

Oceaneering SCAR System Prepares Seabed for Offshore Wind Farm

Seabed system provides boulder clearance and pre-cut trenching of array cable routes



Project Overview

Located off the coast of Germany in the Baltic Sea, the completed offshore wind farm now generates enough clean energy to power nearly 350,000 homes, generating 350 MW from 70 giant wind turbines.

During the construction phase of this offshore wind farm, the Oceaneering Renewables And Special Projects (RASP) team operated its SCAR Seabed System over a 16-week campaign, clearing boulders from 21 mi (34 km) of array cable routes, followed by 51.6 mi (83 km) of pre-cut trenching in both single-pass and multi-pass mode.

Issues

Recently acquired survey data had identified significant areas of boulders covering 45 of the proposed array cable routes, which would be detrimental to the future cable lay and jet trenching operations. A corridor needed to be cleared in these boulder areas to allow future operations to go ahead.

The original requirement for this work was for pre-cut trenching only of the array routes between Wind Turbine exclusion zone locations, completing each route by trenching around the second exclusion zone boundary, at a suitable offset, to allow the array cable to be laid into the trench for short-term storage before the cable pull-in could be performed. However, during operations, the client realized that the point where the SCAR vehicle broke off from the design route to achieve this offset curve was a greater distance away from the Wind Turbine Location than had been allowed for in their calculations regards the required number of cable protection covers. The RASP team was asked to review the client's operations in the field in order to minimize this distance and reduce the overall quantity of protection covers required.

The Oceaneering Solution

The RASP team had initially been contracted to provide pre-cut trenching services throughout the more competent soils within the wind farm array that were unsuitable for jet trenching. Following the discovery of the boulder fields, the

flexibility of the SCAR system (which can be operated in different modes) was able to maintain the client's mobilization schedule—thus providing one system to perform both tasks, and minimizing additional financial impact.

Following discussion with the client's cable installation engineers, it was apparent that the pre-cut trench was not required to be curved around the exclusion zone at the second end. To this, a proposal was made to allow a test trench to be created with the SCAR system from the cable route intersection at the second exclusion zone, towing the SCAR system out and into a previously cut trench from the first exclusion zone area.

Following a management of change (MOC) exercise, the trial was successfully performed, and multibeam echosounder (MBE) data was acquired to confirm that the minimum required trench depth was retained for the entire trench. After numerous successful operations within the wind farm array, the procedure was then adopted to "rectify" the initial curved trench ends. The same procedure was adopted, with the added complication of the SCAR system having to trench through the existing berm wall created across the cable route as the SCAR system was towed off around the exclusion zone. This procedure was completed successfully, with support provided by the remotely operated vehicle (ROV).