Vessel performance analysis – beyond mere monitoring of conditions

When the steamship M.S. NORDEN, a 1,400 dwt vessel was launched into the River Clyde at Glasgow, Scotland, in 1872, it is doubtful if Mads Christian Holm, a former ship’s carpenter and founder of Dampskibsselskabet NORDEN A/S, would have envisaged his Company’s development 137 years later. Today it has 216 employees at its offices in six countries, and some 400 officers and seamen working on Company owned vessels.

The Danish shipping Company is operating 170 dry cargo and tanker vessels, and has 36 new builds, and 43 long-term charter vessels awaiting delivery. With 79 of these designed for dry goods, the Company is currently operating in a difficult market. From a peak in June 2008, the Baltic Dry Index had, during December of that year, plummeted by 94 per cent. Not since 1986 has the Index, which measures changes in the cost of transport raw materials, been so low.

Fortuitously, Dampskibsselskabet NORDEN has equipped its vessels to provide the details needed to operate the ships for optimum fuel economy, and at the same time provide valuable marketing information. During 2007 it contracted three tankers as a pilot to Propulsion Dynamics’ Computer Analysis of Ship PERformance (CASPER®) programme. The results were sufficiently impressive for the Company to assign an additional 15 vessels on the programme for 2008. The extended contract was renewed for 2009.

Speaking to Brian Warshaw, Jens Christensen, vice president and deputy in the technical department, explained some of the ways that Dampskibsselskabet NORDEN was able to use the information provided by the programme. ‘We have a ship going to one of the oil companies for a one year time charter, and just this morning I was able to take out the charts and review the graphs to see the consumption at various speeds, and how they compared to the charter agreement. This particular vessel is due to go into dry dock within a month, where the hull will be repainted to improve the smoothness, and the performance of the ship. As we have seven of these sister ships, we are able to compare their peak consumption performances.’

‘In December last year we had a tanker that was showing a lot of hull resistance, which meant that if we had to achieve certain speeds to fulfil the contract, the bunker consumption gradually crept upwards. It went into dry dock, and when it came out we were able to evaluate the results, and see just how well we had spent the money at the shipyard.’
‘As part of our 14-point environmental programme to reduce carbon dioxide (CO2) emissions, Dampskibsselskabet NORDEN has a policy that every five years a vessel’s hull is given a full shot blast. Obviously we expect to see an improvement indicated on the first CASPER® report received following the vessel’s return to service. The Propulsion Dynamics’ reports are really a tool where we can check that what we are doing is really working.’

Christensen said that the Company was learning from the CASPER® results. About six months ago they had propeller cleaning done on one of the ships, and were disappointed not to see an improvement in performance. After some intense discussions with Torben Munk, the founder of Propulsion Dynamics, it was determined that they needed to be more precise when specifying the type of propeller polish. Dampskibsselskabet NORDEN now ensures that it always requests a super-polish. ‘We had a really good dialogue with Propulsion Dynamics, and as a result we are spending our money more wisely,’ said Christensen.

Propulsion Dynamics’ Business Development Manager Daniel Kane, said that the CASPER® service does not require the procurement of software or instruments, yet is compatible with all onboard monitoring and data recording systems. ‘Through the CASPER® service,’ he said, ‘we retain the worlds largest repository of processed service performance data for all tanker types, from Handy size to Ultra Large Crude Carriers. In this way, we carefully process the stated trial trip performance of the tanker, and then through the acquisition of recent performance data, are able to calculate the ship’s added resistance. Each ship is treated in an individual manner, rather than making theoretical assumptions about performance behaviour.

‘Added resistance is independent of speed, weather, and draught,’ he explained. ‘The programme reveals the precise performance losses due to hull and propeller condition. It also lends itself well to the first of its kind CO2 operational index that takes into account hull and propeller condition. We also offer benchmarking, so that our customers can have an indication of how their hull and propeller condition compares to similar ship types.’

Dampskibsselskabet NORDEN A/S

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