

# EXTENDING THE SERVICE LIFE OF ENGINES

Following the demonstration made by **XBEE Enzyme Fuel Technology** of its ability to reduce greenhouse gas emissions in late 2006 and early 2007, Brittany Ferries continued to treat the heavy fuel oil 380 of their ship *Mont Saint-Michel* in order to observe the technical impact.

Indeed, enzymes contained in **XBEE** have the exceptional function of naturally cleaning fuel systems: from storage tanks to settling tanks, to centrifuges and daily tanks, to engines.



On January 8, 2008, after fifteen months of continuous operation with **XBEE** HFO, the ship entered the Remontowa shipyards in Gdansk, Poland, for her first service after thirty thousand hours of work.

## Natural and constant cleaning

Right from the start of the technical maintenance, the engineer in charge of the inspection for MaK Méditerranée, Axel Hausmann, noticed the absence of carbon deposits or lacquering on the piston heads.



# Natural and constant cleaning

The following comments are extracted from the maintenance report signed by Axel Hausmann and Benoît Vrignaud:

*"We found the [cylinder] heads in a very good shape. All heads were submitted to crack tests; no cracks were found."*

*"The cylinder liners were in very good conditions. After intensive cleaning we found back the original honing surface. The polishing rings showed no wear, so they were put back in place."*

*"Another, very positive impression was given by the pistons. We found no burning on the combustion side of the crowns. The rings were still in good conditions and we didn't find any deposit of carbon or lacquering on the inner cooling surfaces of the crowns."*

*"We controlled two main bearing shells of each engine and decided to keep all main bearing shells in place for again 12.000 running hours."*



## Natural and constant cleaning

These findings are in fact only a visual translation of what the various emission measurement campaigns had already precisely quantified: a significant increase in Oxygen ( $O_2$ ) and a very substantial reduction in Carbon Monoxide (CO) by more than 30% reveal a better combustion.

This is further confirmed by another measure: the reduction of particles emissions by -47.5%.

