



Cost-savings arise as crew transporters double-up as survey ships

An innovative approach to carrying out seabed surveys pioneered on wpd's Nordergründe offshore windfarm is being rolled out on the Butendiek, Dan Tysk and Sandbank offshore windfarms

Regular inspection of the seabed is essential to detect anomalies and help prevent damage to cables and scour protection around offshore structures. It is even more important on a windfarm such as Nordergründe, in the Weser estuary, where seabed conditions can change quickly.

Regular surveys of the seabed are mandated by the authorities – in Germany the agency is the Federal Maritime and Hydrographic Agency or Bundesamt für Seeschifffahrt und Hydrographie (BSH) – but conducting surveys using specialised survey vessels is not cheap, particularly if a survey vessel needs to be called in at short notice, such as following a storm.

How much more cost-effective might it be, thought Deutsche Windtechnik – which specialises in maintaining and repairing wind turbines on land and at sea – if vessels that were already on the windfarm could conduct the surveys?

The answer, it seems, is very cost-effective, because the concept the German firm adopted – using crew transfer vessels (CTVs) fitted with a multibeam sonar – is going to be used on other German offshore windfarms, and could have export potential too.

As Deutsche Windtechnik managing director, the Netherlands, Geert Timmers, and Deutsche Windtechnik Offshore und

Consulting managing director Carl-Rasmus Richardsen explained, the concept they pioneered arose from a simple idea: why not modify a couple of CTVs so that they can be fitted with a sonar and have them use idle time on a windfarm to provide regular, detailed surveys?

By upgrading the CTVs, underwater surveys can be combined with other offshore tasks the vessels are already undertaking. “Combining tasks allows us to be more flexible,” said Mr Richardsen. “In addition to cost savings, our customers benefit from expertise from a single source and lean, integrated processes.”

“The conditions on Nordergründe are known to be quite challenging,” Mr Timmers told *OWJ*. “Being where it is, close to the mouth of the Weser, leads to the creation of sand waves. This means the water depth can sometimes change by several metres in a way that is rare on other windfarms. Equally, scour can occur and cables can become exposed.”

Deutsche Windtechnik and shipowner Mainprize Offshore Ltd modified two CTVs – *MO2* and *MO4* – so that they could deploy a sonar through a moonpool. The sonar is a multibeam unit from Kongsberg Maritime. It can be used to detect sand waves, scour and debris on

ABOVE: Deutsche Windtechnik has modified two crew transfer vessels to act as survey units

the seabed if, for instance, a jack-up vessel needs to know that it can safely deploy its legs. Since the sonar was acquired, *MO2* and *MO4* have used it to keep an eye on potential scour around the foundations for the wind turbines and substation on Nordergründe, to see if conditions have changed from year to year.

The cable routes in the offshore windfarm have also been carefully surveyed with particular attention to cable entry points and cable cover on the seabed. Bathymetric data can now be compared on a regular basis and the depth of the trench in which cables are laid assessed. When determining the depth of the trench it is important to ensure the cable only exits the seabed at the entry points into a turbine or the substation. An unprotected cable poses a significant risk. Once the vessels are in the area to be surveyed the sonar is deployed through the moonpool. With assistance from Kongsberg Germany, Deutsche Windtechnik has trained personnel to operate it. It does not need to be in position underwater while the vessel is in transit. The survey head is lifted back into the vessel once a survey has been completed, so there is no question that operation of the CTV might be affected or its fuel consumption increase. A motion reference unit from Kongsberg Seatex compensates for the movement of the vessels when undertaking surveys.

Apart from meeting statutory requirements, Mr Timmers observed, it is also in the interests of the owner of a windfarm to ensure that everything under the water is in order. The output from the surveys is tailored to meet the specific



requirements of the customer.

“Some clients might simply want assurance that everything on the seabed is as they would wish it to be,” Mr Timmers explained. “For clients who want to see more, we can produce a range of services from raw data and interactive data to charts showing them what’s going on on the seabed.” After preliminary processing, data can be accessed via Deutsche Windtechnik’s online portal. “If something is detected, we can also suggest appropriate repair solutions,” Mr Timmers told *OWJ*.

Interestingly, Deutsche Windtechnik believes the survey solution it developed for German waters – and the ‘cluster approach’ it has adopted to sharing the survey assets across a number of offshore windfarms since it was first used on Nordergründe – could be highly applicable in other markets, such as Taiwan, one of the fastest growing offshore wind export markets. “A number of the windfarms that are going to be built offshore Taiwan will have many of the same issues as those we’ve already addressed on Nordergründe,” said Mr Timmers.

ABOVE: Enabling CTVs to act as survey ships gives them a dual role and reduces costs

Fugro returns to Hornsea zone

In June 2018, Fugro commenced marine site characterisation work at the Hornsea Two offshore windfarm in the UK.

The contract, awarded by Ørsted, covers geotechnical site investigation and follows other contracts awarded earlier this year for geophysical investigation services at the site.

Geotechnical data acquired by Fugro will support developing the ground model, assist design activities for the turbine foundations and inform cable route design at the Hornsea Project Two and Hornsea Project Three sites.

Fugro’s work scope includes seabed and downhole geotechnical investigations that will be undertaken using state-of-the-art equipment from Fugro’s specialist vessels.

“We’re delivering this offshore project using our new Seacalf Mk IV system for seabed cone penetration testing,” explained project manager Dennis van den Bulk. “Unlike conventional rod systems, it combines safer and more weather-tolerant operations with higher quality data by eliminating manual rod handling and its constant penetration speed. This approach means we can provide an efficient solution to meet project milestones while improving safety performance.”

Bibby HydroMap invests in autonomous technology

UK-based Bibby HydroMap has partnered with iXblue to bring ‘DriX,’ an autonomous unmanned surface vessel (AUSV), to the European market.

Designed with an innovative hull shape optimised for coastal and offshore missions, and manufactured using composites, DriX can operate for seven days, providing data acquisition at speeds of up to 14 knots. Multiple navigation options are also available ranging from full autonomy, to autopilot, remote supervisor action, a ‘follow-me’ function and a ‘hovering’ mode, all of which comply with collision regulations.

Initially mobilised with a dual-head Teledyne Reson SeaBat T50 integrated multibeam echosounder, DriX has been available to Bibby HydroMap’s existing and new customers from June 2018 and will offer increased production and productivity during survey data acquisition.

DriX will be used to supplement existing survey capability across projects undertaken by Bibby HydroMap, and performance information will form part of the continued development of the asset. *owj*