“Tough boat beaten by small bug…”

The world economy is heavily depending on the maritime cluster and the shipping business to move goods between the producers and the customers around the world in an economically and environmentally sound manner. Ships are getting bigger and time schedules are getting tighter. The offshore industry is moving rigs all around the world and huge ocean windmill farms are being built in Europe, Asia and the Americas. Almost every major operation in these areas often depends upon the reliability of a surprisingly small vessel and her and the crew’s ability to master their task with practically no room for errors. That’s why tug boats are tough boats.

Tug boats are relatively small boats with large tanks and an enormous surplus in the engine room. Easy to understand the need for power when you look at what has to be moved around – often in very narrow waters, inside harbors with heavy traffic and not much space or at sea in severe conditions .

So the engine room hosts a lot of power. Diesel power, mostly. Large engines consume large quantities of fuel, so the fuel tanks have to be big as well. Some larger modern tug boats bunkers up to 200,000 gallons of fuel.

Reliability is the key…

The essential claim on a tug boat is reliability. The tug boat has to perform to perfection. In place and on time. The crew must master their tasks and the boat itself has to deliver the necessary power to move any given object from a to b. This means that engine reliability is essential. Suppose the engine fails. Imagine that for a second. You are towing an expensive oil rig or berthing the world’s largest container ship when the engine fails. Not a nice thought and luckily very rare. Only it happens.

Present challenges on tug boat engine reliability

The most common reason for engine failure is contaminated diesel. The contamination could lead to a large number of problems – ranging from tear and wear, cavitation damages, corrosion, clogged filters and ultimately to a complete engine stop. The contamination of diesel is very often caused by microorganisms – also known as diesel bug. Diesel bug is a result of microorganisms in the diesel. It may be bacteria, yeast, fungus or other, but no matter what they all thrive on organic material (as diesel fuel), moist or water and certain temperatures. All of which are present in the diesel tank of the tug boat.
And even more so when it comes to the use of bio diesel fuels, where you actually add different kinds of organic material to the fuel formula. This may be beneficial to the environment, but adding organic material may influence with the lubricating ability of the diesel fuel and for sure will stimulate the growth of different bacteria in the diesel fuel.
A clean tank and piping system is no guarantee of clean diesel. When bunkering diesel you may in fact take on contaminated diesel. Tests may reveal water content or particle content, but microorganisms may not be revealed by tests. So diesel bug can develop in the tank as a result of moist air, free water in the diesel and high temperatures. Or it can enter the tank via a contaminated filling systems or contaminated land

storage facilities. Once in the tank the diesel bug can be very costly to get rid of, as the following case demonstrates..:

Diesel contamination clogged filters and stopped engine

A tug boat operator experienced problems with the quality of the diesel bunkered in January 2013. Inline filters clogged and lead to a complete engine stop. Experts were called in to look at the problems and discovered that the 92 tons of diesel bunkered were heavily infected with microorganisms.
The tug boat's tanks were emptied into 4 large tank containers and the tanks were inspected by specialists wearing protective clothing. They found the diesel as well as the tanks themselves to be completely bio hazardous – the surface of the tanks was covered by microorganisms. Emptying the tanks took 24 hours. Cleaning the tanks and pipes afterward took two weeks! Simultaneously the diesel fuel was cleaned with additives and the dead organisms were removed, and finally the fuel could be pumped back into the clean tanks. Total costs amounted to more than 200,000 Euros, all of which could have been avoided with a much smaller investment.

Impact of IMO requirements and low sulphur fuels

Tug boat owners and operators also face serious challenges in the future from new demands on diesel fuel quality and engine performance in order to reduce emissions. The challenges could i.e. be addressed with new engine constructions like the common rail diesel or by using low sulphur fuel. Both solutions will enhance the need for absolutely clean diesel fuel. Engine types with high pressure injection systems operate with considerably smaller tolerances and are consequently much more sensitive to even very small particles in the fuel. And the use of low sulphur fuel may reduce emissions but the sulphur content is also an important part of the lubricating features in the diesel fuel, and with less lubrication any contamination of the fuel obviously may cause serious damage to engine parts.

You need to go offline to have completely clean diesel fuel

Most tug boats operate with several tanks with oil centrifuges, water separators and inline filters to clean the fuel before entering the day tank. These measures may – provided they are operated correctly - work to some extent when it comes to the removal of water and smaller amounts of particles but they will have little or no effect on the microorganisms. And furthermore you never actually know the effectiveness of the centrifuge.
In order to have absolutely clean diesel fuel you need to remove all particles, all water molecules and the microorganisms causing diesel bug. The solution is to go offline… You need an offline diesel purifier unit with a large capacity and the ability to remove microorganisms, particles as well as water.

Easily installed and very simple to operate

The Danish company of C.C.JENSEN has manufactured offline oil filter and diesel fuel purifier solutions for more than 60 years and offers a state of the art and well documented solution for clean diesel fuel. The CJC™ Diesel Fuel Purifier is easy to install and is equally well suited for new builds as well as retrofitting. In fact it is possible to install the oil purifier using the pipes and connections from the centrifuge. And furthermore the CJC™ Diesel Fuel Purifier is extremely simple to operate making it the perfect solution in the busy work environment on a tug boat. The oil purifier inserts are also easily replaced and disposed of,

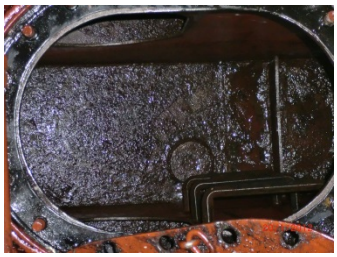
and the diesel fuel purifier will furthermore take away the pressure on the inline filters as well as making a large number of inline filter changes unnecessary.

Large ship owners rely on C.C.JENSEN A/S

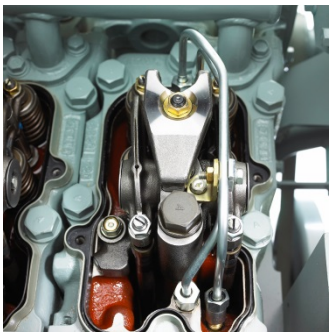
The CJC™ Oil Filters prove their efficiency every day all over the maritime world. One of the world's largest tugboat owners has a CJC™ Diesel Fuel solution on all of their tug boats. Also more than 70 percent of the Danish Fishing Fleet are equipped with a CJC™ Diesel Fuel solution ensuring them clean diesel and reliable engine performance all year round.

For more info on CJC™ Diesel Fuel cleaning and purifying systems, call Kim Kjaer, C.C.JENSEN A/S, Denmark, +45 2222 2967, kk@cjc.dk

The bottom of a diesel tank, heavy microbial growth



Diesel tank contaminated due to dirt, sludge and water



Clean components

Tug Boat with CJC™ Diesel Purifier installed

CJC™ Diesel Purifier