadweight and above, constructed on or after 1 January 2012, shall be provided with a fixed hydrocarbon gas detection system complying with the Fire Safety Systems Code for measuring hydrocarbon gas concentrations in all ballast tanks and void spaces of double-hull and double-bottom spaces adjacent to the cargo tanks, including the forepeak tank and any other tanks and spaces under the bulkhead deck adjacent to cargo tanks.

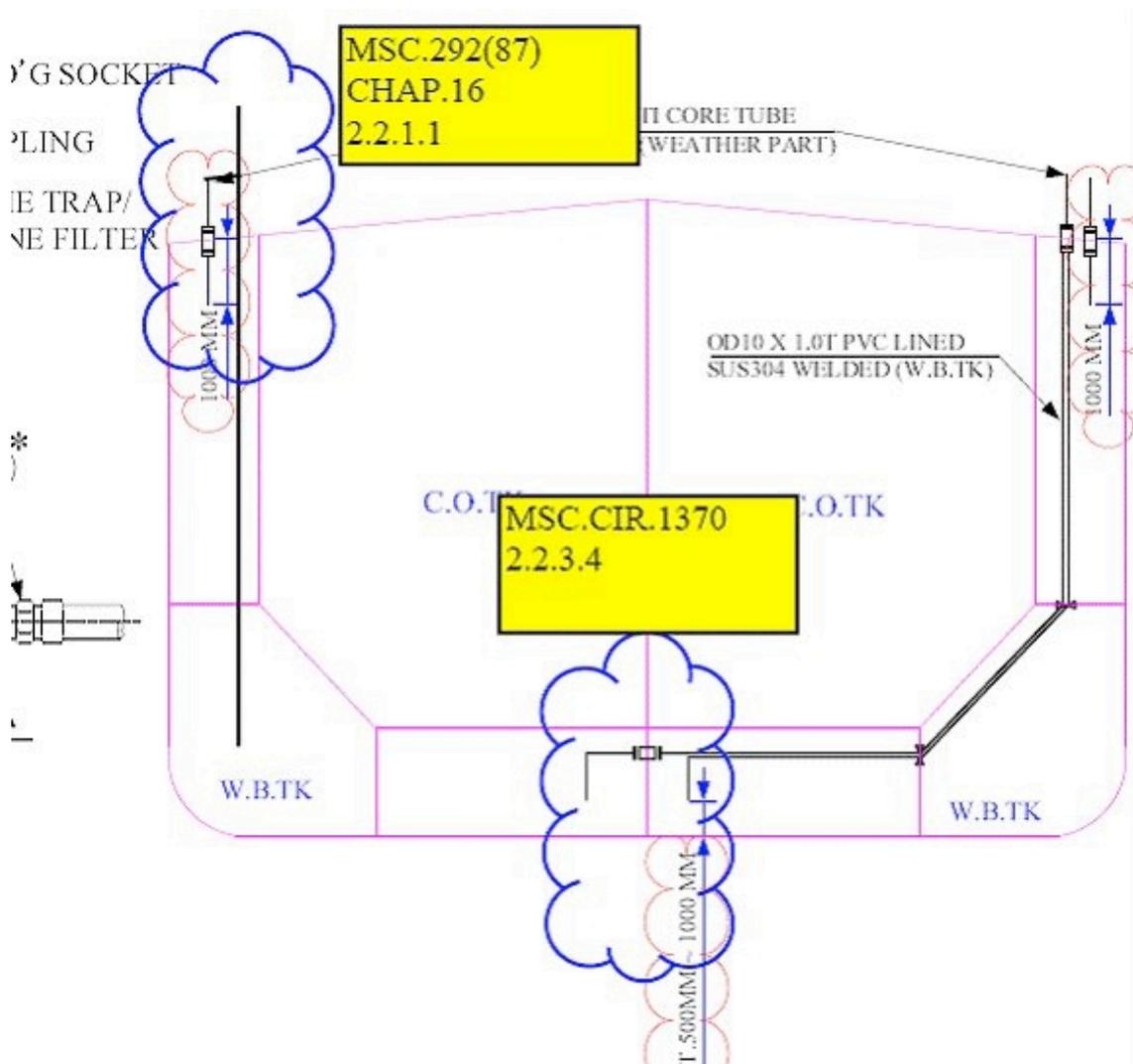
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3.1 Recommendation

Taking into account that it is assumed that the intention of the requirement is to cover ballast tanks and similar spaces, as well as void spaces and dry compartments; and that gas detection in fuel tanks is considered to be impracticable due to the nature of e.g. heated fuel oil vapour and potential for clogging of small gas sampling lines:

- 3.1.1 it is not recommended to apply these requirements to fuel tanks located adjacent to cargo tanks;
 - 3.1.2 it is recommended to apply these requirements to ballast pump rooms, bow thruster rooms etc. located under the bulkhead deck adjacent to cargo or slop tanks*; and
 - 3.1.3 it is recommended to apply these requirements to freshwater tanks located under the bulkhead deck adjacent to cargo or slop tanks*.
- *) excluding slop tanks used solely for the retention of oily water



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