Market Update Note
21 January 2014

Cylinder Lubricating Oil
Update on Mid-Range Oils
MAN B&W Two-Stroke Diesel Engines

The lubrication of MAN B&W two-stroke engines is of the utmost importance as it has an influence on operational costs, cylinder condition, general engine condition and, thereby, overhauling schedules and maintenance costs.

Due to high fuel prices, the market has called for fuel savings at part load. We have responded by introducing new part-load optimised engines and methods to part-load optimise existing engines. However, these optimising methods have contributed to an increase in cold corrosion in the combustion chamber, and we have received reports of increased wear of cylinder liners and piston rings and depletion of the cylinder lube oil (CLO).

Our experience has shown that an increased amount of CLO, or CLOs with a higher neutralising capacity (higher base number), can protect against excessive corrosion. An increased CLO amount will stabilise the wear rate to normal levels. We have also experienced that a low CLO feed rate, or a CLO with a lower neutralising capacity (lower BN), might not be sufficient to protect the engine against excessive corrosion, with increased wear rates as the result.

Based on our experience, this market update note clarifies our recommendations for choice of cylinder lube oil. The design base for choice of cylinder lube oil is summarised in Fig. 1.
General overview of design base for choice of cylinder lube oil types:

Today, a considerable number of engines are in operation using what is referred to as mid-range cylinder lube oils (40<BN<70). These oils have been given a No Objection Letter (NOL) by MAN Diesel & Turbo after testing for 4,000 to 6,000 hours with acceptable results. Recently, we have updated the NOLs for all mid-range oils, specifying restrictions for our no objection for the usage of these oils. These restrictions are valid for all mid-range cylinder lube oils.

**MDT recommendations for use of mid-range cylinder lube oils:**

MDT has no objection to the usage of the mid-range cylinder lube oils on the following MAN B&W two-stroke engine designs: **Mark 7 and older**. This is provided that the recommendations in our latest issued engine type specific guidelines are followed, and that the following conditions in particular are fulfilled:

1. The oil must be categorised according to the BN measured, for instance a 50, 55, 57 or 60 BN oil, and the feed rate must be set proportionally higher than for a 70 BN oil.
2. The BN and total iron (Fe) in the drain must be carefully monitored, and the values measured must be in accordance with our latest issued engine type specific guidelines.

MDT is not able to recommend the usage of the lube oil on our following engine designs:
- Mark 8.1 and further (e.g. S80ME-C8.1)
- Low-load or part-load optimised engines, e.g. with T/C cut-out, EGB (exhaust gas bypass), WHR (waste heat recovery), VT (variable turbine) and ECO-CAM.

**Operation on low-sulphur heavy fuel oil (0.5-1.0% sulphur)**

- As an exception to our latest engine type specific guidelines issued, MDT has no objection to the usage of the mid-range oils on engines operating on low-sulphur heavy fuel oil (LSHFO). This applies to all engine designs.
- In regards to LSHFO, MDT has no objection to the usage of the lube oil for longer periods (periods exceeding two weeks).
- However, for operation on a fuel with a sulphur content lower than 0.1%, the cylinder lube oil must be a BN40 or lower.
Only the full and complete version of this letter may be reproduced and/or displayed by the receiver.

Best regards,
MAN Diesel & Turbo

Ole Grøne
Kjeld Aabo