Cathie provides geotechnical support to Blyth Offshore Demonstrator Wind Farm to mitigate risk and resolve design and construction issues.
EDF Renewables, one of the UK’s leading renewable energy companies which develops, builds and operates generation projects with a focus on onshore and offshore wind, has developed the Blyth offshore demonstrator wind farm off the North-East coast in the UK. EDF Renewables took over responsibility for the scheme from National Renewable Energy Centre (now ORE Catapult) in October 2014. We were appointed by EDF Renewables to support the project in the geotechnical aspects of design and development phase, based on our support to the previous owners.

The project consisted of installation of five wind turbines located around 5.7km off the coast at a water depth ranging from 36 to 39 metres. The project’s total generating capacity is 41.5MW that will power approximately 34,000 homes.

The project incorporates three new innovative features:

- The use of float and submerge gravity based foundations
- The installation of the largest serial production WTG on a GBF, in a 66kV format
- 66kV cable was used for array and export cable

**Challenge**

The first stage focussed on conducting UXO, geophysical and geotechnical survey off the coast of Blyth ahead of the offshore construction work. EDF required experienced technical engineers that could not only support the survey activities but also provide integrated ground modelling, design review, assistance with geotechnical risk management and construction support for the installation of five turbines.

**Solution**

We were the geoscience advisor for the BODL project. We completed the initial ground model, geotechnical desk studies, design and management of geophysical and geotechnical investigations and facilitated the characterisation of the ground conditions, assisted in the definition of design parameters and provided key specialist geotechnical expertise on soil performance under cyclic loading and installation issues.

We engaged throughout the investigation of the seabed for geohazard assessment and characterisation including addressing risks associated with deep mining, silty sands and variable ground conditions. We also supported the seabed preparation operations (dredging and rock placement) and scour protection works for the foundations. Cable engineering investigations, cable burial risk assessment (CBRA) to aid the specifications for the depth of burial, cable protection and support of the cable installation operations, were provided by Cathie engineers.
We further supported the project with our geotechnical expertise by reviewing foundation geotechnical designs and supporting the certification by DNV-GL. Expert engineering knowledge and judgement were required in the aspects related with cyclic loading and cyclic degradation resting of the soils.

**Impact**

EDF Renewables project team worked with a robust pre-construction ground model which facilitated a successful design and planning of the project. Our team supported key geoscience, geotechnical and installation aspects, enabling EDF Renewables to identify and mitigate geotechnical design risks at key stages during the design phase of the project with continuity of support throughout all phases of work.

Foundations and subsea cables depend on a robust ground model, risk register, engineering expertise and seabed risk management to reduce project costs. We are committed to providing end-to-end, integrated geospatial, geophysical and geotechnical support to the project to mitigate risk, reduce cost and ensure timely delivery on offshore wind projects.