

Bulletin 436 - 10/05 - Incorrect Monitoring of Hold Atmosphere - Worldwide

A Member's ship recently experienced a fire in a coal cargo which was discovered on arrival at the discharge port. Records show that the oxygen and carbon monoxide levels as measured by the crew were at acceptable levels for the major part of the voyage. However, the investigation found that the atmosphere tests had been conducted outside the ventilator openings on the hatch covers and the readings therefore bore no relevance to the atmosphere in the holds.

The IMO Code of Safe Practice for Solid Bulk Cargoes specifies the siting of sampling points for the carriage of coal cargoes in Appendix G.2.2. These sampling points are essentially designed so that accurate measurements of the hold atmosphere can be determined with minimum disturbance to the atmosphere within the hold.

If the recommendations of the IMO Code of Safe Practice had been followed in the case mentioned above, the master and crew would have been alerted to the onset of spontaneous heating within the cargo. They could have advised the owners and sought expert advice. Cargo holds could then have been tightly sealed, with sealing tape if necessary, and with careful monitoring of the cargo spaces the ship could have proceeded to the destination port and further cargo heating avoided. The IMO Code of Safe Practice for Solid Bulk Cargoes clearly defines the requirements for the safe carriage of coal at sea, and includes the following:

General Requirements for all coals

- 1 Prior to loading the shipper or his appointed agent shall certify in writing to the master the characteristics of the cargo and the recommended safe handling procedures for loading and transport of the cargo. As a minimum, the cargo's contract specifications for moisture content, sulphur content and size should be stated, and especially whether the cargo may be liable to emit methane or self-heat.
- 2 The master should be satisfied that he has received such information prior to accepting the cargo. If the shipper has advised that the cargo is liable to emit methane or self-heat, the master should additionally refer to the "Special precautions".
- 3.9 The atmosphere in the space above the cargo in each cargo space should be regularly monitored for the presence of methane, oxygen and carbon monoxide. Records of these readings should be maintained. The frequency of the testing should depend upon the information provided by the shipper and the information obtained through the analysis of the atmosphere in the cargo space.
- 3.10 Unless expressly directed otherwise, all holds should be surface ventilated for the first 24 hours after departure from the loading port. During this period, one measurement should be taken from one sample point per hold. If after 24 hours the methane concentrations are at an acceptable low level, the ventilators should be closed. If not, they should remain open until acceptably low levels are obtained. In either event, measurements should be continued on a daily basis.

Self heating coals

- 2.2 If the cargo is liable to self-heat or analysis of the atmosphere in the cargo space indicates an increasing concentration of carbon monoxide, then the following additional precautions should be taken.
 - 2.2.1 The hatches should be closed immediately after completion of loading in each cargo space. The hatch covers can also be additionally sealed with a suitable sealing tape. Surface ventilation should be limited to the absolute minimum time necessary to remove methane which may have accumulated. Forced ventilation should not be used. On no account should air be directed into the body of the coal as air could promote self-heating.
 - 2.2.5 If the carbon monoxide level is increasing steadily, a potential self heating may be developing. The cargo space should be completely closed down and all ventilation ceased. The master should seek expert advice immediately. Water should not be used for cooling the material or fighting coal cargo fires at sea, but may be used for boundaries of the cargo space.