



CLEAN OIL
BRIGHT IDEAS

Wärtsilä, Main Engine, Diesel Electric Propulsion

CJC™ Application Study

Application Study
written by:

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CUSTOMER

Scandlines, M/F Tycho Brahe, Elsinore-Helsingborg.

SYSTEM

System: Main Engines, 3 pcs. Wärtsilä 6R32
+ 1 pcs. 6R32 (LNE), each 3000 kW
Fuel: MDO, ULSD (ECA operation)
Oil Type: Castrol MHP 154
Oil Volume: 1,200 L

PROBLEM

The M/F Tycho Brahe was using conventional means to clean the lube oil on the diesel electric propulsion units. One centrifuge per 2 engines. The cost of operation for each of the centrifuges amounted to EUR 13,000.- annually totaling EUR 26,000.- The primary cost was for heating.

SOLUTION

On the main engines DG3 and DG4 a **CJC™ Oil Filter HDU 27/108 Standard** and a **HDU 27/108 Prototype** were installed.

The standard filter was fitted on the DG3 main engine and the prototype - using a frequency controller and a higher flow - was fitted on DG4 main engine. The centrifuge was left running on DG1 and DG2 for reference.

BENEFITS

The target was to deliver results equal to or better than the centrifuge. The objective was achieved on both the standard CJC™ HDU Oil Filter and the prototype CJC™ HDU Oil Filter. 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 (centrifuge installations). 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 (CJC Installations), compared to the consumption on DG1 and DG2 (centrifuge installations).

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:

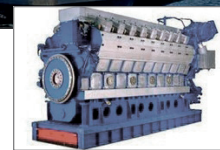
The savings are substantial and with a standard solution, payback time is less than 7 months and the prototype solution a little over 1 year.

ENVIRONMENTAL BENEFITS

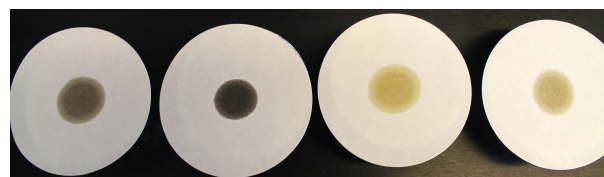
The **reduction in power to heat the oil**, leads to **decrease in diesel consumption** and thus **lower emissions**. Equally, the amount of **sludge has been reduced** significantly. And so has the need for new lube oil to replenish the sump.



Scandlines, M/F Tycho Brahe, Elsinore-Helsingborg, from Denmark to Sweden



Wärtsilä 6R32, Main Engine with CJC™ Oil Filters installed



Oil samples - Centrifuges
Main Engine DG1 & 2

Oil samples - CJC™ Oil Filters
Main Engine DG3 & 4

RESULT

Main Engine	With Centrifuges		With CJC™ Oil Filters	
	DG1	DG2	DG3	DG4
Diesel consumption / hour	0.797	0.588	0.306	0.240

COMMENTS

Mr. Henrik Fald Hansen, Senior C/E:

"The installation 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 man-hours and chemicals which we used for cleaning the centrifuge and we have less of a mess in the engine room. We are saving on the sludge production. The centrifuge is discharging every hour and despite the use of displacement water before the discharge, it uses 0.2 liter of oil which goes directly into the sludge tank. The water volume for each discharge is app. 2.5 liter and with 8,700 discharges annually this corresponds to 1,740 liters of oil and 21,750 liters of water which we annually have to dispose of at a cost of app. DKK 15,000.- (EUR 2.013). On top of that, we are saving a lot of lube oil, app. 2,500 - 3,000 liters annually at a cost of app. DKK 10.- (EUR 1,34) per liter which gives us a saving of DKK 25,000 - 30,000.- (EUR 3,356 - 4,027). Besides this, when sometimes the centrifuge fails, we lose oil to the sludgetank. In all aspects a good investment and if switching to battery, operation is not becoming a part of our future propulsion package, we will definitely put oil filters on DG1 and DG2."