

PROJECT SHEET

TRITON KNOLL OFFSHORE WIND FARM
 SUPPLY AND INSTALLATION OF 2 EXPORT CABLES (220 KV)
 AND 97 ARRAY CABLES (66 KV)

BOSKALIS

Royal Boskalis Westminster is a leading global marine contractor and services provider. With safety as our core value, we offer a wide variety of specialist activities to the oil & gas and renewables sectors. These activities include marine installation and decommissioning, seabed intervention, marine transport and services, subsea services and marine survey. In addition, Boskalis is a global dredging contractor, provides towage and terminal services across the globe and delivers marine salvage solutions.

By understanding what drives our clients we are able to provide the solutions that enable them to meet their specific business goals. For this reason we are constantly looking for new ways to broaden and optimize our offering and are committed to expanding our proposition, supported by our financial strength. With our committed professionals in engineering, project management and operations, 900 specialized vessels and an unprecedented breadth of activities in 90 countries across six continents we help our clients in the offshore industry push boundaries and create new horizons.

INTRODUCTION

The site for the Triton Knoll Offshore Wind Farm is located 32 km off the coast of Lincolnshire in the UK and 50 km off the coast of North Norfolk. This wind farm will be served by 2 Offshore Substations (OSP) and 90 Wind Turbine Generators (WTG) interconnected by 97 inter-array cables (IAC). The total installed capacity will be up to 860 MW.

The work for this project was divided into two separate projects. The first project involved the installation of the export cables via two export routes (east and west) from the land to the Offshore Substation Platforms (OSP). The second project involved laying all array cables to establish the connection between the 90 WTG's and the 2 Offshore Substation Platforms.

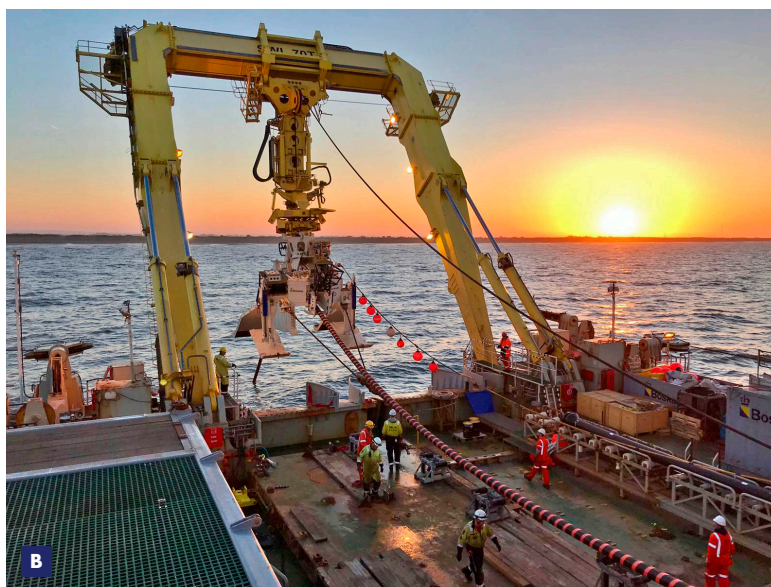
The site conditions characterized by dense cobble areas, numerous boulders along the cable routes, mobile sand waves and mega ripples, strong tidal current and relatively shallow water made this project extra challenging.

