

Revolution Wind Farm Inter Array Cable Trenching Operations and Lessons Learned

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This study analyses trenching performance and key lessons learned during the installation of a U.S. offshore wind energy project located in federal waters off the northeast coast of the US, highlighting critical factors affecting burial efficiency in complex seabed conditions. The development comprises over 50 wind turbines and includes a complex infrastructure network of inter array cables and offshore substations. The study identifies operational factors that affected overall performance during inter-array cable installation and provides practical guidance for optimizing future cable installation strategies in regions with complex geological and glacial environments.

The analysis focuses on trenching performance, with particular attention to the geologically related operational challenges encountered in near-seafloor conditions of glacial and post glacial soils. Results highlight the critical importance of pre-installation planning, specifically the acquisition of high-resolution geophysical & adequate geotechnical data to accurately characterize shallow soil conditions. Variability in seabed composition—including glacial till, coarse sediments, the presence of boulders and lateral facies changes within units—introduced significant operational constraints that required adaptive trenching strategies.

Key lessons emphasize the necessity of selecting trenching equipment that is matched to site-specific geological conditions and optimizing trenching parameters to maximize burial speeds while ensuring the structural integrity of the cable remains intact. The study underscores the operational impact of second pass and third pass burial requirements when the initial depth of lowering is not achieved, second-end cable free-spans, last minute micro-routing, extended remedial times and their impact on survey validity, and repeated post-trench surveys driven by unidentified shallow soil problems caused by subsurface lateral variability.

Overall, the findings reinforce the value of precise and bespoke pre-project preparation including early-phase geophysical consultation and analysis to ensure fit-for-purpose data acquisition, improved geotechnical characterization and equipment selection to reduce risk, control costs, and improve trenching performance in complex seabed environments of

future offshore wind developments.