



CASE STUDY

220 kV AC Connections Cluster West of Adlergrund

Marine Survey for Cable Route Design and Engineering.



SCOPE OF WORK

Marine survey in the western Baltic Sea off Germany

Next Geosolutions has been appointed to perform a marine survey for cable route design and engineering for the Project “220 kV A.C. Connections - West of Adlergrund” in the western Baltic Sea off Germany.

The Project consist of multiple 220 kV AC grid connections of the two **offshore wind parks (OWP)** “Arkona Basin South-East” and “Wikinger” located in the western Baltic Sea off the north-eastern coast of Germany.

Along the cables corridor, approx. 90 km in length, are planned:

- 2 cables for the OWP “Arkona Basin South-East”
- 2 cables for the OWP “Wikinger”
- 1 cable to connect the two OWP

**Baltic
Sea**

AREA

**0-40 m
wd**

WATER DEPTH

**3×90 km
1×7 km**

CABLE ROUTE LENGTH

**220kV
AC**

POWER

SERVICES

What we did to get to the end result

The branches who are working on this ongoing project are Next Marine, Next Earth and Next Remote joining forces.

Onshore/nearshore topographic survey

From the shoreline to the sea/land joint bays area.

Utility crossing survey location

Both in-service (*two pipelines and one fibre-optic cable*) and out-of-service (*three telecommunication cables*), by pipe/cable tracker mounted on ROV and video survey.

Inshore and offshore geotechnical survey

By VibroCorer and PCPT, with both **onsite/on-board classification and on-shore lab testing**.

Unexploded Ordnance (UXO) survey

To complement any sections of the Final Selected Routes (FSR).

In-field and final report

Including charts.

Inshore and offshore marine survey

The inshore and offshore survey include:

- Cable routes corridor **bathymetric and geophysical survey**, by MBES, SBES, SSS, SBP and magnetometer operated from surface. In particular, a high resolution MBES/SSS survey is requested to detect the presence of boulders on the seabed surface
- In-field selected routes (*IFSR*) survey, by MBES, SBES, SSS, SBP and magnetometer operated from surface
- High resolution **sub-seabed geophysical survey** for buried boulders detection
- **Data processing** for all field survey tasks to be carried out on-site/on-board.

Data processing for all field survey tasks

To be carried out on-site/on-board.

METHODOLOGIES

How we achieved the end result

The unique way we combine methodologies and innovation to reach the best possible result in the most effective way.

Surface positioning

The surface positioning shall be carried out by means of a **DGPS satellite radio-positioning system**. A marine gyrocompass with the highest accuracy shall be used and interfaced to the Data Logger and Navigation Computer.

Bathymetry

The bathymetric survey shall be run by using hydrographic multibeam Echosounder. Bathymetric raw data collected shall be **processed in real-time on board** and delivered to the reporting team onshore, for the final revision and reporting.

Sub-bottom profiling

A suitable sub-bottom profiling system shall be used in order to help and integrate the interpretation of sonar data and give a continuous and clear definition of the **bottom nature and sub-bottom stratigraphy**.

Geotechnical survey

The geotechnical survey shall be carried for the detailed Burial Assessment Study (BAS). Geotechnics shall be performed after all the other previous survey tasks. The geotechnical campaign for the BAS shall be performed by:

- Sampling by VibroCorer (VC)
- Measurement by piezo-cone penetrometer test (PCPT)

Visual inspection on existing power cables

The visual inspection shall be carried by an ROV along the unburied cable sections. Where the cables are buried shall be use a cable tracker mounted on the ROV itself.

Underwater positioning

The underwater positioning shall be ensured by means of a **USBL system**, interfaced with the data logger and navigation computer.

Side scan sonar

To characterise the **geomorphological setting of the seabed** and to detect/verify the presence of any obstacles and/or seabed features, the High Resolution Dual Frequency Digital Side Scan Sonar shall be operated for the marine survey.

Magnetometer

To detect any magnetic anomaly and ferromagnetic target, a suitable towed marine gradiometer shall be used during the survey.

UXO survey

The aim of the UXO survey is the detection of any **explosive** ordnance on the indicated areas.

Onshore/nearshore topography

A detailed topographic survey shall be performed at landfall both onshore and nearshore, by means of RTK DGPS technology.

OUR COMMITMENT

Quality, Health, Safety, Environment

We adopt **QHSE Management Systems** which embody all aspects of Quality Assurance, Competence Monitoring and Risk Assessment, as well as comprehensively addressing Health, Safety & Environmental issues.

Next is committed to always deliver products and services of a consistently high quality, aiming to meet and possibly *exceed the Client's requirements and expectations*. The health and safety of employees and other persons involved are safeguarded, and proper regard is paid to the conservation of the environment.

NEXT QHSE Management Systems are fully in-house managed.

RESOURCES

The assets involved in the project

The resources and technologies which have concurred to the marine survey for cable route design and engineering in the Baltic Sea.marine survey for cable route design and engineering we have been appointed for.



R/V IMOR for Offshore



Imoros2 for Nearshore



Imoros2 for Nearshore

Equipment

DESCRIPTION	TYPE/MODEL
Topographic Equipment for Alongside Calibrations	DGPS-RTK Leica SR530
ROV–Light Work Class + Cable Detection system	Tomahawk + TSS 350
Primary Surface Positioning	DGPS Fugro STAR FIX 4100
Secondary Surface Positioning	DGPS Fugro STAR FIX 4100
Data Acquisition & Navigation Software	QPS QINSy software package
Heading & Attitude (Back-up)	Ixsea Octans
Underwater Acoustic Positioning System	USBL Sonardyne Ranger II
Multi-beam Echosounder	Reson SeaBat 8125 + Reson SeaBat 8160
Side Scan Sonar	Klein 3000 + Edgetech 4200
Sub-Bottom Profiling 1	Geoacoustics Chirp II
Marine Magnetometer	Marine Magnetic SeaspY
Sound Velocity Profiler	Valeport Midas SVP