Helix Performance Profile

T1200 Sheringham Shoal Offshore Cable Trenching

Quick Stats

Project duration: 62 days

Distance trenched: 49.97 km

First dive time: 30 hrs

Total downtime: 14.44 hrs

Downtime percentage of project: 1.74%

OBJECTIVE

In August 2012, Helix Energy Solutions Group Inc.'s robotics subsidiary, Canyon Offshore Limited (U.K.), was contracted to conduct trenching operations with the T1200 water-jet trenching system in the Sheringam Shoal offshore wind farm off the coast of the United Kingdom. The scope of work comprised of trenching of the inter-array cables with an approximate total length of 100km.

Project Location Map

The Sheringham Shoal offshore wind farm is owned equally by Statoil ASA and Statkraft AS through joint-venture company Scira Offshore Energy Limited. Statoil is operator for the project during the development phase and Scira is the wind farm operator. The project utilises Statoil's longstanding offshore activities and Statkraft's expertise in renewable energy.

The 35km² Sheringham Shoal offshore wind farm is located 17km to 23km offshore from the coastal town of Sheringham, North Norfolk. Water depth at the wind farm site varies between 15m and 22m, with a maximum tidal range of about 4m.

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CANYON OFFSHORE

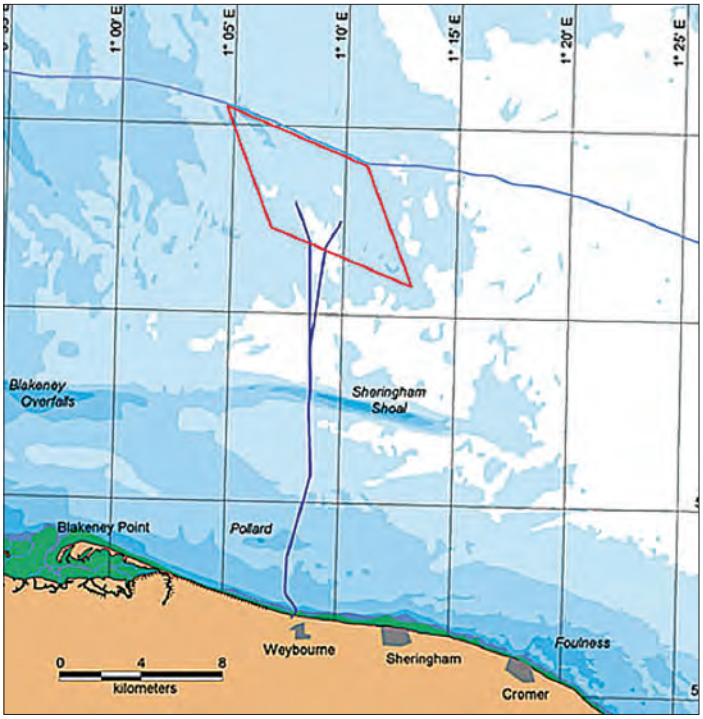
SEABED AND SHALLOW SOIL CHARACTERISTICS

General

The Sheringham Shoal wind farm is located 20km off the Norfolk coastline in approximately 20m of water. The general stratigraphy in the region comprises Quaternary sediments overlying Cretaceous Chalk. The Quaternary forms the Swarte Bank Formation beneath the Egmond Ground and Bolders Bank Formation. Eroded channels within the Bolders Bank have been filled in with the Botney Cut Formation which is made up of sand, silt and clays. A thin layer of Holocene sand intermittently blankets the Bolders Bank and Botney Cut, a Formation across the array area.

