CAN A POD-PROPELLED CONTAINERSHIP OPTIMISE ENERGY-EFFICIENCY IN A SLOW STEAMING ENVIRONMENT?

Pods for the boxship

Knud E Hansen and ABB have unveiled a 2116TEU containership to showcase the potential of Azipod propulsion for this sector

To meet the potentially expansive container feeder market, which some brokers believe will result from the introduction of ever-larger containerships, Denmark's Knud E Hansen and joint venture partner ABB have unveiled a 2116TEU vessel to showcase the potential of an Azipod unit fitted behind the main propeller.

Currently, there are no podded containerships in the fleet but the adoption of the podded propulsion technology is widely viewed as a way of optimising containership efficiency.

Dubbed the Bangkok-Max, the design is said to deliver excellent fuel economy, reduced environmental impact, reduced need for water ballast, slow-steaming potential and flexible transit speeds, loading flexibility as well as increased container capacity including higher than usual reefer capacity (1184TEU).

Both ABB and Knud E Hansen are adamant that efficiency can be 'significantly boosted' by an electrically driven contra rotating Azipod unit installed behind the directly driven main propeller. The power balance between the main propeller and the Azipod is approximately 65/35%, and as the Azipod can be turned 360deg, tug boat assistance in port could be avoided.

Compared to a vessel with a conventional diesel-direct propulsion system the main engine has been considerably down-sized, and with a correspondingly smaller propeller diameter in combination with a low shaft line, ballast water to submerge the propellers in light loaded conditions is generally not necessary.

The Knud E Hansen naval architect behind the project, Jesper Kanstrup, told *Shipping World & Shipbuilder*: 'Many containerships have been designed with a two stroke driving a cp propeller to operate at about 14kts. This works fine but if you are sailing at 17 or 18kts then you are operating an engine at 40% MCR and if you are sailing at say 10kts then the engine is operating at 20% MCR, or something like that, and this can have negative impacts on the engine. So what we have done is design a vessel with a main engine that will give a speed of 18kts whereby the main engine with its shaft generator will deliver the entire propulsion power including the electrical power for the Azipod unit, the hotel load and the reefer containers. We have downsized the engine considerably but if we need to sail faster we can take power from the auxiliary engines.'

Three auxiliary engines with a total electrical power output of approximately 8000kW are arranged in an auxiliary engine room, which is completely segregated from the main engine room. With the main engine stopped, the vessel is able to navigate with a speed of more than 13kts on auxiliary power and the Azipod alone, which provides a very high degree of redundancy and more than sufficient 'return to port' capability.

The Bangkok-Max also features ABB's Onboard DC grid system to ensure the engines run at their optimal load at any cruising speed from two to a maximum ship speed of 21kts, enhancing fuel economy and providing the option of highly flexible transit speeds, including slow steaming, which is not the case for the majority of feeder vessels of today.

Space has also been prepared in the engine casing for scrubbers or a SCR system so that the vessel can be adapted for navigating in Emission Control Areas. The vessel is even prepared for zero-emission port calls, because containers holding batteries can be stored on the aft deck and connected to the DC grid.

Should operators opt to run a dual-fuel engine on liquefied natural gas, then space has been allocated for LNG fuel tanks in one block slightly forward of midships. 'We have the space for the tanks which differs from other containerships where the fitting of gas fuel tanks would be more or less impossible,' said Kanstrup.

Danish shipbroker Maersk Brokers, the exclusive broker for the design, believes that compared to the many traditional designs on the market today, the development of this containership design has been characterised by real 'thinking-outside-the-box' innovation, which has produced some impressive results on both speed/consumption, stowage flexibility, and not least transit speed flexibility.

CFD optimisation of the hull lines is still being carried out in order to verify the propulsion efficiency data, which initial findings suggest could result in a 5 to 10% fuel saving, compared to typical feeder vessels of similar size.

'We believe that this is what is needed in a future-proof design, and should be attractive to liner operators and tramp owners, who are focused on stowage/speed flexibility and fuel efficiency – and thus a greener profile,' said a Maersk Brokers' Casper Rubaek Nielsen. 'We have generated a lot of interest and when the market is ready we hope to be able to transfer interest into firm orders.'