CTV access to wind turbines: improving efficiency and reducing costs

Mainprize Offshore has operated in the North Sea for over thirty years, and the family behind the company has a fishing heritage that dates back generations. This team has extensive experience in the offshore oil and gas industries, and has been going from strength to strength since entering the offshore renewables sector in 2012.

Mainprize Offshore's radical multi-purpose CTV designs have been met with strong demand. They've taken delivery of eight vessels since 2012, with a further three being built and plans to expand the fleet even further.

As well as achieving an impressive fifteen industry firsts, Mainprize Offshore's vessels are also notable for features including fuel and water pump speeds, transit speeds in adverse weather and their deck space of 200m. All this makes the fleet really versatile, saving clients the costs of bringing in other vessels when they need to undertake scopes of work that are beyond the capabilities of a standard crew transfer vessel.

Fifteen industry firsts

Mainprize Offshore Ltd has been accredited to ISO9001 2015, ISO14001 2015, ISO45,000 2018, Achilles, Sellicha, and holds records for fifteen industry firsts:

- 2014 (1) MO1 and (2) MO2 highest speed 25Kts with high payload 25T
- 2016 (3) MO2 largest deck at 160m, (4) fuel capacity 50,000L, (5) fuel pump speed 500L/Min, (6) water capacity 20,000L
- 2017 MO3 (7) largest deck 180m, (8) fuel 55,000L and (9) water capacity 30,000L and (10) pumping speed 350L/Min, (11) largest deadweight 65T
- MO4 (12) 1.3m operational draft and 1.5mHs transfer height, 23 meters with a payload of 40T
- MO5 26m semi swath, (13) transfer height 2.0mHs highest in class for the given deadweight. (14) 70T deadweight, (15) 50,000L of water

Reducing the costs of CTV access to turbines

There are many ways to reduce the costs of operating an offshore wind park, including bringing down capital and operational costs by reducing the size of the CTV. These savings pale into insignificance, though, when you consider the offshore, on-turbine daily cost of a technician, the fuel, CTV costs, back to back, managers, weather and more. Add in the potential downtime of an asset, the loss of power generation and associated revenue, and the costs add up even further.

That's why Mainprize Offshore focuses on wave height transfer, using research and development to increase this and refining their capabilities further by assessing the vessel. It's more than a question of transfer height, though. They also put a great deal of importance on comfort and on delivering the technicians to site feeling refreshed and ready to work (think of them as a kind of a first-class delivery service!).

The team's assessments include roll, pitch, heave (and the effects each of these have), the temperature of the saloon, light levels, leaching of chemicals from the fit out materials and the installation of negative pressure toilets. By understanding all this, the vessels can operate successfully in higher wave heights, meaning clients can plan servicing with a higher level of confidence, reducing turbine downtime, using technician time efficiently and hugely reducing the scopes of work.

All that, in turn, reduces the number of days needed and therefore means large reductions in fuel burn, fewer in-port days, and higher power generation. The cost savings are significant and the additional power generation can be substantial.

CO2 emissions and environmental impact

Mainprize Offshore has a keen eye on CO2 emissions and green credentials. When designing their CTVs they assess each and every component, with a focus on lightweight products. They also operate the vessels in the lightest condition possible, keeping the hulls clean, impressed systems and operating the vessels in the optimum range for the most efficient parameters. Looking to the future, they're also investing in hydrogen dual fuel and hybrid technologies.

Flexible, cost-effective solutions for site-specific operations

A great example of Mainprize Offshore's work is the delivery of their MO4 vessel to Deutsche Windtechnik for operations on the Nordergründe Wind Farm.

The contract scope was to put forward a cost-effective solution that met the site requirements: a minimum of 20 meters LOA, 20T of fuel, 20T of water, 20T of cargo, 1.4m draft 1.5mHs and 20Kts cruise speed. The results have been unbelievable. The MO4 outperformed comparable and larger CTVs operating on the same site, and what was even more apparent was that Mainprize Offshore could save up to 2,000L of fuel per day by using a site-specific design over an off-the-shelf unit.

They achieve this by investing in a multitude of systems. The engine, gearbox, drive train, propeller design, rudder, fender, and hull are all assessed and each and every component and its placement on the vessel is carefully considered.

From each component's weight to its CAPEX–OPEX cost and reliability, all aspects are taken into account in the plans and specifications. When building a site-specific vessel, the team assess over 30 site-specific points so that they can fine-tune the design even further.

Another good example of the team's work is the evolution of the hull, fender and propeller design from the MO1 vessel to the MO3. The MO3's propeller is designed for higher bollard push, reducing speed efficiencies by 4.5%, but these improvements increase push efficiencies by more than 25%, meaning higher safety margins when pushing on, lower overall fuel for the same operations and overall cost efficiencies including higher transfer height.

That means that for a site that is close to the base port and has a smaller site area, speed efficiency will be less weighted than bollard push efficiencies. With that in mind, the team can tailor each component to the site-specific values. This gives them a valuable head-start in future-proofing their fleet and designs for the advent of zero-emissions CTVs and other vessels.

Team culture drives innovation and the highest standards

The level of innovation seen in these designs is all thanks to the team's drive and passion to move forward and embrace new working methods, designs, smart thinking and solutions. They're willing and able to think outside the box, and their clients can see the cost savings the innovations will offer.

With the team forming such a core strength of the business, it's no surprise that Mainprize Offshore puts a high value on workplace culture and take great pride in the

level of knowledge and know-how among their employees. In line with client expectations, they demand the highest standards and ownership from the team, and balance that out by making the company a great place to work.

Mainprize Offshore strives to maintain a workplace that attracts people of the highest calibre, providing a culture with a healthy work-life balance where the team feels (and really is!) valued. They foster a 'family' culture and if any of the vessels are in dock for service and other vessels are in the same port, then it's all hands on deck. Personal wellbeing, lifestyle, respect and support to achieve personal goals all feature strongly, and that's all backed up on a practical level by a semi-flexible working pattern, career progression and a commitment to having key dates off.

Strong partner relationships are crucial

As well as the strength of their own team, service partners play an integral part in enabling the truly 24/7/365 service that Mainprize Offshore provide. That's down to the relationships they've built over the years with trusted, respected, and hard-working providers such as Esbjerg Shipyard, Grumsen Esbjerg, Zeppelin Esbjerg, RG Seasite DK and Allset Esbjerg. These service providers play a vital role in maintaining the vessels to high standards and are ready to react at any moment to ensure that when the inevitable happens, downtime is kept to a minimum.

Planning for the future

Mainprize Offshore plans to continue reinvesting in research and development into hull design, lightweight materials, enhanced efficiency items and future technologies, keeping the company at the forefront of crew transfer and multi-role transfer vessel designs. As well as maintaining technical excellence, they also want to grow their business organically and sustainably.

They plan to maintain their focus on overall site profit, with higher performing vessels and crews not coming cheap, but being offset by an increase of 25% uptime, which reduces the number of technicians needed, allows for better planning, reduces downtime, costs and fuel and hugely increases power generation. This is an approach that they've clearly demonstrated over the years, and its success is reflected in the increased profits they see recorded by their clients.

Mainprize Offshore has a five-year look-ahead with various plans ready to implement should the need arise. Those plans include designs above 40 meters, ultra-fast designs of over 45kts and designs for zero-emissions. There are no immediate plans to build these on speculation, however, with the company preferring to wait instead until the market is ready for the designs at a commercial scale. The future is looking interesting indeed.

www.mainprizeoffshore.co.uk