

CASE HISTORY

Application: **Renewables**

Technology: **PS Logger[®], High Resolution Acoustic Televiewer (HRAT)[®], 3-Arm Caliper**

Location: **Geotechnical Investigation - Neart na Gaoithe OWF, Fife, Scotland**

The Neart na Gaoithe wind farm, developed by EDF Renewables UK, produces up to 450 MW of low carbon energy from 54 Siemens Gamesa SG 8.0-167 DD turbines each with a height of over 200m. They provide power for around 375,000 homes. It is estimated that over the project's 25-year lifespan, it will contribute 0.6% of GDP to the Scottish economy and create thousands of jobs during the construction phase as well as operations and maintenance jobs over its lifetime.

Requirement:

Robertson Geo Services (RGS) was contracted to conduct downhole wireline logging as part of a comprehensive geotechnical investigation. Four boreholes were to be logged from the Apollo jack-up rig and a further five boreholes were to be logged from the Omalius heave-compensated drill ship. Each borehole was drilled to approximately 45m and the suite of three probes was run in each.

Equipment:

The suite of Robertson Geo specialised probes were the 3-Arm Caliper, High Resolution Acoustic Televiewer (HRAT)[®] and PS Logger[®], the latter being the most popular probe for offshore wind farm geotechnical investigations. These tools were used for characterisation of lithology, locating fractures and to determine rock strength.

The surface equipment used to deploy the probes comprised a 2000m Marine Winch, Micrologger2 surface acquisition unit and a GEOsheave 3k sheave wheel.

Operations:

Initial work on the project began in September 2018 on the jack-up rig where four boreholes were completed before the equipment was re-mobilised to the Omalius drill ship. For the Omalius logging application the winch was bolted into a steel frame which was mounted on the underside of the rooster box. The depth cable and data cable were connected to the winch and were carefully lowered and fed into a container on deck, from which the engineer controlled the logging operation. RGS engineers were actively involved in the project for two months, rotating personnel between the two vessels.

Challenges and Solutions:

The windy marine environment found on the northeast of Scotland presented a challenge for the engineers as the geophysical operation was the final component of the investigation on each borehole and could at times be near the limit of the "weather window". The set up on the Omalius required the winch to be secured on the underside of the rooster box which meant it had to be craned into position, an operation requiring close cooperation between the engineer and the drill deck crew to ensure safety. Weather permitting, operations ran 24/7 which meant that the engineer had to be available to start the logging at any hour, sometimes at short notice.

End value to client:

The velocity profiles, Vs and Vp, collected by the PS Logger[®] were used in determining rock strength and the televiewer delineated fracture data was used for lithology characterisation.

