

# Automatic engineering

*Kittiwake tells Bunkerspot that its LinerSCAN – the world's first real-time alarm system for engine liner wear – will help prevent critical engine damage, and offer shipowners the chance to save on lube oil costs*

**I**n an era of high oil prices and environmental anxiety, shipowners are facing untold pressures – from spiralling costs to increasing maritime rules and regulations.

Anything that can trim lubricant bills, or extend engine life in these trying times, is almost worth its weight in gold. Maximising vessel performance becomes an even higher priority under such circumstances, where reliability and durability can result potentially in savings worth thousands – or even millions – of dollars.

**Kittiwake** has for years provided the industry with innovative ship-based solutions to help onboard engineers monitor and test fuel, lubricant and water conditions to achieve better operational performance.

These critical fluid test kits, developed using patented Kittiwake technology, have pioneered machinery condition monitoring at sea, enabling engineers to check fuel and lubricant conditions and take remedial action where necessary at short notice.

In the past, this kind of precision analysis was confined to shore-based laboratories. Detailed testing of liquids on any vessel required samples to be packaged and then sent away with results returned typically after a period of weeks or perhaps months.

'In today's ultra competitive environment, ship operators cannot afford the luxury of this time,' says Kittiwake's marketing manager Paul Froome. 'This is where onboard testing and analysis comes in. The reality is the sooner the engineers have the results in their hands the sooner they can take decisive action. By the time lab results come back it may be too late.'

## Protect and serve

The latest innovation from the Kittiwake stable takes the concept of onboard testing one step further. Its *LinerSCAN* product is the world's first real-time liner alarm, providing an early warning defence against scuffing, liner wear and catalyst fines, all potential sources of engine failure. The system is fully automated and delivers online, real-time information to engineers on these critical issues immediately.

The groundbreaking technology uses magnometry and incorporates sophisticated reporting software to generate data and an

alarm system to alert engineers to potential sources of danger. *LinerSCAN* builds on Kittiwake's own *ANALEXrs* Total Ferrous Sensor monitoring technology but includes improved accessories and software.

The company launched the product commercially in mid-2008, although *LinerSCAN* has been successfully trialled at sea for more than three years. The technology is now in commercial operation on container vessels and bulk carriers. Current installations include many types of engine varying from six cylinders to 10 cylinders. A number of shipowners already using *LinerSCAN* intend to roll out the technology across their fleet. The monitoring system is easy to install and commission, and fits snugly with existing equipment, requiring minimal storage space.

'Monitoring engine liner wear is critical to the health and performance of any modern vessel,' said Froome. 'With *LinerSCAN*, operators and engineers now have a first line of defence. The system can alert them to possible sources of danger, in real-time, allowing them to act at the earliest opportunity.'

Tackling engine liner problems before they undermine vessel performance can mean potentially huge cost savings, a vital consideration for owners and operators. A single liner failure can cost hundreds of thousands of dollars in parts, repairs and off-hire costs, possibly more. The average insurance claim for an unexpected liner loss is over \$250,000.

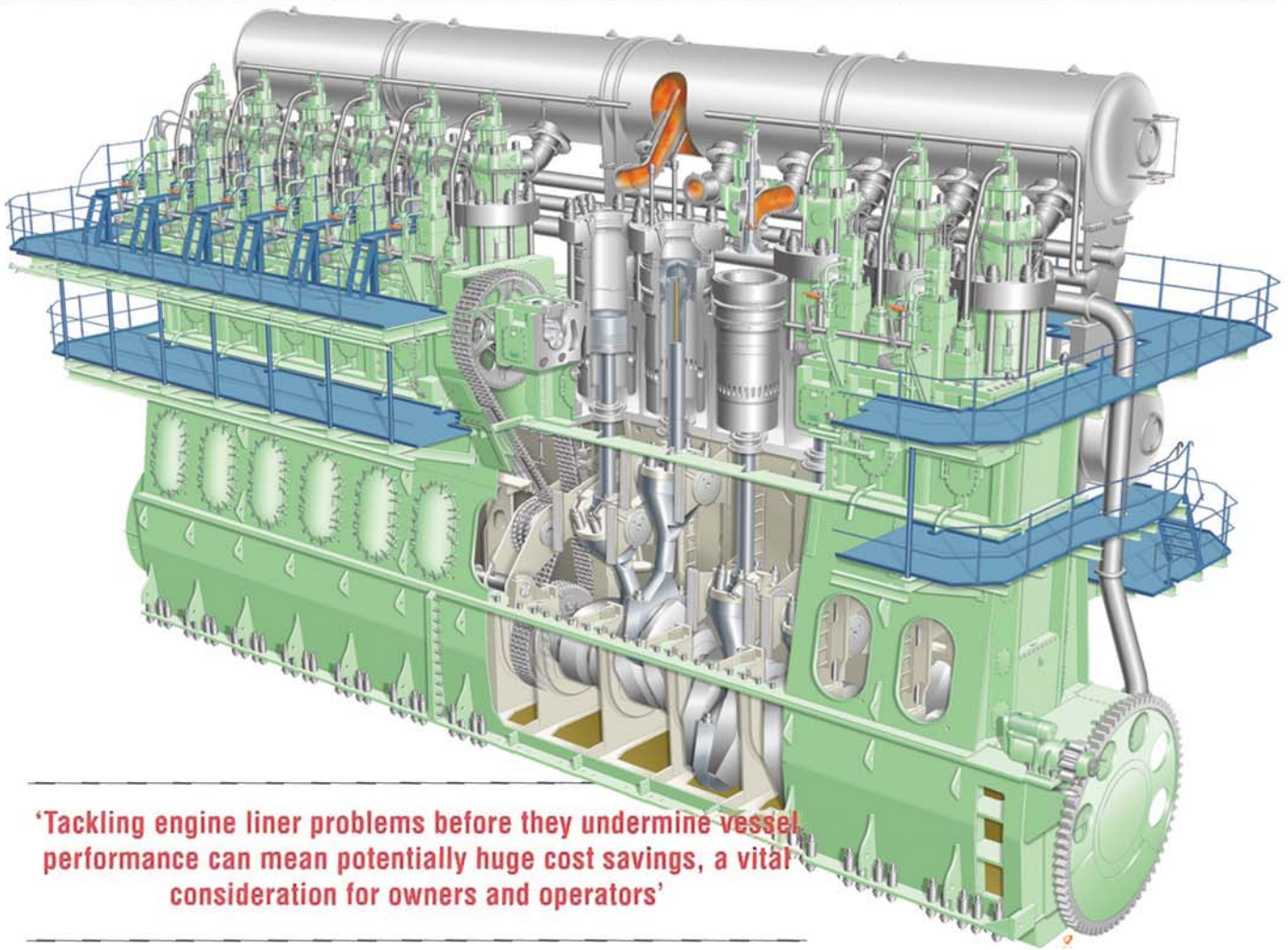
Wear is very much related to engine parameters, such as speed, load, cylinder lubricant feed-rate, temperature, fuel and lubricant quality, and issues can arise suddenly. With *LinerSCAN*, scuffing can be seen not just a few hours before there is serious damage – the first unmistakable signs can be seen very often up to a few days before.

