GreenTech 2015

The shipping industry plays a critical role in the global economy, accounting for the transport of upwards of 90 per cent of all the world’s traded goods. Unfortunately, it also accounts for 3, 15 and 16 per cent of the world’s emission of carbon dioxide, nitrogen oxides and sulphur oxides, respectively. On 27-29 May, our media partner Green Marine hosted marine transportation enthusiasts from industry, policy and academia in Seattle, USA, for GreenTech 2015 to discuss how they are improving the shipping industry’s sustainability and reducing its carbon footprint. *International Innovation* provides a peek at the new types of technologies and designs that were showcased at the conference

**FUEL CONSUMPTION MONITORING**

Fuel consumption monitoring informs the crew how changes in throttle settings, weather conditions, barge configurations and any potential resistance affect fuel consumption. Once a system is installed, fuel data can be combined with data from a GPS, the engines, weather reports and other sources to create synergies that would not otherwise be possible. This enables operators to test and analyse their operational strategies. Fuel consumption monitoring system owners have reported fuel savings of 2 to 10 per cent.

**HIGH EFFICIENCY NOZZLES**

Reducing fuel consumption reduces local emissions from tugs, as well as fuel transportation emissions in larger ships. High efficiency nozzles are one way of improving fuel consumption rates. Installing such nozzles can significantly increase the zero-speed bollard pull and the available thrust over the entire operating speed range. Moreover, they can provide greater thrust with the same power, or the same thrust with lower power.

**HYDRAULIFT SKEGS**

Another method for minimising fuel consumption of barges lies in the use of hydralift skegs. Most of today’s barges feature raked sterns that are fitted with two large skegs on each side to help them track straight when they are being towed. Hydralift skegs increase the lift-to-drag ratio, thus improving fuel consumption efficiency during the towing process. These skegs have the potential to reduce the barge resistance by up to 20 per cent.
MEMBRANE SCRUBBER

Scrubbing technology entered the marine market in response to concerns over acid rain and particulate matter pollution from ship exhausts. Traditional systems use an alkaline scrubbing water and pass the exhaust through a spray or bath to convert it to sulphates and sulphides that remain in the fluid; however, there are lingering concerns that this may be harmful in the long term or in large concentrations. Some corporations are currently working on bringing scrubbing systems to the market that have zero discharge. These systems will eliminate the need to expose the scrubbing medium to gas directly and will use a containment system to dispose of the captured sulphides.

HULL OPTIMISATION

Improved hull design has the potential to decrease fuel consumption of marine vessels by 10-20 per cent. The optimal shape for the hull will depend on the ship in question, but a typical optimisation process using computational fluid dynamics can provide an analysis of thousands of hull forms, resulting in designs that provide significantly reduced resistance compared to the baseline hull.

TRIM OPTIMISATION

The vertical distance between the waterline and the bottom of the hull is the draft or draught of a ship. From this, mariners can measure trim – the difference between the forward and aft drafts. Ship trim optimisation has risen in popularity as an effective operational measure to improve energy efficiency by reducing the resistance a ship experiences when moving through the water. As a result, trim optimisation also reduces fuel costs as well as emissions of carbon dioxide, nitrogen and sulphur oxides.

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