

No. 16 2013/2014 - Carriage of Coal Cargoes from Kalimantan, Indonesia

August 2013

Dear Sirs

Carriage of Coal Cargoes from Kalimantan, Indonesia

Background

Over the past few years there have been numerous incidents involving coal loaded from ports in Kalimantan province ranging from serious cases of self-heating to cargo fires.

Low rank (geologically immature) coal, such as loaded off Kalimantan, is particularly susceptible to self-heating and may spontaneously combust if loaded at a temperature in excess of 55°C. Shippers and local suppliers have sometimes delivered coal to vessels off Kalimantan at a temperature close to this figure. Coal awaiting shipment is often stored in barges close to the anchorage areas where it may be exposed to strong winds and rain. Such conditions may promote self-heating, and barges containing coal with a temperature exceeding 55°C have sometimes been encountered.

However, not all operators appear to be aware of the risks and some vessels have only identified the problems after the cargo has been loaded. Once on board it is not easy to remove the coal due to the lack of discharging facilities in the region.

IMSBC Code

The International Maritime Solid Bulk Cargoes Code contains a comprehensive entry regarding the carriage of coal. Although some of the requirements are summarised below, Members should refer to the IMSBC Code itself for full details and ensure that the provisions are strictly followed.

Cargo Declaration

Although there are many good shippers and mining operations in Kalimantan, it is reported that not all are providing adequate cargo declarations. Some of the declarations have been found to misrepresent the cargo by either stating that the cargo is Category A (a reference to the 1990 version of the Code of Safe Practice for Solid Bulk Cargoes meaning it does not self-heat or emit methane) whilst others provide no details on the self-heating or methane emitting properties of the coal.

SOLAS Chapter VI and the IMSBC Code state that the shipper should provide the master or his representative with appropriate information sufficiently in advance on the properties of the cargo and recommendations regarding its safe handling, stowage and carriage so that the necessary precautions can be taken. In particular, the IMSBC Code requires the shipper to provide, in writing, the moisture content, sulphur content and particle size of the cargo, and information on whether it is liable to self-heat or emit methane, or both. A "Form for Cargo Information for Solid Bulk Cargoes" may be used for this purpose, an example of which can be found in Section 4 of the IMSBC Code. The master should insist that

the shipper provides a cargo declaration that is consistent with the requirements of the IMSBC Code and should not load the cargo without it.

Loading and Carriage Precautions

In order to avoid problems of self-heating during the voyage and possibly while loading, the temperature of the cargo should be checked beforehand. Although not required by the IMSBC Code, an infra-red thermometer is an ideal tool for this task. Infra-red thermometers are relatively inexpensive and easily obtainable. The instrument may be used to “scan” the surface of the cargo prior to and during loading, allowing the master to be alerted if the temperature readings are found to be high. Vessels should also reject cargo exhibiting clear signs of self-heating such as barges containing smouldering coal.

Checking the temperature of the cargo aboard the barges is not an easy task, and it should be borne in mind that attempts to conceal hot coal by covering it with cooler cargo are not uncommon. It is therefore recommended that Members appoint a local surveyor to assist the master, instructing the surveyor to:

- Contact the shippers prior to the vessel's arrival to identify the location of the stockpiles or barges
- Check the accuracy and validity of the information shown on the Cargo Declaration
- Ensure that the arrangements on board are satisfactory and comply with IMSBC Code requirements including:
 - the provision of at least two gas sampling points per cargo space, one on each side
 - the availability of at least one multigas analyser capable of measuring methane, oxygen and carbon monoxide
 - the presence of a calibration certificate and an up to date service record for each multigas analyser
 - the means to test the pH value of cargo space bilge samples without entering the holds
 - the posting of signs prohibiting naked flames, smoking, hot work, chipping and activities that may create sparks
- Confirm that the vessel's multigas analyser(s) are working correctly and that the crew is familiar with their use
- Check the temperature of the coal presented for shipment to confirm that it is suitable for loading
- Reject barges containing coal with a temperature higher than 55°C or exhibiting any other signs of self-heating
- Oversee the placing of the temperature probes and checking that they work
- Report any attempts made by shippers or other parties to hinder the activities of the surveyor
- Ensure that non-working cargo holds are closed and sealed
- Ensure that working cargo holds are closed and sealed if a delay of more than one hour is anticipated
- Confirm that the surface of the cargo in each hold is trimmed reasonably level before sailing
- Close and seal each cargo hold immediately on completion
- Close and seal any air vents that may lead beneath the surface of the cargo
- Confirm that the crew is aware that enclosed space entry procedures must be followed and breathing apparatus must be worn if it is necessary to enter a cargo hold after it has been closed
- Confirm that the master is familiar with the Appendix to the IMSBC Code schedule for coal, particularly:
 - the general requirements for all coal cargoes
 - the special precautions for self-heating coals including the action to be taken if the level of carbon monoxide in any cargo space reaches 50 ppm or exhibits a steady rise over three consecutive days

