Optimised cylinder oil feed saves US$93 000/year

As part of an ongoing effort to minimise the total cost of operating its fleet without compromising safety, Athens-based Kristen Navigation is using ExxonMobil's Feed Rate Optimization programme

According to an engineering report from the oil supplier and Kristen Navigation, the programme enabled engineers onboard the tanker *Astro Cygnus* to gradually reduce the amount of cylinder oil in its MAN B&W 6S90 MC-C engine by approximately 10%, maintain acceptable cylinder liner wear levels, and save a projected US$93 000 annually.

The goal of the ExxonMobil programme is to assist shipping companies to save money by helping balance the cost of cylinder oil with the expense of wear-related maintenance. It does this by analysing scrapedown oil to detect changes in the condition of a crosshead marine diesel engine's cylinders. The programme's portable onboard testing unit, the Mobilgard Scrapedown Analyzer or MSA, enables engineers to quickly detect subsrantive changes in cylinder condition while comprehensive analysis of scrapedown oil samples is done at ExxonMobil's Signum Oil Analysis laboratory.

For Kristen Navigation, the cornerstone of the Feed Rate Optimization programme is Mobilgard 570, a cylinder oil developed by ExxonMobil to protect slow-speed, two-stroke crosshead engines. The lubricant is formulated to an optimised viscosity level and features high quality base oil to provide excellent thermal and oxidation srability, and protection against engine deposits and wear. Mobilgard 570 and Mobilgard L540 (for low sulfur fuel applications) are designed to provide these performance features even as lower feed rates are adopted.

The tanker *Astro Cygnus* where the Alpha ACC setting was lowered from 0.19 to to 0.17g/bhp.h*S% when using ExxonMobil's Feed Rate Optimization programme

Real-world test laboratory

Astro Cygnus is a double-hulled tanker built in 2001 and powered by an MAN B&W 6S90 MC-C engine that produces 40 000bhp at 76rev/min and is fitted with an Alpha lubrication system. The Alpha system's computer-controlled algorithm (Alpha ACC) distributes oil to the engine's cylinders. According to MAN Diesel this has two purposes — to provide the appropriate oil dosage proportional to the percentage of sulphur in the fuel, and to provide cylinder oil dosage proportional to rhe engine load.

Since its launch, *Astro Cygnus* has been the subject of intense scrutiny by Kristen Navigation, ExxonMobil Marine Lubricanrs and MAN Diesel. From the start, their objective was to optimise feed rates and reduce oil consumption, with rhe vessel becoming a kind of *de facto* real-world test laboratory.

Kristen Navigation has been using the Feed Rate Oprimization programme since it was introduced in 2003. Stavros Hatzigrigoris, managing director of the shipping company says, 'It has helped us significantly reduce the fleet's cylinder oil consumption without increasing our wear rates.'

In 2005, the company reduced rhe Alpha ACC setting on *Astro Cygnus* from the original specification of 0.25 to 0.21g/bhp.h*S%, with a subsequent reduction to 0.19g/bhp.h*S%. The changes were made with MAN Diesel's approval after reviewing both onboard and laboratory oil analysis data from the Feed Rate Optimization programme, along with engine liner data. These reductions were shown to have produced a potential annual savings of more than US$181 000.

In 2006, Kristen Navigation and MAN Diesel decided ro reduce further the Alpha ACC setting on *Astro Cygnus* — down from 0.19 to 0.18g/bhp.h*S% in January and from 0.18 to 0.17g/bhp.h*S% in April. The average sulphur level of the fuel during the testing period was 2.76%. MSA data and liner wear measurements from scavenge port inspections of oil samples were again used to monitor wear levels on a regular, systematic basis.

- Cylinder oil consumption was reduced by approximately 10%. Over a year, this reduction translates inro an overall saving in oil used of 16 500l
- Liner life was not compromised at an Alpha ACC setting of 0.17g/bhp.h*S%. Wear rates remained acceptable and within the shipping company's target of 0.02 – 0.04mm/1000h
- Scavenge port inspections conducted by MAN Diesel in March 2007 showed that the piston rings were generally clean and free of deposits.

This most-recent, additional reduction resulted in rhe further projected monetary savings of US$93 000 annually.

'Even with sophisticated lubricator systems, such as Alpha ACC, that are intended to reduce cylinder oil consumption, additional savings can be realised by optimising feed rates,' says Mike Hawkins, global marketing manager, ExxonMobil Marine Lubricants. MER