MEASUREMENT & ANALYTICS

NSB's large container vessels successfully running with Cylmate Engine Monitoring systems

A continuous success story about M/V Ever Conquest and M/V Ital Contessa.

Measurement made easy

Background
In 2003, the German shipping company NSB carried through a Cylmate® test installation on one of their container vessels, M/S Hanjin Ottawa. This test resulted in very good feedback, highlighting the potential and the benefits with a continuous monitoring system. Due to Cylmate's permanent monitoring functions, NSB was, within a short period of time, able to detect two defective injection valves as well as an emerging leakage of an air spring chamber piston of the exhaust valve. This manifested Cylmate's ability to, at any load, detect small deviations before they have escalated to serious problems.

This positive experience with a continuous monitoring system have resulted in many Cylmate systems installed in the NSB container vessel fleet.

What are the main benefits with the Cylmate system?
We ask Mr. Bögemann, Chief Engineer onboard M/V Ever Conquest:
"Before Cylmate we had movable monitoring systems and it took us just about an hour to measure all cylinders. Since Cylmate is a continuous, on-line system it is a very helpful tool in our daily work. We can see the condition inside the cylinders and before something serious happens get an early warning, a very good pro-active function in Cylmate."

"With the very good experience of the Cylmate system I certainly rely on it for condition-based maintenance on injection and exhaust valves."

Several times per day, me and my crew look at the Cylmate-screen and the most important and frequently visited pages are mainly these three:

- Engine Main Data, showing numerical values of Pmax, Pcomp, MIP and so on.
- Cylinder Pressure P/fly wheel, which shows each pressure curve.
- Cylinder Pressure P/crank angle, where you can compare two or more pressure curves between selected cylinders. A very useful page.

"In general, it is very easy to navigate in the Cylmate system and I think there is a good level of information available."

"In order to better utilize the system NSB has Cylmate training arranged via NSBacademy in Buxtehude. A good initiative for learning more about the system."

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01 M/V Ital Contessa.
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02 2-stroke, 12-cylinder large diesel engine.
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03 Mr. Bönninger, Chief Engineer onboard M/V Ital Contessa.
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04 Mr. Bögemann, Chief Engineer onboard M/V Ever Conquest.
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05 Onboard M/V Ever Conquest.

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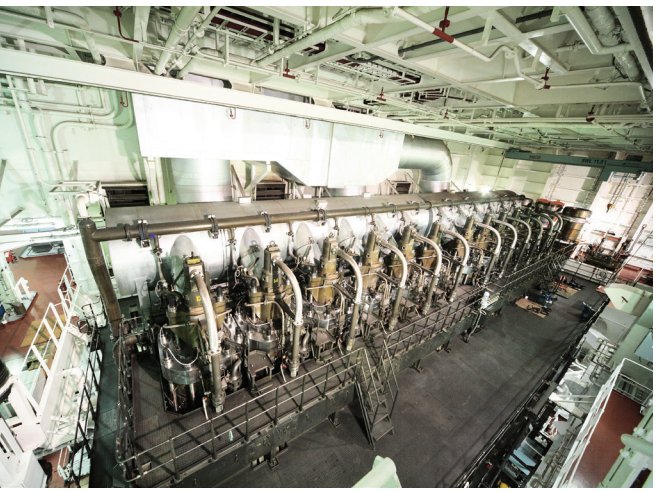

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Mr. Bönninger, Chief Engineer onboard M/V Ital Contessa adds his opinion about the Cylmate system: “With some years experience working with the Cylmate system onboard our vessels I really trust its high reliability and accuracy.”

“I like to have the deviation graphics always displayed on the screen, which indicates any changes in any cylinder performance. The software has excellent functions for fault tracing and performance analysis.”

“Besides the combustion performance I can judge the quality of compression. With the very good experience of the Cylmate system I certainly rely on it for condition-based maintenance on injection and exhaust valves.”

M/V Ever Conquest and M/V Ital Contessa's 12-cylinder main engines are optimized and continuously monitored by ABB's Cylmate system.

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Company profile – NSB shipping company
NSB Niederelbe Schiffahrtsgesellschaft mbH & Co, KG (REEDEREI NSB). We really get things moving on the "highways" of international maritime traffic. And in the process we always follow the same principle: "Quality Made in Germany".

With a strong fleet and a range of modern services going beyond mere ship management, we are one of the leading container shipping companies in the world today.

On a daily basis around 6 million containers are transported by sea worldwide. As one of the leading providers of tramp tonnage in the container segment, we have a considerable share in this with our vessels. With capacities ranging between 1,000 and 11,500 TEU we reach a total deadweight tonnage of more than 2.7 million tdw with an overall TEU capacity of approximately 220,000 TEU. In addition we also manage tankers as well as offshore jack-up vessels.

