SEA-Mate® Blending-on-Board

Fit-for-Purpose Lubrication

CASE STUDY: JS Greensail – Evergas

Installation of the Blending-On-Board system was completed in 4th quarter 2017, while the vessel was sailing. Since then, the crew have used Blending-on-Board (BOB) to produce a fit-for-purpose cylinder oil on-board. The operator is now able to blend the lubricant characteristics needed for a suitable, optimized and safe engine operation, whilst lubricating the cylinders with a minimum and optimized cylinder lubrication feed-rate. While JS Greensail is one of the smaller vessels with Blending-on-Board installed, great benefits have been achieved with the implementation.

VESSEL DATA

Year of building:	2014
Vessel type:	LPG Tanker
Main engine:	MAN B&W 5S46ME-B
Main engine power:	5800 kW
BOB retrofit completion:	Q4 2017
Cylinder lubrication system:	Alpha Lubricators
Cylinder lubrication feed-rate (Q4 2017):	1,02 g/kWh
Cylinder lubrication minimum feed-rate:	0,6 g/kWh

REDUCED LUBRICATION COST AND IMPROVED CYLINDER UNIT CONDITION

After the blender installation, JS Greensail have managed to reduce the feed-rate from 1,02 g/kWh to 0,76 g/kWh. A total cylinder oil consumption reduction of 26 %, while keeping a steady low feed rate.

CYLINDER LUBRICATION FEED-RATE REDUCTION

(Data from 2017-2019)

	Pre BOB (reference)	2018 Feb-Oct	2018 Oct-Dec	2019 Jan-Feb
Feed-rate (g/kWh)	1,02	0,99	0,87	0,76
Total reduction (g/kWh)	0	0,03	0,15	0,26
Feed-rate reduction (%)	**100%**	**-3%**	**-15%**	**-26%**

"We have been able to optimize the lubrication, reduce the feed-rate and stabilize the cold corrosion formation. And at the same, reduce our oil consumption" Says Dinesh Sharma, Senior Vessel Manager at Evergas.

Blender B500Mk2

TOTAL CYLINDER OIL CONSUMPTION REDUCTION OF 26 %

JS Greensail

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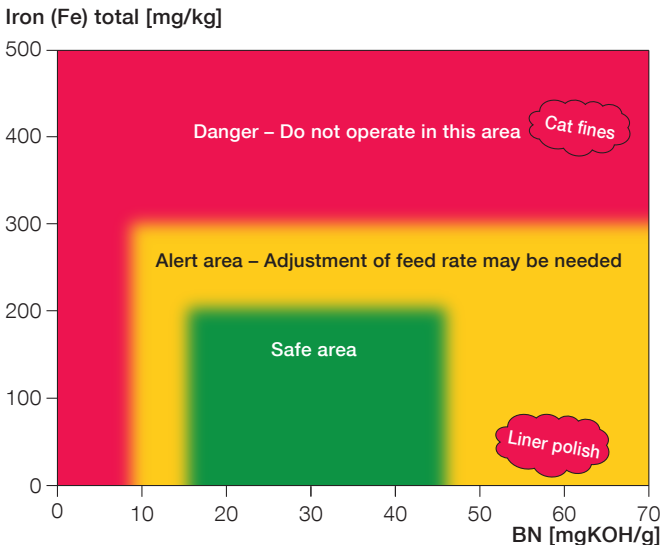
WITH BOB INSTALLED

With BOB installed, there will not be a need to adjust the feed-rate corresponding to various operating conditions. Instead, the BN value of the cylinder oil is adjusted, while keeping the feed rate constant. The blended cylinder oil will have the optimal neutralization and detergency capabilities and it is possible to run cylinder lubrication at a fixed low feed rate, regardless of the fuel Sulphur in use.

By using a recommended onboard scrape down test kit, the crew can easily monitor the condition of the cylinder units by performing periodic drain oil analysis. This will secure the best cylinder oil settings for the specific engine.

In order to secure successful implementation of Blending-on-Board, Evergas ensured a back-to-back rotation of the Chief Engineers and priority was given to proper training of the crew, leaving no shortfall while implementing a different lubrication operation and strategy.



Drain oil Iron vs. BN, SL2014-571

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Another key enabler in the change-management process, was communication between vessel and superintendent, where exchange of detailed information and clear recommendations, resulted in a safe optimization procedure.

Complementing above work by Evergas, MFT also provide free of charge lubrication and engine condition monitoring service to each vessel, through online data exchange. This ensure that optimization guidance as per OEM instruction is provided to the crew and keeping focus on the importance of lubrication.

From weekly scrape down samples performed by the crew, data analysis shows an average iron content (corrosive and magnetic) of 250 ppm prior BOB installation on JS Greensail. After one month of operation with the BOB system, the total iron content was below 100 ppm and within OEM guideline for cylinder lube oil conditions.

SYSTEM OIL QUALITY

Due to the continuous refreshment of system oil in use, it has been possible to maintain a good system oil quality onboard. Laboratory analysis have shown the system oil is nearly the same as new and fresh system oil with a viscosity at 11,7-11,8 cSt. The refreshed oil also shows a cleaner system oil with a visible cleaner crankcase and oil sump. Clean and fresh system oil will have positive technical impact on TBO's relating to for example FIVA valves, piston cooling, bearings and pre-heater efficiency.

