



LP Bulletin

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Bulletin 614 - 12/08 - Oxygen analysis and gas detection equipment - Worldwide

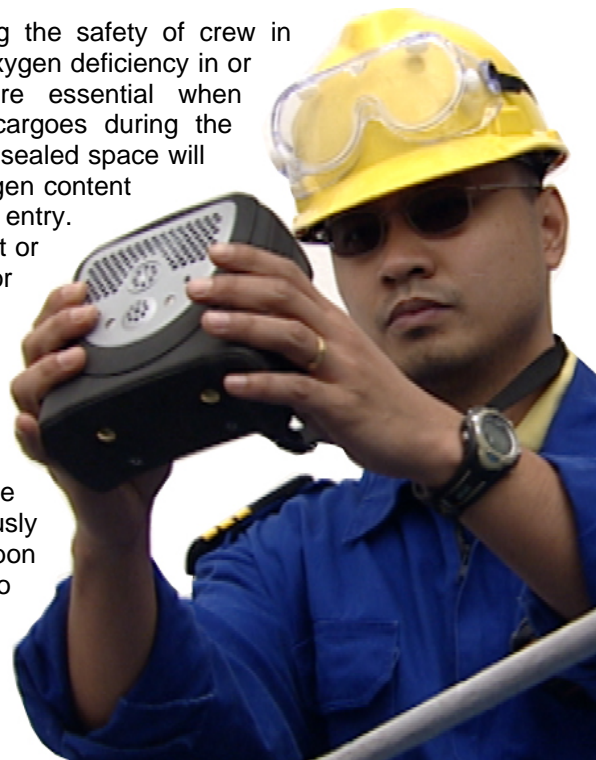
It has been found during several incidents this year that some bulk carriers are not equipped with oxygen analysis and gas detection equipment, or that it is not calibrated, not working or the crew do not know how to properly operate it.

Chapter VI of the International Convention for the Safety of Life At Sea (SOLAS) relates to the carriage of cargoes. Regulation 3 of the Chapter (Oxygen Analysis and Gas Detection Equipment) states:

1. When transporting a bulk cargo which is liable to emit a toxic or flammable gas, or cause oxygen depletion in the cargo space, an appropriate instrument for measuring the concentration of gas or oxygen in the air shall be provided together with detailed instructions for its use. Such an instrument shall be to the satisfaction of the Administration.
2. The Administration shall take steps to ensure that crews of ships are trained in the use of such instruments.

These instruments are essential for ensuring the safety of crew in respect of toxic gases in the atmosphere or oxygen deficiency in or near cargo spaces. Furthermore, they are essential when determining the behaviour of certain bulk cargoes during the voyage. Many bulk cargoes when carried in a sealed space will react with oxygen in the air; reducing the oxygen content to levels which will asphyxiate persons on entry. Oxygen deficiency cannot be detected by sight or smell, and measuring the oxygen content prior to entry is therefore essential.

The safe carriage of many cargoes depends upon atmosphere control in the hold space. Determination of hydrogen and oxygen levels is necessary for the safe carriage of D.R.I. cargoes. Coal cargoes may evolve a flammable gas (methane) or may heat spontaneously resulting in the evolution of the toxic gas carbon monoxide, and deplete oxygen in the hold to very low levels. In these cases, daily or twice-daily monitoring of the cargo spaces is essential to guide safe ventilation or sealing conditions.



Instruments to test for these gases are readily available, including many types that will measure for gases relevant for a specific cargo. However it is essential that crewmembers are trained in the use of the instruments and the instruments are regularly calibrated and serviced by makers or recognised agents.

In the past months there have been several incidents where ships have been found not provided with test instruments or crew unaware of how to operate them:

- **Carriage of a coal cargo**
In managing a cargo incident on board the crew were requested to draw samples from the hold spaces. It was found that some time ago the measuring device had been handed to the engine department, assuming they had a greater need for it. In the mean time the battery pack had corroded rendering the device useless at the time.
- **Instruments not fitted with suitable aspirating systems**
In managing a cargo incident the crew were requested to draw samples from the hold spaces. This was not possible with the equipment on board because the type of device was not fitted with a suitable aspirating system.
- **Carriage of a coal cargo**
The measuring device on board was not designed for measuring carbon monoxide and oxygen levels. The device could therefore not be used for monitoring conditions in the holds.
- **Hold atmosphere readings presented were not realistic**
In this case the chief officer was requested to check the instrument in accordance with the instruction manual. The chief officer stated this was not possible because the manual was printed in Japanese.

The provision of suitable instruments for testing the atmosphere in cargo holds and confined spaces is essential for the safe operation of bulk cargo vessels. Failure to provide such instruments is also be in breach of SOLAS Regulations. It should be noted that the suitability of an instrument depends upon the application. For example, many flammable gas detectors will not provide reliable measurements of methane and hydrogen when in low-oxygen atmospheres.

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