LP BULLETIN

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Bulletin 602 - 9/08 - Shipping nickel ore - Indonesia

The Association is concerned about current bad practices, on the part of mines and shippers, with the shipment of lateritic nickel ore. Ken Grant, Executive Director of Minton Treharne & Davies (S) Pte Ltd, highlights below the concerns that should be brought to the attention of lines intending to fix vessels for the carriage of this commodity.

"Background
The author has previously published an article on the failure of the nickel ore mines to accurately determine the flow moisture point (FMP) and Moisture Content (MC) of lateritic nickel ore, which is essential for its safe shipment. The previous article can be provided by enquiring to kengrant@minton.com.sg.

There are continued problems with the carriage of nickel ore, which has been exacerbated by an increase in the number of new mines, where the operators may have little or no experience of its properties or shipment. Attempts to control its quality are being severely hindered by the mines more aggressive approach, in preventing attendance at the remote sites and threatening cargo experts and surveyors.

New operations
In the past year we have dealt with a number of problems on the Indonesian Island of Sulawesi. Generally, we expect further problems as new mines have also started operation on the islands of Halmahera and Papua. Not all of these mines have testing facilities, with the FMP being estimated – a practice contrary to SOLAS and the BC Code.

When facilities were available they tend to focus on the nickel content of the ore to maximise its value. The ore is an inhomogeneous mixture of fine clay-like particles and larger rock-like particles, which need to be sampled and processed to give a homogeneous fine powder for analysis. Processing cannot be accurately achieved when the cargo is too wet, but it is facilitated by natural drying. We have observed these samples also being used to determine the commercial MC of the cargo, which receivers use to minimise the amount of water they are paying for. This commercial MC has also been used to represent the MC of the cargo to be shipped. This is not acceptable as the MC of the partly air-dried sample is no longer representative of the cargo from which it was taken. Also, as it is the fines/clay-like material that undergoes liquefaction (the stones will not liquefy and their presence will not prevent liquefaction of the cargo), it is critical that we know the MC of the fraction that liquefies for comparison with TML; the latter being determined only on <7mm particles. The larger stones have a significantly lower MC and their inclusion in the CM samples can make it appear that the cargo is below TML, while the liquefiable portion of the cargo is actually above TML.

It is also important not to confuse the Commercial MC with FMP. Even though a receiver may be willing to accept cargo with a MC of 35wt%, it can only be accepted by the vessel if this is below TML.

Established operations
Identification of a flow state is required for determining a FMP. We reported previously that the Halmahera mines used a sample cone expansion of 3mm to identify a flow state. During a recent

visit to one of these mines, the operators had changed this criterion to a subjective change in the shape of the cone.

Appendix 2 of the BC Code states that when the FMP is passed “the moulded sides of the sample may deform”. Image 1 illustrates the shape of a sample cone for a sample below FMP, while image 2 shows the shape of a sample cone after recent testing at a mine in Halmahera. Despite the cone being deformed, with a recorded cone expansion >6mm, it was regarded as being below FMP. The sample was not failed until the cone had expanded by a massive 20mm, as shown in image 3, with a declared FMP of 33.8%. Previous criterion would have given a FMP <31%. The mine were unable to justify their change of methodology, which ignored all the key indicators of a flow state (see page 252 of BC Code – 2004 Ed.), and enabled them to ship wetter cargo at a greater risk to the carrier.

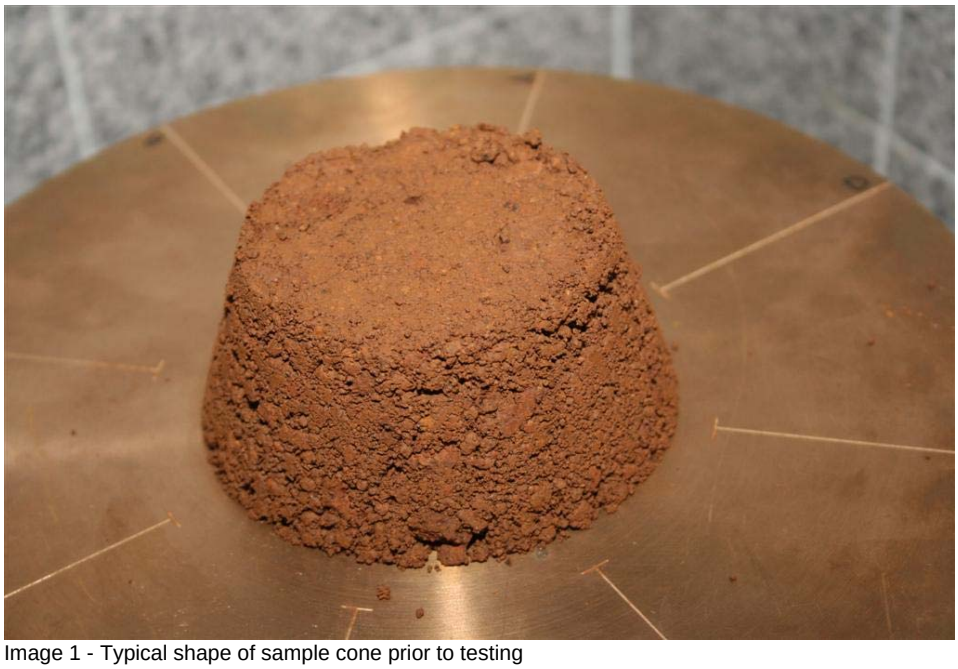

Image 1 - Typical shape of sample cone prior to testing

Image 2 - Change in shape of sample cone after testing, corresponding to a 6.5mm cone expansion

Image 3 - Sample cone after testing with 20mm expansion at base

Liquefaction of lateritic nickel ore

Lateritic nickel ore is known to liquefy. In 1988 the Mega Taurus was carrying ore from the Philippines when it capsized with the loss of all 20 crewmen. In 1988 the Sea Prospect was shipping ore from Indonesia when it capsized with the loss of 10 lives. Other vessels have been more fortunate. In 1990 the Oriental Angel developed a list after loading cargo in New Caledonia; this being repeated in 1999 with the Padang Hawk. The same fate befell the Jag Rahul in 2005 when carrying ore from Indonesia. In December 2007 we attended a vessel after its Philippine cargo had liquefied (see images 4 and 5).

Through correspondence with interested parties I am aware of many other incidents that go unreported, as the vessels have managed to reach discharge port without serious incident (although not without significant risk). This has a negative impact on attempts to improve safety, as it is perceived that there is no problem. At a time when the mines appear willing to do what is necessary to ship their cargo, I would encourage owners and charterers to monitor their shipments of nickel ore for evidence of cargo movement and accuracy of Shipper's Declarations. In this respect MTD (Singapore) are happy to act as a focus point. We have the only independent test equipment in the region, and we are currently collating a database. The more knowledge we have on nickel ore the safer we can make its shipment."

Image 4 - Liquefied lateritic nickel ore

Image 5 - Liquefied lateritic nickel ore

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