Self-climbing kit on the option list for floating wind farms

Developers take close look at potential answer to costly tow-to-shore repair operations, writes **Heidi Vella**

The floating offshore wind industry is studying a variety of in-situ heavylift options to deal with major component failures and avoid spiralling operations and maintenance bills for towing faulty hardware back to port.

The sector's limited options for on-site O&M works have been brought into sharp focus after developer ACS this year made a £12.9m provision to cover the cost of disconnecting, towing and repairing a Vestas 9.5MW turbine affected by a major component failure at its flagship 50MW Kincardine floating project off east Scotland.

A second turbine has also gone offline at the wind farm and now industry insiders are mulling whether bringing hardware back to shore is the most economic strategy for a sector hoping to unlock gigawatt-scale projects in the near term while cutting costs to compete with fixed-bottom sites.

Floaters are usually located in waters too deep for conventional jack-ups equipped with large cranes that are used to service fixed-bottom turbines. This limitation and the dynamic environment of floating wind has made tow-to-shore the default option when major turbine faults occur.

However, a proliferation of self-hoisting and self-climbing crane concepts that do not require jack-ups or giant cranes but instead attach and work off turbine towers are garnering attention as a possible future solution.

Casper Kann *(right)* of O&M consultancy PEAK Wind is the operation preparation project manager for Copenhagen Infrastructure Partners' proposed 100MW Pentland floating wind farm off north Scotland.

Several developers of self-climbing cranes are being screened for involvement on the project, he told reNEWS.

Pentland will initially follow a tow-to-shore O&M strategy for major component replacements but hopes to shift to offshore repair when possible with self-climbing cranes being a potential solution.

Concepts currently under development include the SENSE Rotor Nacelle Assembly (RNA) transfer carriage by SENSEWind, which the company reckons is ideal for floating projects.

A transport carriage attached to the base of the turbine is equipped with power supply and automatic controls to move the nacelle up or down the tower.

Independent modelling based on real data from a potential 500MW ScotWind project found the solution can reduce the levelised cost of energy by 9%.

The technology mitigates the need to build ever larger cranes to install and service bigger and bigger turbines, said SENSEWind chief executive Patrick Geraets.

The loads are less than tower and foundation operating design limits so no additional reinforcement is needed. However, the turbine needs to be designed with the rail system incorporated and fitted harbourside.

SENSEWind is also designing a tethered-leg floating foundation on which it can integrate the system although in principle it can be used with any floating base.

The company plans to further test the SENSE system onshore next year using £10m of UK energy department BEIS funding and to undertake offshore testing of key elements at 15MW scale.

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YOUR CARRIAGE AWAITS: The SenseWIND nacelle installation and removal technology in action on an onshore turbine

Photo: SENSEWind

Photo: Boskalis

Early intervention the key to keeping O&M costs in check

The most effective floating wind O&M solutions will only be nailed down once the sector's major component repair rate becomes clear.

ORE Catapult's Ralph Torr said such fixes should happen infrequently, which could make floating wind-specific solutions less commercially viable.

"If major component exchange occurs to just one or two turbines within a project every five to 10 years then self-climbing cranes look less important but if it's more frequent then towing back to shore is not viable," he added.

Industry sources pointed to the woes at Kincardine *(above)* and warned that the impacts turbine movement during towing for installation and when in operation have on internal components is not yet fully understood. Machines at floating wind farms may have a higher failure rate compared to fixed-bottom projects.

ORE Catapult's research shows the industry should be more focused on adopting preventative and predictive measures, such as condition monitoring, a maintenance approach that predicts machine health and safety through sensor data.

"If we can see that something is going to fail it's possible to pre-plan maintenance activities, which will save money," Torr said.

Recent studies indicate up to 8% of direct O&M costs can be saved through early intervention. ■