



Hidden Unknowns - Drop in Mechanical Efficiency

World is undergoing a downturn in the economy. In this tough economic climate, Companies are finding ways to trim their trans-fat in realizing savings. Upkeeping of the assets and deriving the maximum efficiency from assets is the need of the hour. In contrary, Tribocare (a leading Fuel and Lube Lab) came across a fuel problem sample from one of its customers who had taken over the vessel from a different Owner recently. Ship consumed the subject fuel. Later, Shipping company approached Tribocare for Technical support as desired RPM was not achieved. Fuel tested was within specification without any abnormality. The subject fuel is not from any problem bunker notorious ports.

The case goes as below:

Vessel departed from a port upon approaching open sea the vessel tried to increase the RPM by increasing the Fuel. The fuel pump mark had reached the maximum as 85mm though the RPM is still 88 to 90 whereas the continuous service rating is 99.9 rpm. Due to high fuel rack mark Fuel consumption had increased drastically to 45.8 Mt/per day. Vessel was facing green seas condition during that time.

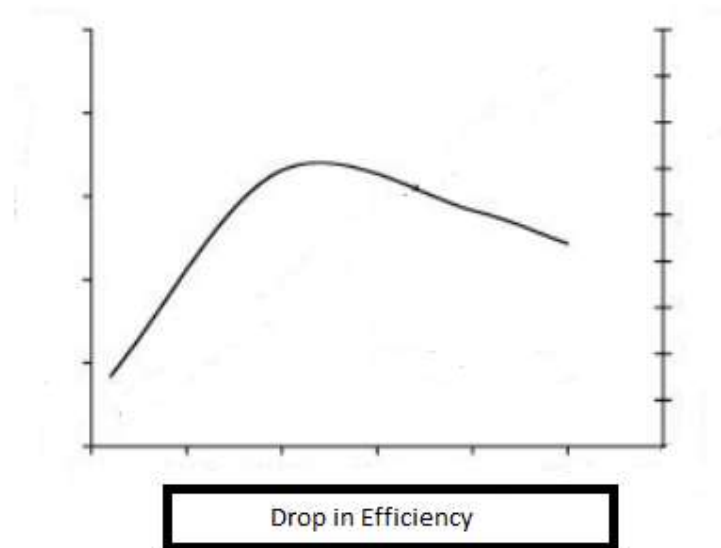
Vessel staff carried out initial checks which includes checking the performance indicator, Vital Engine parameters. Except Main Engine fuel viscosity indicator all other were within normal conditions.

Viscosity was indicating 6 to 7 cst with setting temperature of 70 degC. Ship staff tried reducing the temperature to bring up the viscosity value to 11 -15 Cst but couldn't achieve that as per the C.Eng reporting.

Also, Ship staff thought that fishing net would had got stuck in vessel propeller thus could not achieve the desired RPM. Ship managed to live with that issue and reached a nearby port. Shipping company arranged for underwater diver

inspection in that specific port which showed propeller is free from any obstacle.

Ship left the port and faced the same challenge upon reaching the open sea.



During the sea trail vessel was achieving 99.4 RPM and pump mark was 75mm where Fuel consumption was 42 MT/Day. When benchmarked with the Sea trail, Vessel RPM was 90 RPM with consumption as 45.36 MT/Day with a pump mark of 85mm.

Below Technical probing was done by Tribocare.

Tribocare collected all the info and gave the below recommendations to find the root cause:

1.Viscosity issue:

Only problem cited by the ship staff was desired viscosity could not be achieved. Tribocare advised to check the pneumatic valve that controls steam would had got stuck.

Furthermore, Due to the desired engine injection viscosity could not be attained the fuel would not have gone through the proper atomization in the combustion chamber that would had resulted in poor combustion properties lead to drop in actual power developed.

2.Exhaust temperature:

Viscosity issues should have led to improper combustion in turn resulted in elevated exhaust temperatures. Exhaust temperature should be checked. If possible, smoke from Engine to be observed.

3.Calorific Value:

Fuel calorific value was asked to check to ensure the bunker lifted was less in energy (calorific value) exhibited during combustion.

4.Mechanical output of each unit:

Mechanical output of each unit was asked to check using the indicator diagram To check whether any fuel pump, plunger & barrel type, would had got stuck resulted in drop in the actual power developed by that Unit.

The above were the checks furnished to the vessel in finding the root cause of the problems faced by the vessel. Vessel received the advises and investigation is halfway.

Tribocare offers Fuel testing and technical advisory for the challenges faced due to Bunker Fuels. For any further clarification please contact info@tribocare.com