THE LONDON P&I CLUB

STOP Loss

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Iron ore from Sierra Leone

By Brookes Bell

Sierra Leone is still recovering from the effects of civil war, but two shippers have resumed exports of iron ore, some of which are Group A (capable of liquefying) under the IMSBC Code. Recent cases in which Brookes Bell travelled to Sierra Leone acting for Members of the London P&I Club confirmed that ships can be offered cargo which is unsafe because the actual moisture content exceeds the Transportable Moisture Limit. Dealing with such problems can be particularly difficult because of the limited local expertise and technology, and poor communications.

One shipper trucks iron ore concentrate from its mine at Marampa to the Thofeyim river terminal, where it is loaded onto barges and transported to geared ships at the Freetown inner anchorage. The other shipper transports iron ore by rail from its mine at Tonkolili to the Pepel river terminal from where 35,000 mt dwt, self-discharging 'transfer ships' transport the cargo to larger ships at the outer anchorage.

Of course, the IMSBC Code requires representative samples of Group A cargoes to be properly analysed so that the appropriate information/certification on Transportable Moisture Limit (TML) and actual moisture content is available to the Master prior to loading. Brookes Bell have learned that while there are local laboratories which can measure the moisture content there is no facility in Sierra Leone with the equipment necessary to establish the TML of a sample. One attempt at confirming compliance with the Code involved a surveyor sampling the cargo for the first time during trans-shipment at anchor and then seeking to establish the moisture content by drying out the samples in an oven in the ship's galley. The resultant uncertainty over the characteristics of the cargo and whether it is safe to load has led to very extensive delays during loading.

At a simple level, where Owners/Charterers have felt compelled to verify the condition of apparently wet cargo offered for shipment there are significant logistical problems in accessing the stockpiles either at the mines or river terminals. The long and difficult journeys can involve both road and river transport and, because of the lack of on-site accommodation, may need to be repeated frequently.

Both shippers are now aware of their obligations under the IMSBC Code and appear to be trying to avoid offering wet cargo and/or inadequate certification. However, Brookes Bell and the London P&I Club expect some difficulties to remain, particularly as both shippers plan to increase their export volumes. Any Member, whether Owner or Charterer, considering fixing for loading iron ore from Sierra Leone is advised to give early notice to the Club which can assist in establishing whether the sampling and testing of the material consignment has been conducted properly.

Brookes Bell is a major independent marine consultancy with offices in the United Kingdom, Shanghai and Hong Kong. Our Master Mariners, Marine Engineers, Consulting Scientists, Naval Architect, Metallurgist and Cargo Surveyors provide expert advice to the shipping and insurance industries. For more information please visit: ***www.brookesbell.com***

In this issue

By Minton Treharne & Davies

Loading coal in Indonesia: current situation confronting Masters and Owners

There continue to be fire incidents involving Indonesian 'steam' or non-coking coal throughout the supply chain, as well as dangerous levels of flammable gas in cargo holds. Continued vigilance is required to manage this cargo and ensure its safe carriage. Relevant sources of information for assessing cargo safety are: the Cargo Declaration and supporting documentation/certification; pre-load cargo temperature surveys; and gas and temperature measurements from sealed cargo spaces.

Self-heating

The Coal Schedule in the IMSBC Code requires the temperature of the cargo to be no higher than 55ºC, above which self-heating may occur. Self-heating and spontaneous combustion are phenomena whereby coal heats to ignition without any external heat source. Although some Cargo Declarations suggest these cargoes have no history of self-heating or spontaneous combustion, we are presently unaware of any evidence supporting such an assertion. In our experience, all coals of this type should be considered as potentially self-heating, with pre-loading temperature surveys to identify cargo temperatures exceeding 55ºC being key in controlling the hazard.

Measuring temperatures can be difficult because coal is a good thermal insulator, so red hot coal could be within 30cms of cool coal. Thorough temperature surveys by experienced operators should provide reliable measurements, but if there is any doubt or signs of steam, smoke, glowing coals or flames, the Master should request more pre-loading temperature measurements. If an area with a temperature measurement exceeding 55ºC is found within a batch of cargo, it is likely that there are other areas with excessive temperatures. Cargo from the particular stockpile or barge will not comply with the IMSBC Code requirements and should be rejected. Sometimes, coal which has been rejected has been re-presented and Masters should be cautious of accepting such cargoes. Only after active steps have been taken to cool the coal, could it be re-presented and re-surveyed. Active measures might include spreading the coal thinly over a large area and allowing it to cool. Attempts at cooling coal in a cargo hold, on a barge or using water and various chemical agents have proven unsuccessful.

