Weather sensitive operations in the North Sea

Challenge

Subsea 7 S.A. is a seabed-to-surface engineering, construction and services contractor providing planning, design and delivery of complex projects in harsh and challenging environments. During a project destined for the Jura oil production field in the North Sea, Subsea 7 needed to transport and build large constructions of up to 7 km in length. First, they had to move a large tow head by sea from Nigg, Cromarty Firth, to Sinclair’s Bay where it was attached to long pipe bundles then towed out to the Jura field. The length of bundle made it highly sensitive to wave height and period.

For an operation involving such large constructions, weather and marine conditions play critical roles. Subsea 7 needed information on weather windows for various stages of the process including a vital 48 hour window for transportation to the Jura field. This operation required winds of force 5 or less; significant wave height not exceeding 0.5 m and that the tide on approach and departure was on high water and roll-off was on low water. Subsea 7 also sought forecasts for the construction of a temporary roadway on the beach to transfer the tow head.

Solution

Hindcast analysis was carried out to help identify the most likely times when there would be a weather window for the operation. Once the opportunity was identified, a project team was put in place. Together with the five-day detailed forecast, we provided probability forecasts illustrating the outlook for wind and wave conditions out to 14 days ahead.

Tow and move forecasts were used to ensure the safe transit of the barge and towhead. As the weather window approached, precise information and advice was critical so a forecaster was deployed to be on hand to brief the operational teams. This enabled Subsea 7 to take all opportunities and for contingency plans to be made.

Benefits

With a dedicated Met Office forecaster on-site, Subsea 7 had up-to-the minute marine weather expertise and advice. Our involvement in planning meetings enabled us to understand Subsea 7’s critical limits, and ensure timely response and relevant use of planning data. Using our detailed forecasting advice, Subsea 7 was able to make plans and contingencies and avoid the high costs of maintaining crews on site, waiting for weather, but ensured sufficient notice to make sure crews arrived on time.

“Our on-site Met Office forecaster Martin’s forecasts were close, if not spot on, to what we actually experienced, and his input to the project was crucial for the successful operation.”

Arnbjørn Joensen,
Construction Manager,
Subsea 7