Focus on the prop!

Few existing ships' engines today are running at the loads for which they were designed. By implication, therefore, ships' propellers are not operating as efficiently as they should be either. Changing the propeller to raise efficiency is therefore an obvious move and one which a number of shipowners have already adopted.

Propeller efficiency typically varies between 50% and 70%, with losses attributable to water turbulence, friction and rotation. Various steps can be taken to reduce these losses – from propeller polishing at the low end of capital investment, to the installation of ducts and fins at the high end. But a middle path might mean raising efficiency by reducing engine revolutions and choosing a larger diameter propeller turning more slowly.

Propeller specialists at Stone Marine Propulsion say they often encounter ships where fuel is being wasted because main engines and propellers are not coordinated as effectively as they should be. Making sure that the propeller is working as efficiently as possible is nothing new. Back in the 1970s, Stone Marine retrofitted more than 50 of its 'Economy' type propellers for re-optimised engine revolutions.

The company is now promoting its 'New Profile Technology' (NPT) propellers, formerly known as NBS and developed by scientists at Sumitomo and Newcastle University. Over 120 have now been supplied, in addition to about 100 NBS propellers in Japan. The largest unit to date had a diameter of 10.4mtr.

Their configuration is such that they offer a 2-4% increase in efficiency compared with a conventional propeller, with significant weight savings and a smaller optimum diameter. This is important for ships where there is insufficient space to optimise the propeller and engine speed by installing one with a larger diameter. In case studies, Stone Marine has demonstrated that fuel savings of up to 10-12% can be achieved by de-rating the main engine and optimising the propeller.

Propellers key to improving efficiency