

Lubricant use optimisation bears fruit

One of the world's largest tanker fleets saved more than \$450,000 in lubricant costs in 2008 by optimising cylinder oil feed rates on 20 vessels, according to an engineering report written by Frontline Management and ExxonMobil Marine Lubricants. The sum is in addition to savings of \$150,000 achieved the previous year on 11 tankers.

Frontline reduced cylinder oil usage without compromising cylinder wear using the ExxonMobil Feed Rate Optimization Program. According to the company, the objective of the programme is to reduce a crosshead diesel engine's operating costs by optimising the amount of lubricant used and decreasing the amount of wear-related cylinder maintenance. As the oil feed rate is gradually reduced, vessel personnel, using on board testing kits and ExxonMobil's land-based Signum Oil Analysis laboratory,

Frontline has reduced cylinder oil consumption on 20 tankers claiming substantial annual savings.

measure engine wear by analysing iron and TBN levels in scrapedown oil samples at regular intervals.

This technology, which is used in accordance with recommendations of the engine builders, detects changes in the condition of the cylinders so that vessel engineers can safely reduce the cylinder oil feed rates without increasing wear. Savings come from reduced oil consumption and maintenance improvements, due to enhanced monitoring. This can include potential wear-related reductions due to fewer piston deposits.

The programme pinpoints an engine's

optimum, most cost-effective feed rate, while providing an early warning for many potential mechanical issues.

"By optimising cylinder oil consumption, we're reducing cost and supporting Frontline's strategy of lean vessel operation emphasising safety and quality maintenance," said Petter Lalic, project engineer for Frontline. But there are other significant advantages, he pointed out. "The reduction in consumption will further decrease the environmental impact of producing and transporting lubricants, as well as help to minimise lubricant-related emissions from our vessels."

How it works

The idea of optimising feed rates is a direct result of recent changes in the maritime industry. Engines have been redesigned by their manufacturers for greater efficiency, putting increased stress on the cylinder oil. At

Optimising cylinder oil consumption not only saves Frontline money, it further decreases the environmental impact of producing and transporting lubricants, and helps to minimise lubricant-related / vessel emissions.



the same time, environmental regulations have dictated more use of low-sulphur content in heavy fuel oil.

Part of ExxonMobil's solution was to develop a feed rate optimisation programme to help vessel owners safely reduce oil feed rates gradually while monitoring cylinder wear. The technology was designed to capture detailed analytical data on used cylinder oil as a way to evaluate an engine's operating condition as feed rates were reduced.

Vessel personnel are issued with an on board test kit, as well as a portable on board testing unit, Mobilgard Scrapedown Analyzer (MSA), to check for iron. The MSA measures iron in used oil taken from the scavenge drainpipe once or twice per week. Measurements correlate to the condition of the cylinders, enabling vessel engineers to quickly detect substantive changes.

In addition to measuring iron and TBN, which are indicators of corrosive wear, the on board equipment measures water and viscosity. Taken together, the results enable the vessel's chief engineer to monitor wear while the engine is up and running.

Technicians simultaneously conduct comprehensive analysis of scrapedown oil samples at ExxonMobil's Signum Oil Analysis laboratory. This confirms information measured on board and also provides more detailed insights through additional testing.

In addition to providing a base line for reducing feed rates, scrapedown analysis works as a predictive maintenance tool, or early warning system. It typically identifies problems such as leaking stuffing boxes and worn piston rings, and leads to the potential reduction of unexpected engine downtime due to potential cylinder liner casualties.

Large fleet

Frontline's strategy involves extensive outsourcing, with crewing and other services provided by a number of independent and competing shipmanagement companies.

In total, Frontline's fleet is composed of 77 vessels, with a further 16 newbuilds. The



The combined feed rate reduction for all 20 vessels in the ExxonMobil Feed Rate Optimization Program was 9.3%. Frontline saved more than \$450,000 on cylinder oil costs and didn't compromise cylinder wear.

company has 40 VLCCs, eight OBOs carriers and 29 Suezmaxes. Of these, 20 vessels were selected for participation in the feed rate reduction programme - six VLCCs, seven OBOs and seven Suezmaxes.

Increasing global environmental concerns, Frontline said, have created a demand for vessels that are able to conform to the stringent environmental standards currently being imposed throughout the world. It emphasises operational safety and quality maintenance on all of its vessels.

Frontline engineers worked closely with ExxonMobil to realise savings. All 20 vessels were lubricated with Mobilgard 570, a key component of the Feed Rate Optimization Program. According to the lubricant supplier, this patented cylinder oil, which was formulated for modern marine engines, utilises consistently high-quality base oils and innovative additive technology to ensure excellent performance.

On board sampling of scrapedown oil was

completed weekly and after fuel changes. Additional samples were sent to the Signum Oil Analysis laboratory every three to six months. Profiles of each vessel were established, noting loads, fuel sulphur levels, feed rates and various relationships to iron, TBN and other data. Based on the measurements, ExxonMobil recommended feed rate adjustments for each vessel. The combined feed rate reduction for all 20 vessels was 9.3%. This resulted in annual savings of more than \$450,000 in lubricant costs, with additional savings expected from reduced maintenance expenses.

"By using this type of step-out technology to monitor the real-time condition of cylinders, we can help our customers optimise feed rates and reduce the expense of wear-related cylinder maintenance," said Shaara Blome, global marketing manager, ExxonMobil Marine Lubricants. "A welcome bonus is cost savings, and these have proven to be substantial for Frontline."

10

“By optimising cylinder oil consumption, we’re reducing cost and supporting Frontline’s strategy of lean vessel operation emphasising safety and quality maintenance.”

Petter Lalic, project engineer, Frontline.

”