

Germany Tripod Installation at Global Tech I Monitored by KCI

Posted on Jun 11th, 2013 with tags .



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KCI has been entrusted with the installation assistance of tripods series 3, 4, 5 and 6 for Global Tech I Offshore Wind Farm in the German part of the North Sea.

The installation of the first tripods, weighing approximately 900 tons each, started in September 2012. The tripod installation is still ongoing. As the soil conditions of all 80 tripods to be installed are different, every installation is unique. KCI was assigned with the review of the on-bottom stability analyses, the preparation of installation procedures and the offshore monitoring of the tripod installation.

The sea bed of the 41 square kilometers wind farm Global Tech I varies from sand to clay. Furthermore, the water depth for the installation of the tripods varies from 38 to 40 metres. Therefore every tripod installation is truly unique and the pile penetration for each tripod is different.

Together with another company, KCI worked on analyses for bearing, sliding and toppling failure mechanisms to ensure the stability of the tripod during the various stages of the installation process. As a result of these analyses Global Tech I decided to enlarge the original mudmats which are being welded to the tripods and act as a temporary foundation.

KCI's on-bottom stability analyses included a calculation during which sea states (wave heights) the tripod installation is still safely possible. They advised the client in the weather interpretation, "start of installation decision" and sequence of pile installation depending on the actual tilt and wave conditions.

During the actual operation, while working in different shifts, KCI engineers Ronald van Dijk and Arash Ramezani supported the client's team in monitoring the tripod leveling operation from the Heavy Lift Jack-up Vessel 'Innovation' which transported 3 tripods per voyage. The allowable tilt of the tripod was achieved with the so-called intelligent driving method. The first 10 metres the piles were vibrated with a vibrohammer. After all three piles per tripod were vibrated, the remaining metres were driven with an impact hammer. By adjusting the sequence of vibrating/ driving the tilt of the tripod could be controlled. A controlled way of pile driving is proven to be absolutely necessary to achieve the installation tolerances. With this method additional mitigations for tilt control was not required anymore.