



## Depth of Burial Survey for Inter-Array Cables

Borkum Riffgrund 3 Offshore Windfarm

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Kraken Robotics' Sub-Bottom Imager (SBI) delivered precise imaging of buried interarray cables, leveraging advanced acoustic technology to ensure compliance with burial requirements critical for the safe and efficient operation of offshore wind turbines.

Boskalis, on behalf of Ørsted, engaged Kraken Robotics to conduct a depth of burial survey for inter-array cables at the Borkum Riffgrund 3 Offshore Windfarm, located in Germany's North Sea Exclusive Economic Zone (EEZ). These cables connect the wind turbines and must be buried at sufficient depths to avoid damage from external threats such as fishing equipment, anchors, or environmental conditions. Ensuring proper burial depth is essential to maintaining the wind farm's reliability by reducing the risk of costly repairs, exposure, and potential disruptions to energy production.



### Kraken's Sub-Bottom Imager (SBI)

To perform the survey, Kraken deployed its Sub-Bottom Imager (SBI) mounted on a Work-Class Remotely Operated Vehicle (WROV). This advanced system provided high-resolution 3D acoustic imaging, which allowed for precise detection and mapping of buried cables. The shallow soil conditions and material properties of the cables created a clear acoustic contrast, enabling Kraken to rapidly identify and confirm burial depths with exceptional accuracy. Unlike traditional sub-bottom profilers, which often require multiple survey passes at different angles, the SBI delivered comprehensive results in a single pass, showing both the depth of the cable as well as a 3D view of lithological features near the cable.



## Securing Infrastructure Integrity

Kraken's SBI data provided Boskalis with critical insights into the integrity of their windfarm cables. Key benefits include:



#### Efficient & Accurate Surveys

Kraken's innovative approach ensured the accurate confirmation of burial depths across more than 70 km of inter-array cables.



#### Cost & Schedule Savings

By eliminating the need for redundant survey passes and avoiding having to shut down the cable's power to survey, the SBI significantly reduced costs and completion time.



#### Operational Assurance

The data provided guaranteed compliance with design requirements, helping to mitigate future risks to cable integrity and ensuring the long-term reliability of the wind farm's infrastructure.

Through its advanced technology and efficient survey process, Kraken Robotics supported the operational integrity and energy-generation goals of the Borkum Riffgrund 3 wind farm.



Figure 1 - Plan view of a buried inter-array cable

# confirmed burial depths of inter-array cables



Figure 2 - Profile view of buried inter-array cable surfacing to turbine

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