Will EEDI become tighter?

The IMO Energy Efficiency Design Index (EEDI) came into force in January 2013. The purpose was to promote energy efficient ships and thereby reduce CO_2 emissions, but it now seems that not all the ships built based on EEDI are optimal when looking at the big picture.

The Energy Efficiency Design Index (EEDI) is a mandatory design method for new vessels above 400 GT. The intent is to reduce CO_2 emissions by regulating the installed propulsion power of new vessels with considerable conversions. At the moment, ships with icebreaking capability of more than one metre and ships with diesel-electric propulsion are excluded from EEDI requirements. However, there are currently no clear regulations on how the icebreaking capability of one metre can be verified.

Results from EEDI

Now that EEDI has been in force for three years, results are beginning to show. For container ships the solution to fulfil EEDI has been slow steaming with hull modifications, i.e. reducing speed and increasing of ship size. Thus, new container ships are getting bigger and slower than before. For other ship types, this solution is not always an option. For instance ice going vessels, which already move slow in ice, reducing speed is not possible or they might get stuck in ice. Cruise ships and ferries often have a daily schedule they need to keep, which means they cannot sail slower.

Based on the experience so far, it is easier for smaller vessels to meet the current EEDI requirements.

"If this phenomenon continues, it may increase the number of small ships at the expense of larger vessels, and bring an overall increase in the CO_2 emissions in comparison to a situation in which the same amount of cargo is transported with larger vessels," says sales and marketing manager Arto Uuskallio.

There is also political pressure to move on to phase two and three of EEDI regulation – and possibly to phase four, which would mean even tighter regulations for individual vessels, but not necessarily reduced overall emissions.

Optimal cargo flow

Given this situation, the Finnish Transport Agency and the Board of Winter Navigation have begun studies to gather information about the vessels built in phase one of EEDI, so as to evaluate how phase two and three of EEDI could be implemented. Scenarios will be built up regarding the cargo traffic in the Baltic Sea in order to evaluate the optimal amount and sizes of vessels needed for total cargo flow. As a result, emissions of both individual ships and total cargo traffic will be compared. Aker Arctic is participating in these studies.

Smaller vessels can easier fulfil EEDI rules. However, when the aim is to reduce CO_2 emissions, total cargo amounts to be transported have to be taken into account.

"EEDI regulations were based on vessel statistics," Uuskallio adds. "The challenge in gathering statistics regarding the Baltic Sea was, that there were not always enough vessels to get statistical relevance, and certain categories were based only on individual vessels. In some cases this might have been a special vessel with special solutions, and as such not a good representative of that vessel category."

Another challenge with EEDI is that it is somewhat contradictory to the goals of the Finnish-Swedish ice class rule with minimum power requirement, which needs further studies.

Additionally, the aim with the current studies is to clarify how to verify the EEDI compliance of high ice-class vessels. Open water vessels are currently verified through calculations, model tests and full-scale tests during the design and construction period. "A corresponding process would be appropriate for high ice class ice vessels too," says Uuskallio.