During or after loading, gas monitoring of the sealed holds provides further insight into the cargo condition. Coal naturally emits gases and "weathers", so some oxygen depletion and increase in carbon monoxide is normal. Gas readings showing a rapid increase in carbon monoxide levels and depletion of oxygen may be associated with self-heating but can also indicate de-gassing or a low level oxidation reaction, so early results should be interpreted cautiously. However, if self-heating/combustion occurs, the options are to discharge cargo or keep the hold sealed and sail part-loaded. In general, discharging cargo at load port has proven extremely difficult. Should the ship sail, additional measures are required during the voyage and discharge to ensure the hazard is suitably managed. Other suggested solutions have been to load 'cool' coal on top of known or suspected 'hot' coal, but this is unadvisable as it could enhance a self-heating reaction at the interface, creating a more significant fire risk. If there is self-heating during a voyage or discharge, Masters should seek advice on the management of such situations. Overall, the main objective is to ensure that no coal exhibiting signs of self-heating is loaded in the first instance.

Emission of methane

Although some Cargo Declarations suggest cargoes are unlikely to emit significant amounts of methane, it is usually prudent to expect the emission of methane unless there are test results or gas measurements from sealed cargo holds proving otherwise. Generally, surface venting of the cargo hold is required to remove the flammable gases and maintain a hold atmosphere below 20% of the Lower Explosion Limit (LEL).

Self-heating and the emission of flammable gas

If the cargo emits methane and also produces carbon monoxide (an indicator of self-heating coal), managing the situation becomes more complex. Surface venting removes flammable gases from a cargo hold, but also introduces air (oxygen). The oxygen may result in further self-heating or the formation of an explosive flammable gas/air mixture. Advice should be sought as early as possible in these circumstances.

Reporting

Masters are also reminded that they should inform Shippers if flammable gases and/or self-heating are detected in the coal onboard their ships. The Shippers will then be in a position to amend their cargo declarations to indicate that the coals are liable to emit methane and self-heat, providing information to assist Masters in the future.

Summary

Overall, it would be advisable for Masters of ships transporting Indonesian coals to take into account Special Precautions 1. Coals emitting methane, and 2. Self-heating coals, as detailed in the Coal Schedule of the IMSBC Code.

Minton Treharne & Davies (MTD) is an international company offering engineering and scientific consultancy, surveying and testing services on matters relating to bulk solids, the transport thereof, and numerous other maritime, forensic and engineering matters. For more information, please visit ***www.minton.co.uk***

Maintenance of wires and their records

The London P&I Club's Inspection Programme has recently highlighted several instances of negative findings regarding the ship's lifting equipment register.

Anyone procuring lifting equipment should ensure that they are buying genuine and properly certificated equipment as there are counterfeit products on the market. All ships' lifting gear should be fully recorded in a register, and a system of condition inspection and testing implemented in accordance with statutory requirements.

For many ships, this is incorporated in the Planned Maintenance System and the crew maintains records of inspections and test certificates. The records enable the inspection status of any individual items of lifting equipment in use onboard to be checked. If the equipment is not properly inspected and tested at regular intervals, there is a risk that it may present a hazard to the safety of the crew, and a lack of records could deprive Owners of valuable evidence when dealing with claims.

For example, a recent case involved serious damage to an ISO container and its contents during cargo operations when the container was dropped from height due to a parted wire. Owners can argue that a wire parted due to the stevedores' mishandling, but they would need to show that the equipment had been maintained. If appropriate maintenance records are kept, Owners should be able to demonstrate that the failure of the wire was not due to their omission. In the absence of such records, proving that the equipment was well maintained will prove challenging. Equally, records alone are not enough as non-destructive testing can easily demonstrate whether or not a lifting wire has been properly maintained.

Crew are reminded that relevant paperwork should be kept up to date and that the condition inspection and testing status of lifting equipment should be taken into account in preparing for heavy lift Permit to Work operations and in associated Task Risk Assessments.

MCA Marine Guidance Notice MGN 332 (M+F) is a good source of practical guidance on this subject at: www.dft.gov.uk/mca/332_a.pdf

Hold Cleanliness

Cargo hold paint coatings are expensive to apply and maintain between dry-docks. The carriage of some cargoes, such as scrap, may result in extensive physical damage and abrasion to the coatings, whereas other cargoes can cause staining or hard accretions (petcoke, cement) which can be difficult to remove without the aid of special equipment and chemicals. Where cargoes are carried which are chemically reactive with coatings or steelwork (rock salt, sulphur), it is usual for a physical barrier to be applied to exposed hold boundaries, commonly a lime wash or proprietary "hold block".

Hold cleaning not only removes cargo residues which may have a damaging effect on paint coatings and structures, but also ensures that the holds are fit and ready for the reception of the next cargo. Responsibility for delivering a ship with clean holds lies with Owners, but responsibility for intermediate hold cleaning during a period charter usually rests with Charterers with "customary assistance" from the crew, reflecting the fact that it is Charterers who have control over what cargo will be carried. In anticipation of difficulties associated with the carriage of certain materials, Owners will frequently exclude specified "dirty" cargoes or otherwise place restrictions on the number allowed over the duration of a period charter. In addition to helping preserve the hold coatings, such exclusion avoids the practical difficulties of the crew being asked to clean to a high standard of cleanliness, such as grain clean, after a dirty cargo, a task which can often prove difficult, if not impossible, without additional shore assistance.