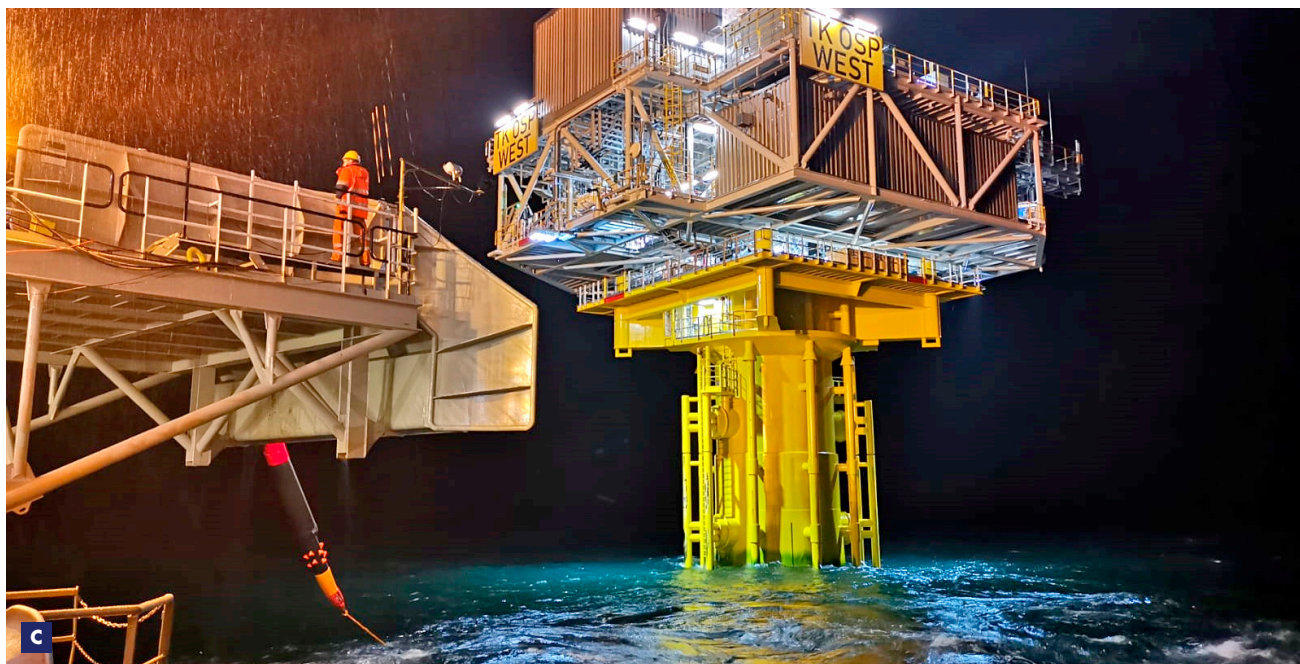
FEATURES

Client	Innogy UK (RWE Renewables)
Location	Lincolnshire, United Kingdom
Period	2019 – 2020
Contractor	VBNK (the consortium between Boskalis and NKT)
Kind of project	Export and Array cable supply and installation
Cable supplier	NKT



A Cable Lay Vessel Ndurance
B Cable Lay Vessel Ndurance and the HD3 plough





SCOPE

The blue colored items on below list are the works picked up in synergy with the array scope.

EXPORT

- Supply of 220 kV submarine power cables (2 x 50 km)
- Supply of cable accessories
- 2 HDD's at shore landing
- Pre-lay survey
- Sand wave levelling
- PLGR
- Simultaneous lay and burial of 2 cables
- 6 pipeline crossings, pre-lay mattress installation, post lay rock installation
- Termination and Testing (By NKT)
- Remedial protection by rock installation

ARRAY

- Supply and installation of 66 kV array cable (145 km in total)
- Supply of cable accessories
- Pre-lay survey
- Sand wave levelling
- PLGR
- 6 pipeline crossings, pre-lay mattress installation, post lay rock installation
- Termination and Testing (Subcontracted party)
- Remedial protection by rock installation

SYNERGY

The focus on this project was to create synergy in the Export and Array scope to reduce overall costs. Another great accomplishment is the optimal use of the Boskalis fleet and several business units, such as Subsea Services, Hydraulics and Seabed Intervention.

FACTS & FIGURES

EXPORT SCOPE

- | | |
|--------------------|------------|
| ▪ Cable lay vessel | Ndurance |
| ▪ Fall pipe vessel | Rockpiper |
| ▪ Backhoe dredger | Manu Pekka |
| ▪ Plough | HD3 plough |

ARRAY SCOPE

- | | |
|--------------------------------|---------------|
| ▪ Boulder clearance vessel | Boka Falcon |
| ▪ Boulder clearance plough | BCT XXL |
| ▪ Mattress installation vessel | Boka Atlantis |
| ▪ Boulder relocation vessel | Boka Atlantis |
| ▪ Cable lay vessel | Spirit |
| ▪ Cable trenching vessel | Ndeavor |
| ▪ Hybrid trencher | CBT2400 |
| ▪ Jetting trencher | TROV 107 |
| ▪ Fall pipe vessel | Rockpiper |