Thanks to the know-how of our nautical and technical superintendents, who possess longstanding experiences on board and ashore, we support the seafaring location of Germany. In this way customers can trust in reliability, efficiency and innovative strength "Made in Germany".

It is also important for us to ideally combine economic success and sustainability.

For more information visit:
www.reederei-nsb.com

Facts on M/V Ever Conquest and M/V Ital Contessa	
Length over all	333 m
Registered length	320 m
Registered breadth	42 m
Tonnage depth	24 m
Draught	14 m
Gross tonnage	90449
Net tonnage	55452
Capacities	
Number of 20 ft containers	8100
Number of 40 ft containers	3985
Reefer in hold	200
Reefer on hatch	500
Main engine	
Manufacturer/Model	Sulzer 12RTA96C-B
Type	2-stroke
Power	68640 kW
Main engine rated speed	102 rpm

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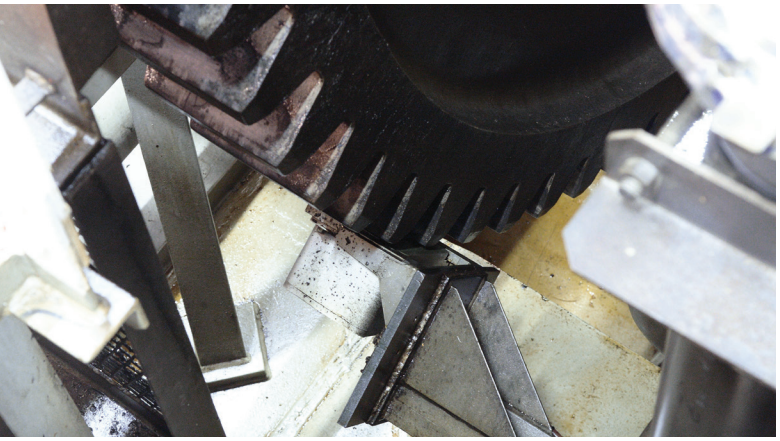

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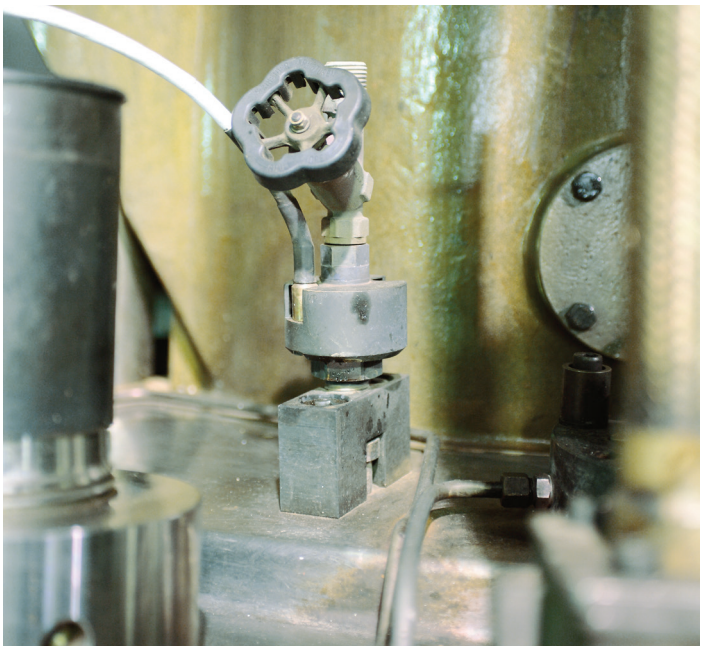

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01 Cylmate screen with engine data.
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02 Angle transducer at the engine flywheel.
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03 Cylmate pressure transducer PFPL203.

Cylmate system is designed to withstand marine environmental conditions and fulfills the requirements according to the main classification societies. The combustion pressure is measured in each cylinder, continuously and in parallel, while the engine is running and under all load conditions.

The Cylmate analysis and monitoring functions mean that the risk of mechanical or thermal overloads of specific cylinders or the engine itself can be avoided. Further, the cylinder conditions can be optimized and the engine can easily be balanced and tuned in order to improve the running performance. The Cylmate system gives the possibility to minimize the fuel consumption and emissions as well as carrying through condition-based maintenance, which will result in a short payback time.

The Cylmate system consists of a pressure transducer on each cylinder and an angle transducer at the engine flywheel, which all are connected to the Cylmate transducer bus. The controller collects all measured data within each engine working cycle via the Transducer Bus. A built-in mathematical engine model computes, in real-time, the crank shaft deflection in order to get the correct TDC angle and piston position of all cylinders.
All combustion parameters such as Pmax, a-Pmax, Ptdc, MIP, Indicated Power and so on, are logged and monitored for each stroke and can be shown in trend diagrams.

Any deviation from normal performance will be presented as an alarm. Evaluated data, alarms and events are transmitted via Ethernet to the Cylmate operator station as well as to superior systems, if connected.

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