

Trials prove that Mobilgard™ M430 is compatible with dual-fuel engines running mainly on LNG

- Customer:** Mitsui O.S.K. Lines (MOL) LNG
- Vessels:** Spirit of Hela and Gigira Laitebo
- Products:** Mobilgard™ M430
- Engine:** Wärtsilä 50DF
- Benefit:** More than 675,000 hours of fleet-wide use of Mobilgard M430 proves that dual-fuel engines running predominantly on LNG are compatible with the high BN lubricant

Benefits summary

The dual fuel engines of the LNG tankers Spirit of Hela and Gigira Laitebo were inspected as part of routine maintenance after running for around 18,000 hours using Mobilgard M430, a 30 base number (BN) lubricant design for medium speed engines running on heavy fuel oil (HFO). The vessels predominantly ran on LNG, which risked the lubricant's additives accumulating as deposits on the piston crown and in the piston ring grooves as there was no sulphur to neutralise.

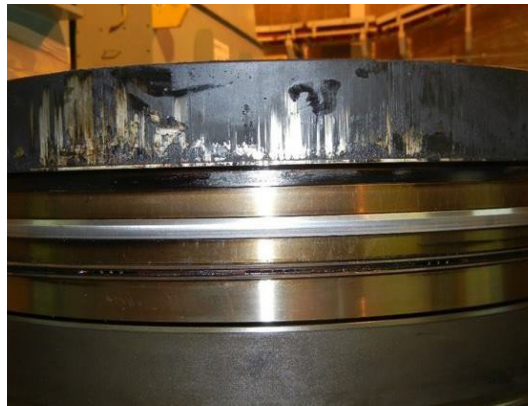
The inspection, and ExxonMobil's Signum™ Oil Analysis results, demonstrated Mobilgard M430's capacity to provide excellent, trouble-free, long-term protection for dual-fuel engines running predominantly on LNG.

This provides operators with the opportunity to use a single lubricant for their dual-fuel engines, removing the need to switch oils at fuel changeovers while also streamlining inventory, saving both time and cost.

Situation

Operators of dual fuel engines face unique challenges. It is industry practice to select the best oil for the principal fuel but operators must also choose a lubricant that provides the best protection against the most aggressive fuel the engine will run.

Engines running on LNG would customarily use an oil with a low BN, as this sulphur-free fuel does not require the lubricant's additives to neutralise



Piston ring grooves very clean after running 16,500 hours, predominantly on LNG.

sulphur. It was generally assumed that additives in high BN products would gradually accumulate without the presence of sulphur, creating problematic deposits. With this in mind, many vessel operators running dual fuel engines will use multiple oils, swapping lubricants as they change between fuels.

Breaking conventions, MOL LNG's Spirit of Hela and Gigira Laitebo LNG tankers exclusively used Mobilgard M430 in their medium speed, dual-fuel engines. Although predominantly running on LNG, this oil was chosen to ensure full protection for the times the engine ran on HFO or distillate fuel.

Having run for approximately 18,000 hours using Mobilgard M430, the vessel's Wärtsilä 50DF engines were expected to show signs of deposits. When the Signum Oil Analysis results revealed no issues ExxonMobil engineers contacted MOL LNG to investigate further.

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Solution

ExxonMobil engineers reviewed the Signum Oil Analysis results from various of the operator's vessels, totalling 24 dual-fuel engines, which in total had run on either Mobilgard M430 or Mobilgard M440 for 675,000 hours.

Results showed no issues with the oil or wear levels and MOL LNG confirmed that it had not undertaken any extra servicing and that during standard engine overhauls, was happy with the fleet's reliability, and had been very pleased with the level of cleanliness.

Looking at the reports from Spirit of Hela's 16,500 hour standard service, ExxonMobil engineers noted that the engine's piston rings were exceptionally clean.

In excess of 675,000 hours of problem-free operating, backed up by Signum Oil Analysis results, have proven Mobilgard M430's bespoke formulation has the ability to keep engines clean and deposit free when operating long-term on LNG.

Benefits

Years of operating experience confirm that dual-fuel engines can run problem free on LNG for extended periods when using a high BN ExxonMobil lubricant.

Operators can now be safe in the knowledge that their engines will have the high level of cleanliness and protection they expect from a lubricant, without the need to alter oils whenever fuels are changed. This field trail dispels the industry perception that high BN oils and LNG should not mix.

Furthermore, the use of a single lubricant provides operators with a significant cost saving, also removing the complexity related to the storage and management of multiple lubricants.

Note: Not all engines may see the same outcomes; results are based on good maintenance and operating procedures.

For more information about Mobilgard M430, please contact your ExxonMobil representative or visit

www.exxonmobil.com/marine