ACTEON

A WORLD-FIRST FOR FLOATING DRILL OPERATIONS USING MOTION COMPENSATION IN DEEP WATER

LDD coupled their reverse circulation drill rig with a motion compensation platform to devise a solution that delivered a complete anchor pile installation service in a challenging seabed environment.

Project name: Limetree Bay installation
Location: Caribbean Sea, circa. 2km off the coast of St. Croix, USVI
Client: Imodco Terminals, a subsidiary of SBM Offshore
Work scope:

- Design and engineering applicable to the pile installation
- Pile handling, mobilisation, and offshore execution
- Grouting elements
- Survey work

THE PROBLEM

Imodco Terminals were contracted to install a catenary anchor leg mooring (CALM) buoy to facilitate the reliable transfer of products from very large crude carriers to an onshore facility. For the CALM buoy to hold position, seven anchor piles needed to be drilled and grouted into the seabed.

During the engineering phase, options, including driven piles and drill and grouted piles, were considered. Typically, reverse circulation drilling takes place off a jack-up barge (JUB) or from the pile top itself. However, challenging environmental conditions made conventional methods not suitable: water depths varied between 80 and 300m with a sloped seabed experienced up to 20 degrees. In addition, the physical attributes of the anchor pile design and the geology presented their difficulties, with low levels of overburden and some areas straight onto bedrock.

THE SOLUTION

LDD decided to integrate their reverse circulation LD2500 drill rig with Barge Master's motion compensation platform (BM-T700). LDD's rig was cantilevered from the motion-compensated platform which was sea fastened on the SBM Installer, a DP3 capable diving support and construction vessel (DSCV) chartered by LDD. The platform allowed the drill system to maintain a constant and stabilised position in relation to the seabed.

The combination of the drill system and motion-compensated platform operated in wave conditions up to 2.5 Hs. The project proved that drilling could be achieved from a floating asset using motion compensation.

LDD worked on-site with sister company CORE Grouting Services, who deployed their grouting plant from the back deck of the DSCV. Fully grouted piles with a design strength of 40MPa were completed, each in 24 hours.

In total nine Acteon Group, operating companies worked together to deliver the installation phase of the project, led by LDD allowing for a single point of contact for the client. Through the engineering stage of the project, LDD worked with Geoscience specialists UTEC and 2H Offshore to assess the conditions that were to be found on site. The results of the analysis carried out allowed for an expeditious and completely bespoke project tooling period at LDD's specialist facility.

THE RESULT

LDD completed the installation of the seven anchor mooring piles for the CALM Buoy, drilling from a DSCV in water depths over 270m. The floating set-up employed, whilst unique and bespoke, has the potential for industry-wide application.

Nine Acteon companies have come together on this project, to provide all necessary work to install the piles, from surveying to engineering, drilling, and grouting. All companies have a long experience working together on the same sites and are familiar with each other's equipment and working patterns. This integrated approach was instrumental in the success of this project from the contract stage onwards, where a single point of contact with LDD was made for all project services from Acteon, simplifying tendering, commercial negotiations and contractual dealings and preventing gaps in continuity between service providers.