



Multibeam Echosounder

## INTEGRATED SEABED SURVEYS REDUCE COSTS

DEUTSCHE WINDTECHNIK USES MULTIBEAM ECHOSOUNDERS  
FOR INTEGRATED TASKS

Regular inspections of the seabed enable early detection of anomalies and help to prevent expensive damage to cables and scour protection, thereby reducing the associated risks to the stability of the wind turbine or substation. These inspections can be rather costly, especially if they are commissioned separately. After successfully introducing cluster management of wind farm inspections, Deutsche Windtechnik has now expanded its technical expertise in the field of underwater inspections. This has resulted in the development of further cost saving potential by combining seabed surveys with other offshore activities.

### VESSEL VERSATILITY PAYS OFF

Since the beginning of 2018, Deutsche Windtechnik has been using the multibeam echosounder from the Norwegian manufacturer Kongsberg. The MO2 and MO4 transport vessels have been upgraded with this technology, and this provides attractive

opportunities for offshore wind farm operators. It allows underwater surveys, which are part of recurring inspections under the subsea maintenance plan, to be combined with other offshore tasks that the CTV is already performing. "Combining various tasks

“More flexible than almost any other”

allows us to be more flexible than almost any other provider. In addition to cost savings, our customers also benefit from lean, integrated processes and expertise from a single source." Hans Spengler, Team Leader Subsea Surveys, said regarding the advantages for wind farm operators.

### NORDERGRÜNDE AS A PIONEERING PROJECT

Deutsche Windtechnik employed and tested this technology in 2017 at the Nordergründe

**NOT JUST FOR TRANSPORT PURPOSES:** The MO4 can now also perform seabed surveys using multibeam echosounder technology.

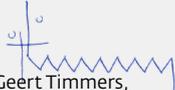
## EDITORIAL

### Dear friends of wind energy,

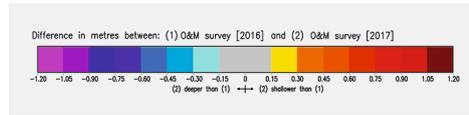
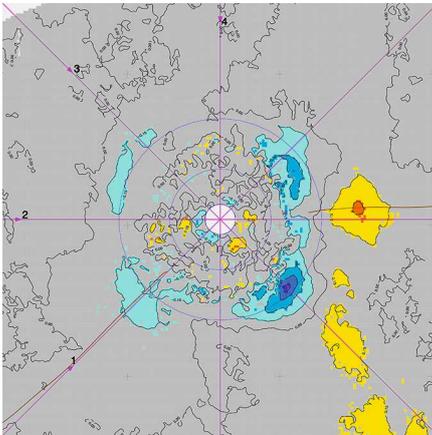
We are always looking for new ways to enhance quality and reduce costs for inspections and maintenance in offshore wind. Take for example the highly specialised seabed surveys, which are required to assess scour protection status and protective cable coverage.



Deutsche Windtechnik recently acquired the necessary technology and expertise and created new processes to allow us to integrate seabed surveys in our daily offshore operations. We are now able to integrate staff transfers and refuelling tasks by Crew Transfer Vessels (CTV) with underwater surveys. We can provide you with individually tailored assessments of the vital elements of your Balance of Plant at reduced mobilisation costs. Read more about it in this infoletter!

  
Geert Timmers,  
Managing Director Deutsche Windtechnik B.V.

## DIFFERENCE MODEL



**CHANGES IN THE SEABED AND SCOUR PROTECTION** around an offshore wind turbine are shown in graphical representations like this. The yellow and orange areas show an increase of the seabed cable coverage or scour protection. Cyan and blue indicate a decrease. Deutsche Windtechnik advises the operator whether countermeasures are necessary.

## INTERVIEW

Hans Spengler, Team Leader Subsea Surveys at Deutsche Windtechnik, is an expert for seabed surveys and the corresponding technology.



### How important are underwater surveys for wind farm operators?

Scour protection is a crucial component for the stability of wind turbines and substations, and if weaknesses occur here, then it causes long-term risks that are difficult to calculate.

When determining the cable trench depth, it is important to ensure that the cable only exits the seabed at the entry points into the wind turbine or the substation. An unprotected cable poses a significant risk because without it the wind turbine or even the entire offshore wind farm could be cut off.

### How often should underwater inspections be carried out?

At least once a year, as required by the recurring inspection concept as well as the subsea maintenance plan. If necessary, also after special occurrences such as unusually strong storms. In these cases, waves can cause significant changes to the scour protection.

### How does the wind farm operator receive the results?

Very large amounts of data are generated during a survey. The data goes through preliminary processing and is then prepared according to individual customer requirements. Depending on the requirements, we provide the documentation via Deutsche Windtechnik's online portal or present the results in a personal meeting. In addition, we provide consultation and can identify possible necessary repair measures.

## CONTACT

**Deutsche Windtechnik B.V. (Netherlands)**  
Geert Timmers, Managing Director

E-mail: [g.timmers@deutsche-windtechnik.com](mailto:g.timmers@deutsche-windtechnik.com)  
Phone: +31 613 78 16 69

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**PUBLISHER** Deutsche Windtechnik AG, Corporate Communications, Stephanitorsbollwerk 1 (Haus LEE), 28217 Bremen, Germany  
**CONTACT** E-mail: [info@deutsche-windtechnik.com](mailto:info@deutsche-windtechnik.com), Phone: +49 (0) 421-69 105-0, Fax: +49 (0) 421-69 105-499, [deutsche-windtechnik.com](http://deutsche-windtechnik.com)  
**EDITORIAL TEAM** Katrin Kasche (Deutsche Windtechnik AG)  
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## THE ADVANTAGES AT A GLANCE: Integrated seabed surveys

- ▶ Significant cost reduction by combining underwater surveys with other activities
- ▶ Versatile and flexible use of the CTV for employee transports, heavy load transports, platform refuelling or underwater surveys
- ▶ Deutsche Windtechnik's integrative approach is uncomplicated, solution-oriented and flexible
- ▶ Reduction of the amount of work related to project management

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wind farm using the wind farm's own CTV. "The technology in itself and the combination of seabed surveys with other vessel activities have proven to be very effective, even in this large area with its constantly changing sandbanks," Hans Spengler said. This year, the concept will also be used for the first time at the Butendiek, Dan Tysk and Sandbank offshore wind farms as part of cluster management within a limited period of time.

### KEEPING AN EYE ON TWO IMPORTANT AREAS

Two important underwater areas are examined using the multibeam echosounder technology. "The data enables us to see how the scour protection around the wind turbines and the substation has changed compared to the previous year. The cable routes are inspected with special attention

to the cable entry points and the cable cover on the seabed. The bathymetric data from the previous year and the current year are compared to determine the current trench depth," Hans Spengler explained. The multibeam echosounder uses the principle of running measurement with sound signals to gather data. The device sends out an ultrasonic signal that is reflected by the seabed and then picked up again by the multibeam echosounder. The water depth can be determined using the propagation time of the sound waves, and this allows conclusions to be drawn about the scour protection and cable depth. A Motion Reference Unit (MRU) continually compensates for the movements of the ship, for example due to waves. The position in all three directions on the globe is determined using the RTK (Real Time Kinematic) signal.