

A FOCUS ON FLEXIBILITY FOR FUTURE FUELS

The principles of protecting engine condition remain unchanged despite the coming upheaval in the marine fuel market, argues **Jean-Philippe Roman**, technical director, Total Lubmarine



Flexibility will be key as ship owners adapt to new fuel choices, says Roman

People tend to oversimplify cylinder oil choices while overcomplicating drain oil analysis. That's one key message from Jean Philippe Roman, technical director of lubricant supplier Total Lubmarine, as he considers the industry's response to the emergence of new fuels - the low-sulphur blends evolving in response to IMO's impending restrictions - and the impact that digitalisation will have on cylinder condition monitoring.

On one hand, ship operators tend to equate low-sulphur fuels with a low base number (BN) lubricant. The reality is more complicated, says Roman: the way the engine is operated will also have a significant impact on BN. On the other hand, he believes that some condition monitoring (and onboard blending) systems introduce too much complexity where simplicity and reliability are needed.

In the interview below, Roman discusses the impact that the 2020 sulphur cap will have on fuel and lubricant choices, the impact of digitalisation on cylinder condition monitoring and future directions for Total's lubricant research.

Q What challenges does shipping's 'multi-fuel' future present for cylinder lubricant providers? How is Total investing in tackling these challenges?

A We have already been in a multi-fuel scenario for several years, but in 2020 we will have to adapt to the technical needs related to the new fuels that will come on the market. Heavy fuel oil will be one of the fuels for compliance, for those fitted

with scrubbers, but we have to address the new low-sulphur fuels on the market with low-BN oils. We also need to consider that there will be more Tier III engines on the market, which have been designed to reduce fuel consumption so are running at higher temperatures and require adapted lubricants. The last configuration is LNG, which will be quite a small proportion to begin with but in my opinion will grow exponentially.

Q What is your recommendation for lubricating LNG engines?

A It's simplistic to talk about base number as only related to fuel type. Yes, you don't need a high level of basicity because there is no sulphur and the risk of corrosion is greatly reduced. But dual-fuel engines work under temperatures that can generate deposits, so if you have a low BN you must bear in mind that you need to bring detergency to keep the engine clean. It is not just a case of BN. The standard is 20-25, although depending on engine conditions the lubricant formulation can be very important for the reliability of the engine when running on LNG.

Q There have been suggestions that scrubber users could even select fuel oils that contain more than 3.5% sulphur. Is this likely and what impact would that have?

A To me it is not very realistic. The refineries are set to produce HFO with a 3.5% sulphur content, and even though we will have some streams with high sulphur content,

the trend will not be to go there. The average sulphur content of HFO worldwide is around 2.6%, so even though the sulphur content is likely to increase in the future for high-sulphur fuel and scrubber users, it will not go to those very high levels.

Whatever the sulphur content will be, we have products in our portfolio that will be fit for these situations. Last year we had a BN140 lubricant approved which might be used in these cases, although the goal of this product was actually to comply with MAN Energy Solutions' Automatic Cylinder Oil Mixing (ACOM) system, which blends low-BN with high-BN oils. But it is approved for standalone use as well in the case of very high sulphur, very corrosive engines.

Q How do you help ship owners managing a very difficult fuel scenario after 2020?

A We have a new BN40 product that is going through the approval process. It is designed for 0.5% sulphur fuel. For regular use of these fuels, the BN40 oil will be fit for purpose. Some engines, because of their technology or because of the way they are operated - the trading pattern for example - might be more demanding or sensitive to corrosion. They might be working at a higher temperature than the average engine. In this case we have a higher BN product with a high content of active matter that can handle the problem of engine cleanliness at the same time as corrosion. This is a way for operators to find the right lubricant if the engine conditions are leading to a particular behaviour in their engine.

The second new product is BN25, dedicated to ECA fuels such as MGO as well as LNG. Both these are under the approval process and will be ready at the end of next year. The main word is flexibility and we have built up our portfolio with this in mind.

Q You already have one highly flexible product, Talusia Optima, which uses a rather different chemistry to other lubricants. What does that new chemistry achieve?

A We have the possibility of a high-BN product without the chemical compounds that might cause deposits in the engine.

With Talusia Optima we have substituted a large part of the calcium carbonate detergent with ash-free neutralising molecules, which bring basicity but with no risk of build-up of deposits. So, when you run on high-sulphur fuel you have enough basicity - it is a BN100 product - and when you run on low-sulphur fuel or even on LNG with no sulphur, you have molecules that are not going to accumulate in the engine and generate deposits, as is the case with conventional chemistry. So it is a very interesting product when you need a high level of flexibility.

Q What approach are you taking to digitalising your monitoring programme?

A Our onboard kits will be changed in a few months' time because we are digitalising this way of controlling cylinder condition onboard. The goal is to help the crews run the test and to be able to check the condition of the cylinders in a very easy way.

From the sampling to the analysis we will support the operator to run the tests smoothly and without errors. Most kits use chemical reagents. In the future we will use different techniques, but the first stage will be to help the operator with a digital tool to implement the process of analysis onboard.

We have not gone the route of providing a very sophisticated product because we think they are disadvantageous. Our view is that it is not necessary to have a very sophisticated and accurate machine onboard. It is more important to have something that is reproduceable, even though it may not be



extremely accurate, and that is easy to handle without calibration and so on.

Q What is your view on blending or mixing cylinder lubricant onboard?

A It is something that we do not support. When we design a lube oil, the specification is defined and optimised for a particular fuel and operating conditions. As soon as you mix lubricants it will not be optimised at all. And if you are adding a package of additives to create a designer product onboard, you are certainly not controlling the overall performance of the lubricant. We think it is more important to control what happens in the engine by monitoring cylinders than to adapt the lubricant during operation.

Q Which areas are you focusing on in your research and development?

A We continue to work on our low-ash chemistry for cylinder lubricants. We have learned enough from the cylinder oil application that we think we can use it elsewhere, such as for trunk piston engine oil. In particular for four-stroke engines, either dual-fuel or fitted with aftertreatment such as selective catalytic reduction. These systems are sensitive to ashes and their efficiency can be significantly impacted. The ash-free chemistry could be useful.

The second axis is to bring a contribution from the lubricant to minimising CO2 emissions. That means reducing fuel consumption by creating a fuel economy product. We have knowledge of this from land applications. We were the first to have designed a fuel economy trunk piston engine oil for engines operating heavy fuel oil. We are conducting experiments to show that we can implement fuel economy while maintaining high reliability of the engine. In the future this will be a very strong area of development for marine cylinder oils.

■ Two new products will complete Total's Talusia cylinder lubricant range by 2020