RUNNING HOURS 23,928

RUNNING HOURS 23,928

CYLINDER LINER CONDITION

With the reduction of iron in the cylinder oil scrape down analysis, corrosion formations on the liners have also reduced significantly since the beginning of the BOB implementation. From the latest “Scavenge port inspection” the liner wear and black spots on the liners have reduced and corrosion is now under control.

RUNNING HOURS 6,394

RUNNING HOURS 3,336

PISTON RING CONDITION

Condition of piston rings with the latest measurements for ring grooves shows no indication of unusual wear and looks very good. With the low Iron content present in the scrape down samples, it indictaes the wear has not increased which is usually the fear when the feed rate is reduced.

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EASY OPERATIONS

“The main engine of a vessel should have a flexible lubrication setup, while at the same time, maintaining a high reliability. With the Blending-On-Board system we can now bunker one high BN cylinder oil and and still be capable of running on fuels demanding BN oils in a range of 40-140BN. This means we have a solution that addresses our need to adjust the lubrication oil, according to the always changing conditions.” Says Dinesh Sharma.

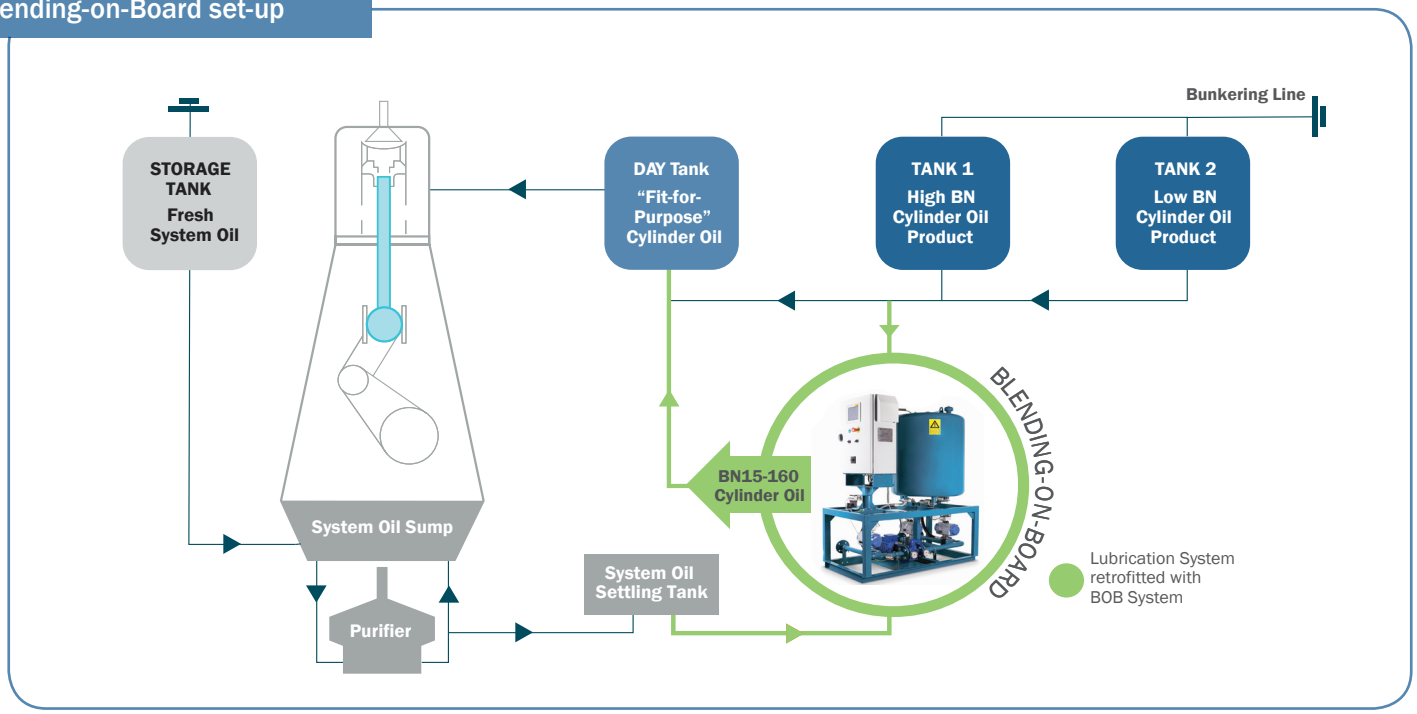
The BOB system does not increase the work load but helps the crew in the daily routine with the already existing tasks. The installation of the blender has shown to be a real positive experience for the vessel JS Greensail. Both crew and engine have experienced its benefits from the implementation and overall the BOB system has been very successful.

2020 REGULATION

JS Greensail is not going to install a scrubber but will continue to have the Blending-on-Board system and blend a Fit-for-Purpose cylinder oil for 2020 compliant fuel operation. With a SEA-Mate Blending-on-Board installed, the vessel eliminated the worries and timing of change-over plans for the cylinder oil, as the vessel can begin to blend the existing cylinder oil to a lower BN when the fuel is changed. Even for 2020 compliant fuels, OEM’s are expecting a continued need for a variety of different cylinder oil BN’s.

With a BOB installation, the result is a cylinder oil fit for the specific operating conditions for each vessel and a reduction of JS Greensail cylinder oil consumption by 26 % on the current used feed-rate, with potential to reduce by another 10-15%.

Blending-on-Board set-up



SEA-Mate Blending-On-Board system with an example of pipe layout.

For more information and contact details, please visit us at www.marinefluid.dk

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