

# DEEPWATER

Deepwater designs and manufactures cathodic protection systems for offshore and marine assets, specializing in the development of innovative retrofit technology for aging assets in need of life extension.



## CATHODIC PROTECTION SYSTEMS

For nearly thirty years, Deepwater has developed and built technologies that offer more efficient and affordable alternatives to traditionally-installed anode systems. Our proprietary systems can be modified to suit virtually any asset and environment. While conventional sacrificial anodes are still viable for some new projects, they are often difficult and expensive to replace when they eventually

become depleted. For some new types of equipment located in deep water, installing anodes directly onto the asset is not an option. As offshore operations become more diverse, so do the cathodic protection systems required to protect subsea equipment. Deepwater has more experience designing and manufacturing systems to protect all types of offshore assets than anyone else.



## FIXED MONITORING

As operations move into deeper water and cathodic protection concerns intensify, a reliable way to monitor anode systems is essential. With permanent monitoring, asset integrity managers can more easily be alerted when an anode system isn't working as planned or when it is time to replace the original anodes. For new equipment, reference electrodes can be placed at critical areas

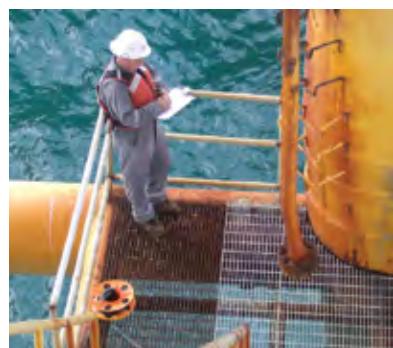
and data can be collected a number of ways. Often, the reference electrodes can be hard-wired to surface monitoring panels or data recorders that display the data. For deep and remote applications, Deepwater has developed the SunStation™ subsea display, which requires no outside power source or interface with the surface. Light from an ROV activates readouts that are captured via its camera.



## INSPECTION /SURVEY

Deepwater began conducting platform inspections in 1986, just before the BSEE instituted a 'Level I' inspection requirement. Since that time, we have continually focussed on improving the value of our inspection services. The basic format for most Level I surveys in the Gulf of Mexico was developed by Deepwater, and we are again driving innovation with our risk-based inspection procedures and

online reporting delivery database. These tools help operators focus their inspection spending where it's needed most, which ensures staff safety and keeps costs in check. Deepwater is a pioneer of 'true' underwater cathodic-protection surveys, developing techniques that give accurate cathodic protection readings more rapidly. Many older survey methods can waste time and provide meaningless data.

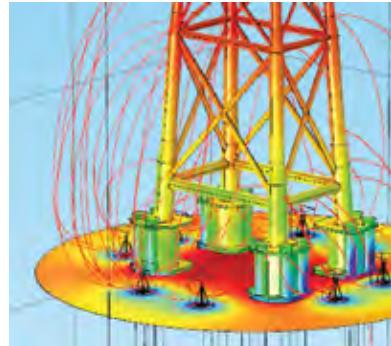


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## CORROSION ENGINEERING

As the energy industry grows more complex, so do the new challenges that continue to drive our corrosion engineers and designers. New depths, new life requirements and new materials create an ever-evolving mix of cathodic protection and corrosion mitigation issues that require experienced hands. Our seasoned staff of NACE-certified corrosion engineers are experienced in all aspects of

corrosion and materials science. We offer anode system design, third-party review services, anode testing, failure analysis, corrosion consulting and predictive modelling of future CP performance. No other company has a track record with offshore corrosion that matches Deepwater's. Our staff has extensive experience in real-time data interpretation and the use of a huge range of equipment.



## TANK CP AND MONITORING

The TankGard impressed-current tank cathodic protection system was developed by Deepwater in the mid-1980s specifically to address harsh-environment upstream-process tanks and vessels. The systems were pioneered in the San Joaquin Valley oilfields of California, where produced water is hot and sour and systems have a high tendency for scaling and sludging. Deepwater's TankGard

system can reliably protect tank and vessel interiors for up to 10 years. Robust reference electrodes constantly inform the system, which adjusts protection levels to maximise the use of the anodes and extend the life of the cathodic protection. Applications include process vessels and tanks, separators, heater treaters, seawater piping systems, surge tanks and seawater ballast tanks.



## POLATRAK PROBES

Polatrak probes are designed with dual reference electrodes for accuracy and interchangeable spare parts for service in the field. Unlike other cathodic-protection testing equipment, all Polatrak probes are designed with dual elements. Silver chloride electrodes provide the greatest accuracy offshore, but they can also require frequent re-calibration. Dual elements allows the technician to constantly

monitor calibration during the survey. If one electrode begins to drift, the survey can continue by calibrating with the second electrode. All of the internal electrodes and other components are interchangeable and easily replaced during routine maintenance. Our probes are available for every type of offshore survey: Topside drop-cell, diver-held contact and proximity, and ROV contact and proximity.



## I-ROD® PIPE SUPPORTS

Conventional pipe support designs trap water, which soon leads to corrosion that can eventually cause pipe failure. The shape of a cylindrical pipe on a flat surface forms a crevice where moisture gathers and can't evaporate. This softens the paint, which fails and causes bare steel to be constantly in contact with water. The resulting corrosion can cause rapid wall loss and eventual failure of the pipe.

Fortunately, I-Rod® provides a simple and inexpensive solution for this common problem. I-Rod® pipe supports virtually eliminate corrosion problems where pipelines and process piping contact pipe supports. It's been used worldwide for over 27 years and is specified by most major operators. There has never been a single reported corrosion failure at a pipe support when I-Rod® has been used.