Bathymetry

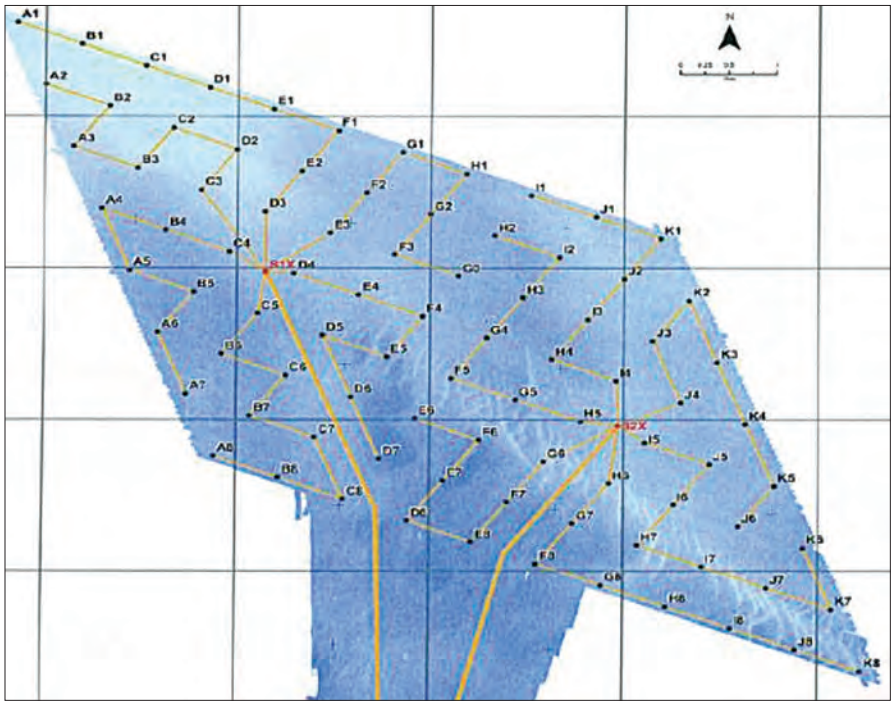
Bathymetrical data revealed the seabed within the array site to be generally flat with water depths ranging between 16.5m and 22m. A thin ribbon of low sand ripples extend across the project site starting from just west of the center and continuing in an easterly direction. The sandwaves are orientated in a NNE to SSW direction and are indicated to be approximately 1.0m to 1.5m high. A number of submerged items were discovered, including fishing gear strewn across the area. No existing cables or pipelines are shown passing through the array site.



An overall view of the Sheringham Shoals Wind Farm.

FIELD INFORMATION

The wind farm has 88 wind turbine generators, each with a unit rating of 3.6MW. The turbines are connected via the inter array cables and fed back to two offshore substations. The 33kV array cable circuits interconnecting the wind turbine generators and the substations are rated up to 36MVA where the voltage is stepped up to 132kV before being transmitted ashore.



A view of the Sheringham Shoals Wind Farm cable layout.

The total installed power capacity of the wind farm is 315MW, which is electrically divided in two halves due to restrictions in the onshore grid connection capacity.

PRODUCT SPECIFICATIONS

Product 1	Specification	Trench Length (m)
Infield Cable Type 1 400mm²	TSRA 36KV 3x1x400mm² KQ+FO	4750
Cable weight dry, approx.		27kg/m
Submerged weight		17.1kg/m
Minimum bending radius		1.9m
Minimum Bending Radius Of Core (Above Core Sheath)		0.75m
Maximum permissible pulling tension		120kN
Target Scaling Factor		266µV
Outside Diameter		122mm

Product 2	Specification	Trench Length (m)
Infield Cable Type 2 185mm²	TSRA 36KV 3x1x185mm² KQ+FO	30500
Cable weight dry, approx.		18 kg/m
Submerged weight		10.5 kg/m
Minimum bending radius		1.6m
Minimum Bending Radius Of Core (Above Core Sheath)		0.65m
Maximum permissible pulling tension		80kN
Target Scaling Factor		235µV
Outside Diameter		106mm

GEOTECHNICAL SUMMARY

The required depth of lowering the product was dependent on the strength of the seabed soils with the following specification being defined:

Depth of Lowering	Soil Strength
1.0m (+/- 100mm)	<80kPa
0.5m (+/- 100mm)	<80kPa

Conclusion

Canyon Offshore Limited (U.K.) completed the Sheringham Shoals project in a 62 day period that spanned from early July to September. The overall distance trenched was 49.97km, with an average of .805km trenched per day. On its first dive, T1200 spent more than 30 consecutive hours on the bottom in trenching mode and only spent a total of 14.44 hours on downtime, equating to just 1.74% of the whole project. The burial achieved during the project varied depending on the product. For the Infield Cable Type 1 400mm² a minimum depth of cover of 0.8m was achieved. For the Infield Cable Type 2 185mm² a minimum depth of cover of 0.5m was achieved. Readings of the burial where taken every two hours during the trenching of the project and an average can be worked out from said data.

OPERATIONS TIME BREAKDOWN

Category	Total Number of Hours
Working	733:11:00
Maintenance	4:21:00
Down Time	14:44:00
Standby	829:52:00
Mob / Demob	284:50:00
Waiting on Weather	0:00:00
Waiting on Current	94:07:00