Figure 1: Twin skeg solution

Proven concepts re-emerge in a new era of ultra large container ships

With the ever-increasing size of container vessels, can propulsion concepts of 10 years ago still be applicable?

Sometimes, as the industry knows, history repeats itself. In the case of the new concept development for large container vessels, we have recently seen studies into the application of podded propulsors, in combination with a conventional single screw main propeller. However, back in 2002 this kind of propulsion concept configuration was already considered due to the increasing power demands on large container vessels. With the further increase in size of container vessels and considering the speed reduction of modern designs, the question arises whether the concepts of a decade ago can still be applicable. With new container ship concepts of well over 420 m in length, the issue of how to get sufficient power to the propulsion train arises.

For a shipyard, the easiest solution for these ultra large container vessels is to have a single screw vessel. But for the power to be installed to have the potential of attaining a reasonable service speed of around 22-23 knots there is the possibility that difficulties in the propeller design may start to develop, taking into account limitations in the propeller diameter for instance. Furthermore, from a redundancy point of view, a twin-screw vessel can be of interest. One of the solutions is to apply a so-called twin skeg configuration (see Figure 1).

Another solution is the contra-rotating propeller. In such cases the contra-rotating propeller can be mounted on an azimuthing pod, resulting in a hybrid propulsion system, (see Figure 2). Studies dating from 2002 showed that a 60MW hybrid configuration provided a 5% power gain, compared to that of a conventional single screw configuration. In the initial study the main propeller delivered about 60% of the total required power, while 40% came from the azimuthing pod. This study considered a high power level on a relatively small vessel, whereas nowadays these power levels are still required but for far larger vessels.

We are left asking, can these concepts be reused today? MARIN believes they can but while also taking advantage of modern CFD codes for improved hull line optimisation and new experimental techniques such as quasi-steady propulsion test methodology, all of which MARIN can provide.

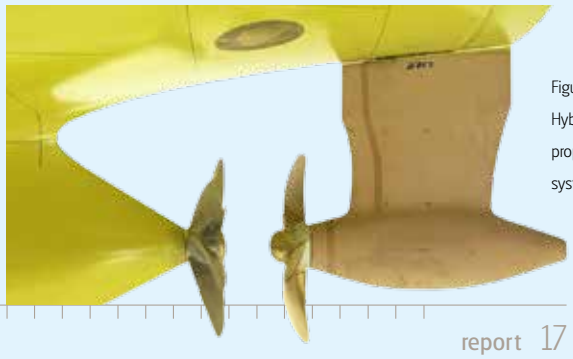

Figure 2: Hybrid propulsion system

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