

# Oceaneering Completes Successful Wind Turbine Anode Installation

## ROV-based renewable energy project support



### Project Overview

Oceaneering was contracted by a leading geotechnical and offshore solutions provider to install anti-corrosion plate anode clamps on offshore wind turbine bases subsea. The job was performed by a work class Oceaneering<sup>®</sup> Magnum<sup>®</sup> Plus ROV fitted with a vendor-supplied torque tool, which mounted the

clamps to the wind turbine bases, using a torque of 750 Nm.

The anode installation was completed in May 2017 at an offshore wind farm located in an estuary. Water depths on the job varied from 52 ft to 98 ft (16 m to 30 m).

## Challenges

One of the major obstacles in this project was the currents in the estuary area. The currents significantly affected the available safe working window for the ROVs and had the potential to adversely influence the project schedule. At some points, the team was limited to 2-hour working windows.

Additionally, visibility in the estuary was often compromised. The location of the project meant that muddy waters often reduced visibility to 1.6 ft (0.5 m), if not less. This lack of sight, coupled with strong currents, presented a working environment in which completing tasks safely and successfully was a challenge.

The anode installations were completed in water depths from 52.5 ft to 98.4 ft (16 m to 30 m), and some of the anodes were in difficult positions based on ROV accessibility.

## The Oceaneering Solution

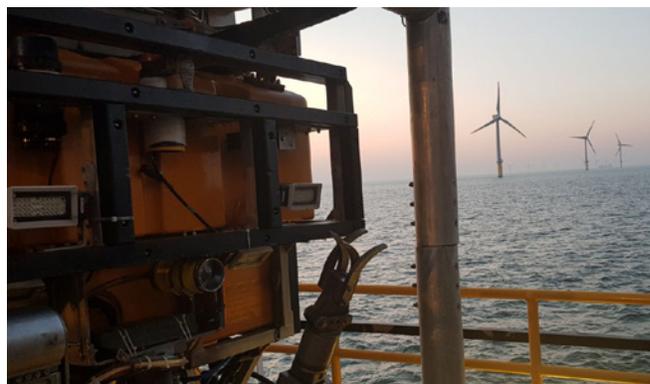
Oceaneering used tide tables, current meters, and onsite expertise to maximize dive time by operating within tidal windows to capitalize on as much time-on-location availability as possible.

When visibility dropped to almost 0 ft (0 m), the Oceaneering team mobilized a 3D imaging sonar and an image enhancer to keep the project moving forward.

Larger jaws were sourced and fitted to the five-function manipulator so the ROV could grab onto the large-diameter structure while fitting clamps and thus hold station during high currents, again to maximize working windows.

During operations, the Oceaneering team made modifications to the torque tool to

ensure its safe, efficient disengagement from the anode clamps. Additionally, a real-time imaging sonar fitted to the ROV provided valuable information during periods of low visibility. This enabled accurate navigation from the tether management system to the wind turbine pile.



## Results

The project was completed on schedule, despite extremely challenging conditions. The relative newness of the project scope and equipment spread were hurdles that the team was able to overcome by adapting quickly and dynamically, and with specialist knowledge and experience.

Without the project team's flexibility and ingenuity, the customer may have needed to delay operations, incurring more costs. The Oceaneering ability to troubleshoot and identify solutions resulted in a successful outcome and satisfied customer.

The highly capable Magnum Plus ROV enabled us to safely install the anode clamps in heavy weather and high currents. Additionally, Oceaneering provided auxiliary support to the customer by aiding another ROV operator—who was using a small eyeball ROV nearby—to locate trapped messenger wires and free them, helping to complete their task.

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