



Wärtsilä, Main Engine, Diesel Electric Propulsion

CJC® Application Study

CUSTOMER

Scandlines, M/F Tycho Brahe, Ferry from Denmark to Sweden (Elsinore-Helsingborg).

SYSTEM

System: Main Engines, 3 pcs. Wärtsilä 6R32 + 1 pc. 6R32 (LNE), each 3,000 kW
Fuel: MDO, ULSD (ECA operation)
Oil Type: Castrol MHP 154
Oil Volume: 1,200 litres

PROBLEM

On the M/F Tycho Brahe, the lubricating oil of the diesel-electric drive was still cleaned in a conventional way with a centrifuge for two engines. The cost of operation for each of the centrifuges amounted to EUR 13,000 – in total, 26,000 EUR per year. The principal costs occur for the energy consumption of the heating.

SOLUTION

On the main engines, DG3 and DG4, a CJC® Lube Oil Filter 27/108 was installed – in standard design and a prototype. The standard filter was fitted on the DG3 main engine, and the prototype – using a frequency controller and a higher flow – was installed on the DG4 main engine. For reference, the centrifuge was left running on the main engines DG1 and DG2.

BENEFITS

The target was to deliver results equal to or better than the centrifuge. The objective was achieved on both the standard CJC® Fine Filter unit and the prototype CJC® Fine Filter unit. The result was so impressive, that the crew reported visual oil appearance as "new oil" and a significant difference when compared to the oil on DG1 and DG2 (with centrifuge). The direct benefit obtained on installing CJC® Oil Filters was **savings on the heating**. Also a substantial **drop in lube oil consumption** on the main engines DG3 and DG4 (with CJC® Fine Filters), compared to the consumption on DG1 and DG2 (with centrifuge). Considering the savings obtained and the results gained over a period of more than 12 months, the test has been a success.

Overview Benefits - Reduction in:

- Power to heat the oil
- Lube oil consumption
- Diesel consumption
- Sludge handling
- Emissions

Payback Time:

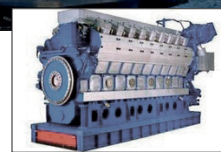
The savings are substantial. With a standard solution, the payback time is less than 7 months, and with the prototype solution, it is a little over 1 year.

ENVIRONMENTAL BENEFITS

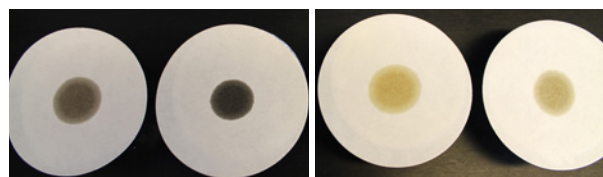
Reducing energy consumption for heating the oil leads to a decrease in diesel consumption and thus lower emissions. Equally, the amount of sludge has been significantly reduced, so less new lube oil to replenish the sump is needed.



Ferry M/F Tycho Brahe from Elsinore to Helsingborg.



Wärtsilä 6R32, Main Engine



Oil samples – Centrifuge Main Engine DG1 and 2

Oil samples – CJC® Lube Oil Filter Main Engine DG3 and 4

RESULT

Main Engine	With Centrifuge		With CJC® Lube Oil Filters	
	DG1	DG2	DG3	DG4
Diesel consumption per hour	0.797	0.588	0.306	0.240

COMMENT

Mr. Henrik Fald Hansen, Senior C/E:

"The installation of the CJC oil filter has been an absolutely positive experience. The quality of the oil is as good as it was before, well, actually better in all aspects. The appearance of the oil has changed from dark to light and looks like new oil. We are saving person-hours and chemicals we used to clean the centrifuge and have less of a mess in the engine room. We are saving on sludge production. The centrifuge is discharging every hour. For cleaning, we use displacement water. The oil loss generated during centrifugation contaminates the water. The formed sludge consists of approx. 0.2 litre of oil (oil loss) and approx. 2.5 litres of water (cleaning) and goes directly into the sludge tank. With 8,700 discharges annually, this corresponds to 1,740 litres of oil and 21,750 litres of water. The costs to dispose of the sludge amounted annually approx. EUR 2,013. On top of that, we are saving a lot of lube oil. The oil loss during centrifugation and when the centrifuge fails amount to approx. 2,500–3,000 litres annually. At the cost of approx. 1.34 EUR per litre, we save EUR 3,356 – 4,027 each year. In all aspects, a good investment, and if we are not switching to battery / electrical propulsion, we will definitely also install oil filters on engines DG1 and DG2."