

The Bellona Foundation, an environmental NGO and a member of the Clean Shipping Coalition, in cooperation with the Norwegian coating manufacturer Jotun, convened a workshop in Oslo in January 2013 to explore the realisation of a reliable and transparent hull and propeller performance measurement standard. The invitation-only event included participants from a broad spectrum of stakeholders, including standards organisations, class societies, performance monitoring companies, marine institutes, coating manufacturers and shipowners.

The workshop was nevertheless viewed with scepticism by some. "The development of such a means of evaluating a coating should be for the benefit of shipowners and operators and should definitely be in the hands of completely independent and disinterested parties with funding, support, supervision from shipowners and operators and governments," says Boud Van Rompay, CEO of coating manufacturer, Hydrex. "Not from paint companies trying to sell their particular brand of paint." Van Rompay believes the only participation paint companies should have is to provide their product for evaluation and ensure that it is properly applied and used according to their specifications. Then wait for the results.

Boud Van Rompay



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He argues for a holistic approach and believes any evaluation of a hull coating system must take into account environmental safety, full life cycle fuel efficiency, required maintenance and the entire cost of the coating over the service life of the hull. Additionally, whether or not the hull coating system lends itself to prevent the spread of invasive species should be considered, and this depends to a large degree on whether it can be cleaned frequently in the water without damage to the coating or hazard to the environment, says Van Rompay.

According to workshop attendee Christian Brøbeck, CEO of hull and propeller performance monitoring system supplier Propulsion Dynamics Europe, there may be competing interests as the introduction of regulations and standards could see more business for coating suppliers and suppliers of performance monitoring tools. "For many years, very few paid attention to us. We were one company saying: here's how much speed your ship has lost because of the combined effect of basic hull roughness,

Hull coating performance standard gains momentum

There may be a benefit for both shipowners and suppliers in establishing a global standard for measuring how hull coatings affect vessel performance, but it is going to take time to achieve, says **Wendy Laursen**



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propeller fouling and hull coating performance. Nowadays we can distinguish between basic roughness and fouling. Furthermore hull and propeller performance monitoring is a household word in the maritime industry, and we are happy to participate in these workshops."

Jotun, a co-convenor of the workshop, supports the initiative too. The company offers a hull performance solution that is based on its SeaQuantum X200 coating and a reliable and transparent method for measuring the impact of antifouling on ship performance with a no-cure-no-pay business model.

In a white paper *The illusion of fuel savings – an urgent need for improved transparency in marine hull coatings* published in 2012, Jotun's global sales director for hull performance solutions, Bjørn Wallentin, describes how he sees theoretically possible

performance being emphasised over true performance measures of coating performance. An example is the energy efficiency design index (EEDI) developed to put focus on improving the performance of new builds rather than being representative of actual long term environmental performance. "The biggest potential in reducing fuel consumption and emissions lies within the existing fleet of vessels – incentives to reduce their carbon footprint by using higher quality antifouling, proven by a fully transparent hull performance method, would have immediate positive financial and environmental effects."

When fuel savings are promised in conjunction with hull coatings, the proof should be based on operational data between dockings and should not include the benefits of surface pre-treatment during docking, says

Mr Wallentin. Even though he concedes that vessel sensor data can be used to support almost any conclusion, Mr Wallentin states that data availability at least gives the opportunity to analyse changes made to coatings and he believes incentives should be made available for all vessels to log appropriate data.

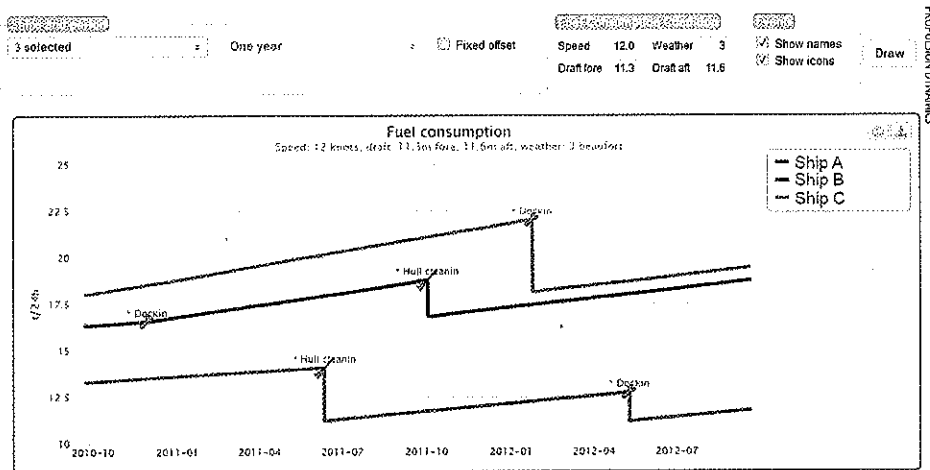
Fuel consumption analysis supplier Eniram published *Study of Hull Fouling on Cruise Vessels Across Various Seas* in 2012 and the report cites many examples of the value of such data including the difference in fouling rates experienced in different regions. The value of on-going monitoring was also demonstrated by a vessel which experienced a rapidly accelerating growth in fouling after hull cleaning. Power consumption increased by nearly 4% over the following three months suggesting that brushing had damaged the anti-fouling treatment.