The operation requires careful planning, with Owners and Charterers having a realistic appreciation as to what can reasonably be achieved by the ship's crew with the available resources. Hold cleaning on a large bulk carrier can consume considerable resources in manpower, equipment, materials and time in order that the holds may be ready to commence loading upon arrival at the next port. It is therefore of the utmost importance that both Owner and Charterer Members have the following in mind when negotiating fixtures and planning and performing hold cleaning:

- *The current condition of the ship's holds and suitability for anticipated cargoes.*
- *What standard of cleanliness is required both at the commencement of the fixture, arrival at the first load port and, where known, for subsequent agreed cargoes.*
- *Consultation with the master and good communication prior to, and during, cleaning operations.*
- *A good understanding of what can practically be achieved and, in particular, recognition that some areas of the holds may not be fully accessible, such as the upper structures, without the use of specialist shore equipment.*
- *The training and experience of the crew in these operations and familiarity with equipment and cleaning chemicals.*
- *Whether there are any special cleaning requirements or arrangements for the disposal of hold washings or residues.*
- *The time available and the prospect that cleaning may not be possible at sea in adverse weather conditions.*
- *Maintenance of good pictorial records.*

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Bridge Navigational Watch Alarm Systems (BNWAS)

Members will be aware that the SOLAS requirement for the installation of BNWAS applies to all ships constructed on or after 1 July 2011, and is being progressively phased in for passenger and cargo ships constructed before that date from 1 July 2012.

The statutory introduction of BNWAS was significantly influenced by recommendations made by the Danish Maritime Authority and the Bahamas Flag Administration following their joint investigation into the collision of the cargo ship *Karen Danielsen* with the Great Belt west bridge in March 2005. The report concluded that the OOW had probably missed an alteration of course waypoint after falling asleep in the conning position armchair, with the ship maintaining course and speed until colliding with, and becoming trapped under, the bridge span. As a consequence of the collision, the fore mast and cargo cranes were demolished, the wheelhouse completely sheared off at deck level and the chief officer on watch tragically killed.

The purpose of BNWAS is to monitor bridge activity and detect operator disability which could lead to marine accidents. The system monitors the awareness of the OOW and automatically alerts the Master and other officers if the OOW becomes incapable of performing his duties, for whatever reason. The system relies on a predetermined sequence of visual indications and alarms that will activate after the expiry of a set dormant period and which must be reset by the OOW before alarms are sounded in positions that will alert the Master, back up OOW and other crew members. BNWAS performance standards are specified in IMO Resolution MSC 128(75) and include provision for alarms and manual reset functions to be located at wheelhouse conning positions and navigational workstations, designed in such a manner so as not to cause undue distraction or affect the keeping of a safe navigational watch. Reset functions may also be initiated by motion sensors or external inputs from other navigational equipment capable of registering the physical activity and mental alertness of the OOW such as radar, ECDIS, INS, etc.

Although the *Karen Danielsen* accident report cited that the use of a bridge watch alarm would probably have prevented the incident, the likely underlying reasons for the chief officer's incapacity included the influence of alcohol, fatigue and the failure to post a dedicated lookout in conditions of darkness. The cause of the incident is also by no means unique, with several notable casualties being attributed to OOW's falling asleep where fatigue or other factors have been identified or implicated as being involved. It must therefore be emphasised that these new regulations are in no way meant to undermine or be a substitute for strict adherence to requirements to maintain a safe navigation watch, STCW requirements for preventing OOW fatigue and compliance with drug and alcohol policies for watchkeepers.

Maintenance of Cargo Hold Pipework

The Club regularly receives notifications of incidents or claims involving wet damage to cargo caused by holds flooding.

Leakage from pipework within holds continues to be a common cause of cargo wetting. Of particular concern are leaking top side tank drain pipes and wells when located near or below the load water line which can result in catastrophic hold flooding.

By way of preventative maintenance, pipes should be monitored for signs of corrosion and kept well coated. Exposed pipework vulnerable to contact by cargo handling equipment should also be fitted with protective guards or covers and securing clamps should be complete. Every opportunity should be taken to inspect difficult to access pipework in the upper hold areas at, and between, scheduled dry-dockings.

However, even well maintained pipework may become holed or fractured due to impact or vibration, and it is therefore important that thorough checks are routinely made of these fittings prior to loading cargo. Pipework which should be inspected includes ballast and bunker tank air vent pipes, tank sounding pipes, draught gauge pipes, fire mains, scuppers and top side tank overboard discharge pipes. Particular attention should be paid to locations of coating breakdown, corrosion and obscured sections of pipe on the blind side adjacent to bulkheads or behind pipe protective covers. Any signs of heavy scoring, deformation or indentation of the pipes or guards should be investigated to check whether the integrity of the pipe has been compromised.

The integrity of ballast tank air and sounding pipes should ideally be verified by carrying out hydrostatic tests, whereby the tanks and pipes are completely filled and a check made for leaks. It is also good practice to confirm the wall thickness of pipework when periodic Class ultrasonic measurements are performed.

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