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Sheringham Shoal Offshore Wind Farm

Metocean Design for Sheringham Shoal Offshore Wind Farm

Metoc plc, environmental design and risk management specialists, has completed a Metocean Design for Scira Offshore Energy for the proposed 'Round 2' Sheringham Shoal offshore wind farm in the southern North Sea off the North Norfolk coast, just inside the 12 mile territorial limit. The study assesses metocean criteria for engineering design, fatigue analysis, and installation planning of wind turbine structures, other associated offshore structures, and seabed cabling.

The wind farm is to consist of some 45 to 108 wind turbines, within a site of 14 sq. miles, (35 sq. km). The turbines rated power will be between approximately 3.0 and 7.0 MW, with an estimated maximum power capacity of 315 MW. The minimum distance to shore from the nearest turbine will be around 9.0 nautical miles and the turbines are to be supported by foundations secured to the sea bed.

For the metocean analysis, Metoc produced information on prevailing and extreme conditions for wind, waves, current, and water level, including their joint probability of occurrence, to assist engineers with integrated loading analysis and project planning. Secondary variables, such as temperature, ice and snow, and marine growth, were also addressed.

The study made use of a broad range of measured and modelled data sources, in combination with in-house Metoc analysis tools and international offshore industry best practice. Particular attention was paid to the calibration and validation of long-term hindcast model data in relation to site-specific measurements.

The work also quantified the spatial variability in metocean conditions across the wind farm - specifically current, water level, and wave crest elevation. The project will be combining this information with its geotechnical assessment across the site. The wind analysis included desk-top assessment of the wind resource, the wind speed profile with height, and wind energy density spectra and turbulence intensity at

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nacelle height.

With fatigue analysis a key design consideration, the study produced detailed information on wave climate in terms of height, period and direction, and its energy density spectra, in a form that allows ready input into integrated engineering analysis packages such as GH Bladed. One of the key deliverables from the study is a long-term database of wind and wave time series which was produced to enable the project to perform further operability (installation and maintenance access) simulations.

Note to Editor:-

Metoc provides EDRM, Environmental Design and Risk Management, expertise for resource development where the demands of engineering meet the constraints of marine, coastal and river environments. Metoc's EDRM support extends through the project life-cycle - from strategic planning, design to construction and decommissioning – for water sector, cable, oil and gas, renewables, desalination, power stations, marine aggregates and waterfront resource development.

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