

Petroleum and Petrochemical Bulletin

H₂S monitoring and measurement

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Rev. 0

IFIA member companies have noted some confusion around the use of H₂S readings taken on board marine vessels. This is an important issue as, in addition to safety concerns, measurements are used to influence cargo treatment processes.

Differences in H₂S readings and their application should be noted as follows:

1. Monitoring the working environment

IFIA member companies are committed to the health and safety of their employees and of those around them and follow appropriate regulations, recommendations and good practice. Inspectors are required to monitor H₂S concentrations within the working environment upon a vessel or a shore tank. Personal H₂S monitors are carried and usually clip to the inspectors clothing. Various designs are available and readings are normally taken in the breathing zone, close to the nose and mouth.

Readings are susceptible to atmospheric conditions, such as wind, etc., and available detector devices may also be sensitive to vapour interferences. However, the results are considered appropriate for monitoring personal safety.

Alarm limits are set to 5 or 10ppm depending on local regulations and if these levels are exceeded a risk assessment should be performed with work continuing only if H₂S concentration can be reduced or if safeguards indicated in the risk assessment are implemented.

2. Quantitative H₂S Measurement – Vapour space

Readings from personal monitors taken in the working environment near a hatch or vapour control valve are to monitor personal safety as discussed above and will not provide a reliable indication of the H₂S concentration within the vapour space in a tank. Further, these instruments will not provide reliable measurements if they are introduced into the tank vapour space as they can be affected by hydrocarbon rich, oxygen deficient, high humidity atmospheres, or a combination of these and other conditions.

H₂S concentration in tank vapour space may be determined using equipment and procedure as given in EI HM 69 *Procedures for determining H₂S concentration in cargo tank headspaces*. H₂S concentration may need to be determined as part of a risk assessment before opening a tank.

Revisions/Reaffirmations

Rev. 0 January 2017

3. Quantitative H₂S Measurement – Cargo

H₂S measurements are often used to predict the need for chemical treatment, and/or the amount of chemical treatment to be applied to a cargo.

It should be noted that the concentration of H₂S in the vapour space is not a reliable indication of the concentration of H₂S in the liquid cargo. IFIA member companies recommend (and note that cargo treatment providers normally require) that the data used to determine the need for and/or quantity of H₂S treatment is obtained from analysis of cargo samples using a recognised test method; e.g. ASTM D5705, ASTM D6021, ASTM D7621, IP 570.

Please also refer to IFIA Bulletins B12-02 (Bunker sampling for H₂S) and B16-04 (H₂S to ASTM D5705)

If an alternative procedure is proposed, the procedure, together with an appropriate risk evaluation, should be fully documented. Also, any measurement instrument used should be approved by the manufacturer for use in the atmospheric conditions expected in a cargo tank. The procedure should be fully understood and agreed between the parties prior to its use.

It is essential that critical H₂S measurements are obtained using techniques appropriate to their purpose and that all parties are aware of their roles and obligations in the production and use of these measurements.

When reporting vapour space H₂S measurements IFIA member companies are advised to use the following disclaimer:

Warning: Measurements of H₂S concentration in tank vapour spaces do not necessarily give an accurate representation of the H₂S content of the liquid cargo, which should be determined from samples using a recognised test method.

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