- the special precautions for coals emitting methane
- the procedures for gas monitoring of coal cargoes

Also, but only if the coal is declared to be both Group A and Group B:

- Check the validity of the Certificate(s) of Test
- Carry out regular can tests on samples drawn from cargo presented to the vessel for shipment
- Reject any cargo which exhibits free moisture or fluid conditions during a can test
- Report any other signs which suggest that the moisture content of the cargo may exceed the TML
- Suspend cargo work and closing the hatch covers during periods of rain
- Ensure that the shippers re-test the moisture content of the cargo in the event of significant rain

During loading the holds should be sealed if a delay of more than an hour is anticipated. On completion of loading the cargo should be trimmed reasonably level to the boundaries of the cargo hold to prevent the development of fissures. Fissures increase the surface area of the cargo exposed to the air and thereby the risk of self-heating. Each hold should be closed immediately on completion, and hatch sealing tape may be applied to the hatch covers as an additional precaution. Only natural surface ventilation is permitted, limited to the absolute minimum time necessary to remove any methane which may have accumulated. Any vents that lead below the level of the cargo should be sealed as the introduction of air into the body of the cargo may promote self-heating.

The IMSBC Code states that personnel should not enter the cargo holds during the voyage due to the presence of methane and the possible hazards of toxic carbon monoxide gas and the depletion of oxygen if the cargo starts to self-heat. If it is essential to enter a hold, self-contained breathing apparatus must be worn and enclosed space entry procedures followed.

For bulk cargoes such as coal which are liable to emit toxic or flammable gas or lead to the depletion of oxygen, the IMSBC Code and SOLAS Chapter VI require the ship to carry an Administration approved gas detector. The gas detector must be capable of measuring levels of methane, oxygen and carbon monoxide inside the holds without having to enter them. Gas detectors must be regularly serviced and calibrated in line with manufacturers' recommendations, and ships' personnel should be trained in their use. The IMSBC Code also requires vessels carrying coal to be provided with a means of measuring the pH values of cargo bilge samples.

Since coal emits carbon monoxide gas if it begins to self-heat, monitoring the amount of carbon monoxide inside a cargo hold is the most effective method of detection. Sampling points should be fitted to both sides of each cargo hold, either to the coaming or to the hatch covers, to ensure flexibility in the event of heavy weather. As far as practicable the same sampling points should be used when testing the atmosphere inside the cargo holds to ensure consistency.

The IMSBC Code also recommends that the ship monitors the temperature of the cargo in the holds from external locations during loading and while on passage, although the development of a hot spot in the coal may not be detected unless a temperature probe is located nearby. All gas detector and temperature readings should be recorded while loading and during the voyage.

Under normal conditions each cargo hold should be sampled daily and surface ventilation should be stopped at least four hours prior to sampling. If the carbon monoxide level is found to exceed 30 ppm, samples should be taken twice daily. If the readings exhibit a steady rise over three consecutive days or reach 50 ppm, a self-heating condition may exist. In such an event the cargo hold including the ventilation arrangements should be completely sealed.

The IMSBC Code further advises that the master should contact the company immediately if it appears that the cargo has started to self-heat. In addition the shipper should be notified and the Club should be informed as it may be necessary to appoint an expert to assess the situation and provide additional advice.

Such information should include:

- *Identity of the cargo spaces involved; monitoring results covering carbon monoxide, methane and oxygen concentrations*
- *If available, temperature of the cargo, location and method used to obtain results*
- *Time gas sample taken (monitoring routine)*
- *Time ventilators opened/closed*
- *Quantity of coal in hold(s) involved*
- *Type of coal as per cargo information, and any special precautions indicated on information*
- *Date loaded, and ETA at intended discharge port (which shall be specified)*
- *Comments or observations from the ship's master*

In the event of a fire, boundary cooling of the affected holds should commence immediately and the master should consider heading towards the nearest port. Again, the Club should be notified without delay as the attendance of an expert may be necessary.

In the event of any queries, please contact the Loss Prevention department.

The Club is grateful to Burgoyne's for the provision of information leaflets on "Self-heating of coal cargoes – Kalimantan, Indonesia" and "Gas Detectors" which form the basis of this Notice to Members. Copies of both leaflets are available on the Club's website.

This Notice replaces Notice to Members No.12 2010/2011 which has been cancelled.

Yours faithfully

For: **West of England Insurance Services (Luxembourg) S.A.**
(As Managers)

M W H Williams
Director