

# DEEPWATER

## DUDGEON OFFSHORE WIND FARM EXTERNAL CP MONITORING SYSTEMS INSTALLED IN NORTH SEA

### V-String reference electrodes allow CP data to be accessed remotely without need for technicians on-site.

The high water flow makes installing fixed sensors for any length of time very difficult, and the cost of repeated site visits by technicians to retrieve the data makes remote access the more suitable option. Deepwater's rugged monitoring system based upon V-string reference electrodes tethered to a semi-tensioned tether system were selected as a suitable solution to the requirements. Remotely accessed data logging systems powered by PV solar systems were paired with this to minimise ongoing operational costs. Deployment of each of the 4 systems in their entirety took approximately 12 hours.

At the time, the Dudgeon offshore wind farm (OWF) was a new development under construction and designed to support 66 wind turbine generators (WTGs). All foundations had been driven.

To provide assurance that the installed external galvanic CP systems on the structures were providing the required protection, Statoil identified a need for fixed CP monitoring systems to be installed during the early stages of the field construction, so that the early CP polarisation data could be gathered and any long-term seasonal variations identified and further monitored.

The final system design consisted of a topside unit with data logging and remote communication capabilities for the storage and transmission of data from the 3 zinc V-string reference electrodes to be installed per structure. The monitoring and communications equipment comprised of off-the-shelf (OTS) components.

The entire system was installed without any subsea intervention by diver or ROV; cameras attached to the crane hook and acoustic release systems were leveraged to remove the requirements and keep installation costs down. Rope access teams supported the topside routing and fitting of the tether tensioning system and monitoring systems.

The subsea component comprised a weight mattress connected to the WTG above the waterline via a synthetic tether with the CP potential electrodes attached at specific points along its length. The FLXMAT system was selected as the most suitable solution to provide the ballast;

Weather conditions were a limiting factor due to the minimal distances between the vessel, the crane, and the turbine structure. However, all elements of the installation and commissioning work scope were completed successfully and ahead of schedule, requiring approximately 1.2 days per system.

Fixed CP potential reference points have been installed on four representative structures at an early stage of construction - giving an indication of polarisation behaviour and ensuring/validating the CP design for the entire OWF.

CP data can now be remotely accessed without needing technicians to directly access the site, decreasing O&M costs and workload.

More info at [www.stoprust.com](http://www.stoprust.com)



#### LUCKY ASSET

Out of 66 OWF monopiles, four were chosen for CP monitoring.



#### NO DIVERS OR ROVS WERE NEEDED

Rope access teams completed the topside routing.



#### TECHNICIANS WERE NEEDED FOR INSTALLATION

But no techs are necessary to access CP readings remotely once installed.