## Fuel and lube oil issues

Amid concerns of deteriorating fuel quality, the need for precise and immediate engine liner data becomes paramount, says Kittiwake application engineer Tom Kent.

'There is a reported increase in harmful catalytic cracker (cat) fines as a result of the blending process,' he says. '*LinerSCAN*

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picks up the ingress of fuel cat fines in real-time allowing preventative measures to be taken before extreme wear of engine liners is realised.'

Although damage prevention is critical, the original reason behind the LinerSCAN project was to help vessels use less engine oil. Engines are regularly over lubricated to try to avoid problems like scuffing. This practice can sometimes have the opposite effect and lead to problems such as bore polishing and also high lubrication costs. An average container ship can spend \$20 million on cylinder lubrication in its life.

The real beauty of LinerSCAN, says Kent, is that its use is not solely limited to the prevention of engine damage. Constant real-time monitoring gives engineers a vital tool in maintaining and optimising lube oil requirements, a huge cost saver.

On any ship, the optimal feed rate for oil is not fixed. It is dependent according to trade, load, running hours and many other factors, many of which are unknown. With LinerSCAN, the engineer just reads from a monitor how the engine is lubricated at any given time, there is no need to take additional oil samples.

'LinerSCAN helps reduce cylinder oil feed rate to the optimal value, thereby reducing the cost and potential problems

from liner lacquering or bore polishing due to over dosage of the cylinder oil,' says Kent. 'Our system typically means that you can use less oil.'

This is welcome news in an age where oil, regardless of its form, does not come cheap. Field trials over the past three years have at times decreased main engine oil lubricant usage by up to 50%. Ignoring all other savings, an extremely conservative 5% reduction in lubricant usage will pay back investment in months.

'No other system gives you this level of confidence in your real-time feed rate alterations,' says Kent. 'Likewise, no other system can help you achieve this reduced lube oil consumption without compromising manpower or using laboratory analysis.'

#### Unknown territory

Aside from cost savings and the obvious safety benefits – a liner going down at the wrong time could be extremely hazardous for any vessel – the new Kittiwake system comes at a time of increasing environmental anxiety.

Environmental changes influencing the use of fuels could also pose a threat to marine engineers charged with monitoring engine performance. In these cases, LinerSCAN can again perform a valuable role, especially

in such a changeable backdrop.

Changes in the fuel sulphur level, for instance, could potentially impact on the engine liner and ultimately the performance of the vessel. 'Sulphur is a major contributor to the surface finish on the liner and its absence is unknown territory,' says Kent. 'Couple this with the changes that will need to be made to the oils' base numbers and ship's engineers will be continually learning.'

Europe already has its first Sulphur Emissions Control Areas (SECAs) in the North Sea, English Channel and the Baltic Sea, while other areas such as the United States look set to follow suit. This could see fuel sulphur content slashed from 4.5% in most places down to 1.5% and then 1.0% by 2010, and even 0.5% further on the horizon.

The message is to expect surprises as more changes are made. Slow steaming, driven by the **International Maritime Organization (IMO)** and the drive to cut fuel consumption, could throw up more complications. 'Again, ships are heading into less well known territory,' says Kent. 'It's not just a matter of slowing the engines down. For best efficiency, the timing, fuel pumps, and turbochargers all need to be matched to this new condition.'