EVALUATE CLAIMS

The conclusions drawn from performance data need to be carefully considered though, as Mr Wallentin suggests. An examination of the different tools available highlights some of the issues to be considered. Bureau Veritas offers the SEECAT software as a way of calculating ship energy efficiency that can also be used to evaluate the claims of coating manufacturers. Typically, they promise fuel savings of around 5%, says marine environmental leader, Martial Claudepierre. "But you don't know if this is applicable to your own ship because all ships are different," he says. "It is very difficult to see what the real reward is. You don't know, for example, if the gain is from the painting itself or because the drydocking has enable you to also clean your propeller." SEECAT discriminates between these two factors and can also take account of other energy saving changes such as the de-rating of engines.

Kevin Logan, president of Macsea, a company that supplies the software system Hull Medic, points to modelling limitations that can affect the accuracy of coating performance calculations. For example when calculating resistance, the interactions between factors are often ignored as are ship model scaling effects when using tank test data in baseline calculations. Hull Medic's approach is to collect lots of ship performance data so a large statistical sample can be used. The data is normalised by removing statistical outliers so that the effects of wind, waves, water depth and other variables are removed from the on-going analysis. "The unique feature of Hull Medic is its high accuracy. This means we can detect ship underwater hull fouling at the earliest possible time," says Mr Logan. Optimal hull cleaning intervals can be determined and coatings compared.

Propulsion Dynamics takes a different approach with the Casper service. Some monitoring companies sell instruments and use normalisation rather than correction factors, says MD Christian Brøbeck. Casper does not need any additional software or hardware, rather it uses full correction factors for wind, waves, sea current, draught/trim and fuel quality. The company believes including the outlying data improves the accuracy of speed and power predictions since adjustments are made in the full range of ballast



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and laden conditions as well as slow speeds up to design speeds and weather from BF0 to BF7.

"How we are different is we tell shipowners not only how much speed you have lost since last docking (or since sea trials), we tell them if you clean the hull and/or propeller today, you will save X amount of fuel for any speed, weather and draught. This is a little more advanced than plotting trend lines to see speed loss percentage because speed loss is made up of not only basic hull roughness (due to repeated spotblasting) but also fouling of the hull and propeller that can be remedied through in-water husbandry," says Mr Brøbeck. "In addition, we are telling the shipowner how his hull/propeller condition compares anonymously to other ships of the same time. This is desired for the charterer who takes hull performance seriously and wants to establish a hull/propeller performance rating system of the chartered-in fleet without the need for additional software or hardware."

Mr Brøbeck doesn't believe that IMO will dictate a mathematical formula that shipowners must adhere to for hull performance calculations. They are more likely to leave that to the shipowner so long as they have a monitoring system that can benchmark performance. In any case, development of such a guideline or formula should be dictated by consensus of the stakeholders which takes time.

For the Bellona Foundation the workshop was a

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way forward for improving the environmental performance of shipping. The organisation first presented a concept for a hull and propeller performance measure to IMO in February 2012 by document MEPC63/4/8 and was further elaborated in later that year by document MEPC 64/INF.23.

"We are not advocating regulation," says Svend Søyland, senior advisor with the Bellona Foundation. "What we aim for is an agreed-upon way of measuring hull and propeller performance, and we consider the development an international standard to be the best way of achieving this. It may have different subsets or tiers to cover different needs: Tier One with higher general applicability but lower accuracy, Tier Two that will fulfil the needs of in-company learning and Tier Three that will be accurate enough to be the basis for performance-based contracting."

WORKING DEFINITION

"Measurement of hull and propeller performance has been a very contentious issue within the industry," says Mr Søyland. "The aim in this first workshop was to bring the major stakeholders together, and in the spirit of mutual respect for differing positions on this issue, to seek to identify areas where agreement still could be reached. While, further refinement is needed, the workshop participants were able to converge on a working definition of hull and propeller performance as well as a set of guiding principles for work on such a standard."

According to Mr Søyland, the Bellona Foundation has found that "the best way to identify viable environmental solutions is in open dialogue with all affected stakeholders".

The Bellona Foundation will convene a follow-up workshop in London in the first week of May where observations from the Oslo workshop will be fed into a wider dialogue with all stakeholders interested in contributing towards the establishment of a transparent and reliable standard for measuring hull and propeller performance. The organisation will also submit an update to the IMO MEPC meeting in May 2013.