What is Azipod XL and linear flow propulsor technology?

Azipod XO is the state of the art for podded propulsion, enhancing the already excellent efficiency of earlier models. Linear flow technology takes Azipod technology one step further, building on ABB Marine’s 30 years of Azipod propulsion experience and knowledge.

The basic principle of linear flow propulsor (LFP) technology is simple; the water flow behind the pulling nozzled propeller is straightened by guiding plates, reducing turbulence and energy loss. The new Azipod XL utilises LFP technology, but is still based on proven Azipod XO solutions.

Background of innovation

LFP technology is a result of systematic innovation work, creating, investigating and evaluating a huge number of different ideas and concepts.

This process led to several potentially feasible concepts, and one of the most promising was LFP. Other very promising technologies were also uncovered, and these are being investigated as well, raising expectations for new propulsion-related innovations to be revealed in the coming years.

Development of Azipod XL

Once a new technology is developed and verified, there is still long way to go before commercialisation. Technology must be implemented in products that provide customers real value, and still fit perfectly into a product portfolio.

The initial idea was that Azipod XL should provide same benefits to the customer as the current Azipod XO, but with even better efficiency. This presented several technical challenges for the engineers; for example, preserving the possibility to maintain the shaft seals underwater, without dry-docking, requires careful engineering and testing in a model environment. Ultimately, in the case of shaft sealing, the selected solution was an improvement on the XO solution. In Azipod XL, the shaft seal can be replaced even faster and quicker underwater, thanks to additional static seal arrangement for maintenance.

After the concept had been verified by CFD calculations, model tests were necessary in order to verify its potential. Model testing allowed the performance comparison of Azipod XL to the existing Azipod XO propulsor. Improvements were a clear step forward, even though the existing Azipod XO had the best efficiency on the market, proving that LFP technology can make the best even better.

Benefits for shipowners

The direct benefit for ship owners and operators is an improvement in
efficiency from 5 to 10 per cent, depending on the operational profile. LFP technology also expands vessel speed range while still operating at high efficiency levels. This means that bollard pull capability is also increased, while maintainability is also improved due to faster shaft seal replacement.

**Next steps**

Implementing of LFP technology has started on one Azipod frame size of up to 17.5 MW. After compilation of the first experiences, the same technology can be applied to other power classes. Due to improved efficiency and bollard pull capability, this solution may open for totally new application areas and vessel segments in future.

In principle LFP technology can be applied in any of the members in the Azipod product family. When the need is for higher hydrodynamic efficiency at a wider operational speed range, LFP technology can provide the solution. Even vessel types where the benefits of electrical propulsion are only now being realised may in the future be equipped, not only with electrical propulsion, but also with LFP technology.

It will be interesting to see which doors are opened by the new, energy saving LFP technology.

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Development path from the initial Azipod idea to Azipod XL2100