

Project:

Gode Wind I & II Windfarm

Location:

North Sea, Germany

Project completed:

2015

Developer/s:

Dong Energy A/S

Applicator/Contractor:

FoundOcean Ltd.

Main Contractor:

GeoSea

Market sector:

Offshore wind energy

Products used & amounts:

MasterFlow 9500

5,918 tons

Gode Wind I & II Windfarm

MasterFlow 9500 for two offshore windfarms



Our reference in the German North Sea: Gode Wind I & II Windfarm

The background

DONG Energy decided to build the offshore windfarms Gode Wind 1 and 2 in the German sector of the North Sea. Gode Wind 1 (330 MW) and 2 (252 MW) consist of 97 Siemens turbines, each of 6.0 MW, with a total capacity of 582 MW. It is DONG ENERGY's biggest investment to date. The windfarms will be able to supply CO₂-free power corresponding to the annual electricity consumption of approximately 600,000 German households. In early 2015 MasterFlow 9500 grout was selected for the grouting works at the Gode Wind 1 and 2 offshore windfarms after evaluation and testing as part of the German requirements to meet single case approval (ZiE) procedures.

The challenge

For this windfarm, which is located in the German sector of the North Sea, MasterFlow 9500 was chosen for grouting XL monopile foundations due to its exceptional mechanical and installation properties. MasterFlow 9500, the first ever material to receive type approval certification from DNV GL according DNV-OS-C502 for use at temperatures as low as 0°C, allowed the grouting to be carried out in shorter but more frequent weather windows. The foundation installation contract was carried out by Belgium-based contractors GeoSea. The 97 XL monopiles required specialist grouting works with ultra-high strength grout to fill the annular gaps between the XL monopile and transition pieces.

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Our solution

After installation of the XL monopile foundations into the seabed, transition pieces are positioned over the XL monopiles and lined out for verticality of the turbines to be installed.

Fixed grout lines fabricated on the transition pieces allowed for connection of flexible hoses at the access platform. These flexible hoses then extended to the turbine deck to allow the grouting contractor to connect grout hoses via a flexible boom arm from the vessel.

Over 61 tons of MasterFlow 9500 Exagrout was pumped into the XL monopile transition piece connections using the grouting contractor's equipment which is proven to double current grout output rates when compared with other high strength grout mixers on the market.

The project to install the 97 foundations, including the grouting works, was finished approximately 1.5 months ahead of the planned schedule.

The customer's benefit

The high mixing and delivery system utilizing the grouting contractors full-pack high output mixing systems delivered a new record for the fastest foundation installation using MasterFlow 9500 in big bags. Over 48 hours of actual grouting time were saved on the grouting works, saving many more hours of valuable vessel time.

Because of the early strength development of MasterFlow 9500, the permitted weather window, which is necessary for the installation operation, was reduced to give project efficiency, which thereby significantly improved cost savings and performance.

Projects facts at a glance

- Number of turbines: 97 x Siemens SWT-6.0-154
- Windfarm total capacity: 582 MW
- Homes equivalent: 600,000
- CO₂ reduced per year 833,065 tons
- Blade diameter of approximately 154 m
- Area of the windfarm: 70 km²
- Construction period: 2015
- Foundation type: Grounded Monopile foundation
- Typical water depth: 28 – 34 m
- MasterFlow 9500: 5,918 tons

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