
WAY AHEAD IN CORROSION CONTROL

OFFSHORE WIND

DEEPWATER

ABOUT US

We protect offshore infrastructure from corrosion by developing more efficient systems and monitor the productive lives of assets.

Founded In 1986, Deepwater is a full-service offshore corrosion control company, supplying the energy industry with expertise in cathodic protection and corrosion engineering.



Deepwater develops technology and improves industry understanding to deliver the simplest and most total install cost effective cathodic protection solutions to clients around the world. We have consistently found new ways to protect and monitor the life of the worlds offshore infrastructure.

We are way ahead in corrosion control.

EXPERTISE

Over 30 years, Deepwater has developed numerous methods and technologies for monitoring and controlling corrosion on virtually any type of offshore asset, particularly the internal and external surfaces of offshore wind turbines.

CP systems

Cathodic Protection (CP) systems for rapid installation on new and existing assets. Deepwater has designed and built more anode systems for offshore infrastructure than anyone else.

Polatrak® monitoring systems

Fixed electrodes and CP test stations for tracking cathodic protection performance over time with dramatically-reduced survey costs. We also manufacture portable probes for divers and ROV.

Offshore services

NACE and GWO certified offshore corrosion inspection, installation and surveys. Decades of offshore operations experience give us a holistic understanding of the maintenance cycle.

Corrosion laboratory & failure analysis

Ph.D scientists with offshore engineering experience and practical know-how working to solve real corrosion problems.

ANODE SYSTEMS

EXTERNAL PROTECTION

Deepwater's extensive cathodic protection design experience, specifically reviewing existing wind farm foundations, has shown that in an increasing number of cases it is not possible to provide adequate external protection to the entire monopile from the transition piece alone when using sacrificial anodes.

The convenience of attaching anodes to the transition piece has made it the first choice for designers, but without additional anode material near the sea bed, cathodic protection current will not reach the lower wetted sections or the buried pile.

Close mounted ICCP anode systems have also been utilised for applying external protection, however these are prone to damage and premature failure.

Deepwater have a proven product, for both retrofit and new build applications. RetroBuoy, a remote ICCP (Impressed Current Cathodic Protection) system developed for oil and gas platforms that has been refined for the offshore wind industry and is particularly suited to providing external CP to monopile and tripod turbine foundations. A remote ICCP system provides even, well distributed, cathodic protection current to the entire external structure including the buried sections and eliminates the possibility of overlocalised protection.

With a fully automated transformer rectifier power supply that can be monitored and controlled from the shore, the RetroBuoy ICCP system is a proven, reliable and robust solution to controlling external corrosion.

Complete systems can be installed within 72 hours based on a system with an ICCP sled, subsea DC cable, J-tube equivalent and associated clamp, cable protection and power supply unit, and are suitable for designs with failing ICCP close mounted anodes or insufficient sacrificial systems.



RetroBuoy, above, is a remote ICCP system developed for oil and gas platforms that has been refined for the offshore wind industry.

RetroLink, right, is a cost-effective cathodic protection system.



INTERNAL

Internal Cathodic Protection within the monopile must also be considered. RetroLink is a cost-effective cathodic protection system built with between 3 and 15 aluminium or zinc anodes cast directly on a heavy-duty wire rope. The RetroLink is attached mechanically and electrically to the structure above the water line, allowing the string to then hang in the seawater and deliver low levels of cathodic protection to the monopile interior or externally in low current demand areas.

Deepwater has extensive experience designing and retrofitting internal sacrificial systems with minimal manhandling offshore that can be incorporated into solutions providing extensive long life extensions.



Solar powered monitoring system.

POLATRAK® MONITORING SYSTEMS

Deepwater manufactures a range of instruments designed to allow operators to monitor external and internal cathodic protection and anode consumption offshore. A permanent monitor provides a constant, reliable stream of information about an asset's cathodic protection system.

Deepwater has provided external and internal monitoring packages to many wind operators including satellite, GSM, MODBUS and SCADA systems, where the data collected can be managed and handled on behalf of operators.

The importance of monitoring cannot be overstated, knowledge of the state of the asset enables corrosion engineers to plan ahead to react to any changing circumstances.

Polatrak instruments can be installed easily to monopiles and wired into the systems existing communications. They can also be incorporated into the transformer rectifier power supply units to enable closed loop control of the ICCP system. Deepwater have also provided powered monitoring systems independently from the turbine, by installing solar powered systems.

OFFSHORE SERVICES

Deepwater have a team of NACE and GWO certified engineers with working at height and confined space experience capable of inspection, survey and installation of internal and external cathodic protection and monitoring systems

We have experience diagnosing corrosion problems commonly found on offshore wind farm assets, Deepwater's engineers and CP designers can offer a solution.

Wind turbines pose some unique challenges. Working in confined spaces with limited loads makes the design of any retrofit system challenging, and the harsh environments can be extremely tough on materials.

By applying innovative designs used for other assets in similar conditions, Deepwater's proven offshore cathodic protection systems will protect wind monopiles in most locations.





RetroBuoy remote ICCP anode sled being overboarded.

CORROSION ANALYSIS

Deepwater have decades of offshore engineering experience and practical knowledge. For the offshore wind industry particularly, we can supply and carry out analysis on corrosion coupons, giving real data on the status of the corrosion prevention systems currently installed inside monopiles for example as well as providing fixed monitoring solutions with instantaneous corrosion data.

EXTENSIVE LONG TERM TRIALS

Deepwater work closely with operators to obtain the optional corrosion and CP data, and develop unique bespoke systems.

CASE 1

Deepwater started work on the Lynn and Inner Dowsing fields studying the internal concerns. Working with the operator this developed into a CP trial with remotely monitored corrosion and CP data by cell phone network to optimise any potential future retrofit. This project developed into a full blown internal CP retrofit with several remotely monitored CP systems.

CASE 2

Deepwater worked with the operator and provided a unique externally remotely monitored CP system solar powered for a monopile structure.

CASE 3

Deepwater worked with the same operator but with a tensioned monitoring system, on a monopile structure using specially developed concrete mattresses. Again the monitoring system is solar powered and data is captured automatically.

CASE 4

Deepwater carried out extremely extensive corrosion loss studies inside a number of turbines over six campaigns in 2 years.

The data captured from the above case studies provided valuable insight to the conditions of the inside of the monopiles and planning of the unexpected capital and operating costs for the future.





Deepwater has more experience protecting offshore assets than anyone else.

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