Saving Time and Money during Offshore Wind Farm Construction
Lessons Learned from Innovation

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Abstract

Houlder is an independent provider of all forms of offshore engineering, marine equipment, project management, design and analysis to the offshore wind sector. Installation equipment includes foundation upending and lifting tools, pile gripper arms and subsea positioning templates.

Offshore wind farm construction is only going to become more complex. Larger and heavier foundations are proposed for deeper water locations and more challenging wind and wave regimes.

Key to success has been analysis of how large 6-8m diameter piles behave in the water.

Houlder’s products should be of interest to anyone tasked with the design or procurement of related equipment in the future.

Monopile Gripper Arms

Fig 3: Houlder Monopile Gripper Arms as installed on the MIP Discovery during Rampion Windfarm installation.

Houlder’s pile handling arms aid the installation of piles in up to 40m of water.

- Handle piles of up to 650T weight
- Handle piles of up to 65m length
- Handle piles of up to 7m diameter

A second pair was installed on Swire Blue Ocean’s Pacific Orca. As well as designing the arms, Houlder designed the vessel attachment and grillage support structure.

Subsea Pile Templates

Houlder Subsea Templates fix the relative positions and verticality of piles on the seabed to ensure that jacket legs fit into the pre-installed piles. They also provide a corrective moment to the pile to resolve any misalignment and can accommodate up to 5° of soil level changes.

Monopile Lifting & Upending

Fig 4: Houlder Lifting & Upending Tool as deployed during Rampion Windfarm installation.

Houlder’s Lifting & Upending Tools have been designed for safer and faster installations. The remote controlled hook-up and release system engages directly with a foundation pile’s flange. This eliminates the need for additional lifting points or straps – making the tools the optimal solutions where the lifting point overhangs the deck of the installation vessel or is out of reach.

Jacket Foundation Lifting Tools

Fig 6: One of Houlder’s Jacket Lifting Tool Designs

Houlder’s External and Flanged Jacket Lifting tools have capacities up to 2,000t. They eliminate the need for human intervention increasing the safety and speed of operation and have been designed to maximise operational flexibility. They do not require amendments to the jacket design while ensuring structures are not overstressed by temporary installation loads.

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