engines in the 500kW to 20MW range. Spares and aftermarket services for the substantial, installed base complement the manufacturing activity at the Lincoln factory.

No.8

The current Napier 7 series, tailored to engine outputs from 2MW to 6.5MW per single turbocharger, is based around the original Napier cartridge design. The Napier 7 family constitutes the company's core range of products for the latest generation of medium-speed diesel, heavy fuel and gas engines. The follow-on 8-series is the subject of field tests, and features a single aluminium compressor wheel, single turbine wheel of nickel alloy, and air-cooled main casings in cast iron.

Napier's orders and sales volume had risen over the three years leading up to its acquisition by Primary Capital, which has declared its intent to further develop the product portfolio and increase the specialist company's turnover. Subsequent to the takeover, Napier announced that it had signed a contract with software firm Majenta PLM for the supply, implementation and ongoing support of a product design and lifecycle management (PLM) solution based on Siemens PLM Software's NX and Teamcenter suites.

Napier's future large axial turbocharger product design and engineering requirements will therefore be undertaken using multiple licences of 3D solid modelling software, including advanced sheet metal design capabilities. NX advanced finite element modelling (FEM) software will provide pre- and post-processing of 3D CAD models for engineering analysis. Besides the new design tools, NX computer-aided manufacturing (CAM) software will be employed in production for turning and for mill-turn and multi-axis milling.

Napier's management team, (L-R) Gary Rodgers, Andy Thacker and Jason Moore, roll out the Napier 8 for trials

The practice of slow steaming, prevalent in current market conditions in many fields of containership operation, has led Wärtsilä to develop new, fuel-saving solutions in both newbuilds and existing vessels to give owners and operators greater flexibility as to engine running. Targeted at two-stroke installations, the aim is to optimise fuel-burning efficiency at low loads, while retaining the possibility to return to full service speed when required. The system conceived for existing engines also addresses the risks of fouling and excessive component temperatures associated with protracted slow-speed operation.

Upgrade

Wärtsilä's Low-Load Tuning concept, applicable to new RT-flex electronically-controlled, common-rail engines, provides the lowest possible brake specific fuel consumption (BSFC) in the 40-70% engine load range. The reduced, part-load BSFC is achieved by optimising the turbocharger match for part-load operation. At less than 75% load, combustion pressure is raised through an increased scavenge air pressure and a higher air flow, and by blowing-off part of the exhaust gas flow at engine loads above 85%. Low-Load Tuning thereby necessitates the fitting of an exhaust waste gate on the exhaust gas receiver before the turbocharger turbine.

The company's retrofit solution, the Upgrade Kit, has been prepared for all RTA-series low-speed engines as well as the RT-flex generation, and entails cutting out a turbocharger when the engine is to be operated at low load. This measure increases scavenge air delivery at low load for improved combustion and more optimum temperatures of engine components. The Upgrade Kit involves fitting remote-controlled shut-off valves in the exhaust duct before the turbocharger turbine, and in the scavenge air duct after the compressor, together with a bypass line to keep the turbocharger rotor spinning at a pre-set, constant speed.

Hercules

Marine diesel engine turbocharging will be among the disciplines that will be the subject of further, detailed study as an elemental part of the Hercules-B integrated research project. Spanning three years and forming the second phase of the Hercules programme, the principal aim of the endeavour is to reduce unit fuel consumption by 10% and raise the efficiency of marine diesel propulsion systems to a level of more than 60%, with corresponding reductions in CO_2 and other emissions.

Under Hercules-A, the potential benefits and new concepts for variable-geometry turbocharging systems were studied and developed, and systems with power take-in/take-out and multi-stage turbochargers were investigated. Prototype verification tests were carried out with power take-in/take-out systems on two-stroke engines, and two-stage turbocharging was verified on four-stroke engines. □