

Cathodic Protection & Monitoring

THE COMPLETE SOLUTION



MEASUREMENT

COMMUNICATION

INSIGHT



Cathodic Protection & Monitoring - an overview

A full range of cathodic protection and monitoring services, including consultancy, cathodic protection systems and insight into system performance.

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Consultancy

A comprehensive consultancy service, working with you from the initial stages of your project.

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Systems

Aquatec has a wealth of experience in supplying a range of cathodic protection systems; each individually designed, manufactured and supplied to meet the project requirements.

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Monitoring

Combining established cathodic protection measurement equipment with innovative, proven subsea communication technology to provide smart solutions for monitoring protection and current levels.

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Insight

Additional services to help you access and understand your data.

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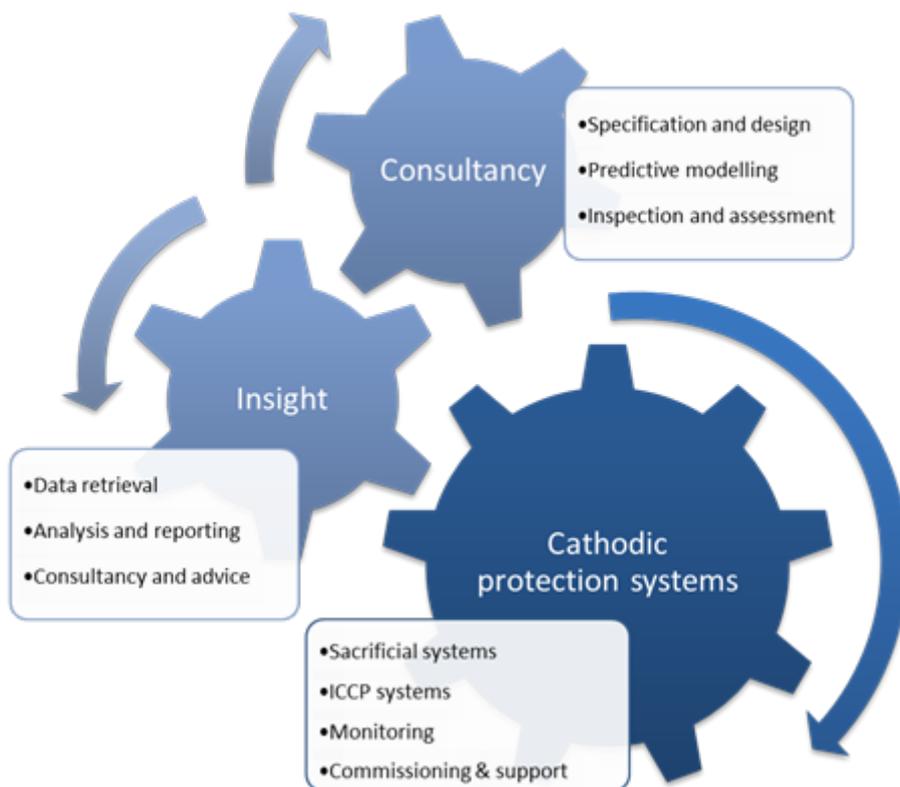
Aquatec was founded by the current managing director in 1990 as a specialist consultancy in oceanographic instrumentation design. In 1993, cathodic protection systems were added to the company's portfolio. Since then, Aquatec has developed and supplied instrumentation systems for cathodic protection and monitoring for installation on oil platforms, pipelines, jetties, and FPSOs from the UK North Sea to locations throughout the world.

Our portfolio ranges from the provision of cathodic protection design services, predictive modelling and inspection; the supply of ICCP and sacrificial systems and monitoring, with commissioning and support; to data gathering, interpretation and analysis services.

Aquatec personnel have extensive experience protecting offshore assets, with key personnel specifying, designing & manufacturing CP systems since the 1970s, and pioneering acoustic monitoring.

CATHODIC PROTECTION SERVICES

Aquatec Group offer a full range of cathodic protection and monitoring services, including consultancy, cathodic protection systems and insight into system performance.



Consultancy

Aquatec offer a comprehensive consultancy service, working with you from the initial stages of your project.

INSPECTION & ASSESSMENT

We provide fully trained and qualified engineers to inspect and assess your existing assets, and provide recommendations for their protection.

Our assessment methods are tailored to your requirements, incorporating our cutting edge technology solutions where appropriate. Platform inspections by qualified inspectors are available, as well ongoing monitoring solutions for subsea work.

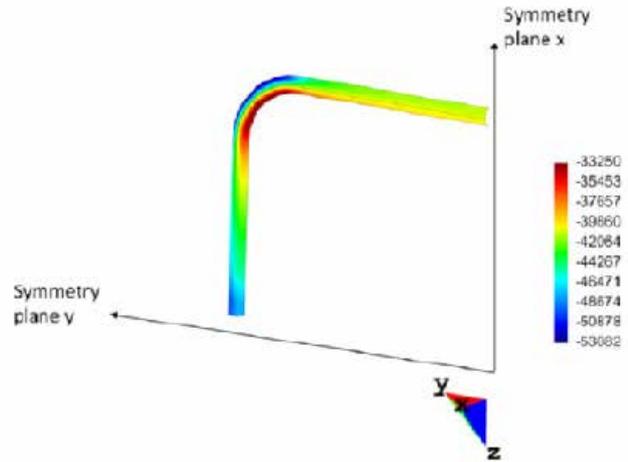
As well as short term assessments, Aquatec offer easily installable monitoring systems, allowing cathodic protection levels and/or currents at multiple points across a structure to be recorded over a period of weeks to months. Data can be logged, downloaded subsea using optical modems or transmitted to the surface in real time depending on the requirements. The gathered data can then be used to validate/ calibrate models and analysed to inform future action.



MODELLING

Aquatec offer a range of predictive modelling services to inform specification and design. Modelling can be carried out independently or in conjunction with our retrofit temporary monitoring equipment - CPmonitor systems can provide valuable data to validate and calibrate models, ensuring the most accurate foundation for permanent system design.

Incorporating modelling into the specification and design phase of work can help optimise the protection solution, especially if real time data is used to improve model performance. At Aquatec, we work with highly respected independent modelling specialists to deliver this service. When combined with our extensive system experience, you can be assured that the best solutions are being proposed.

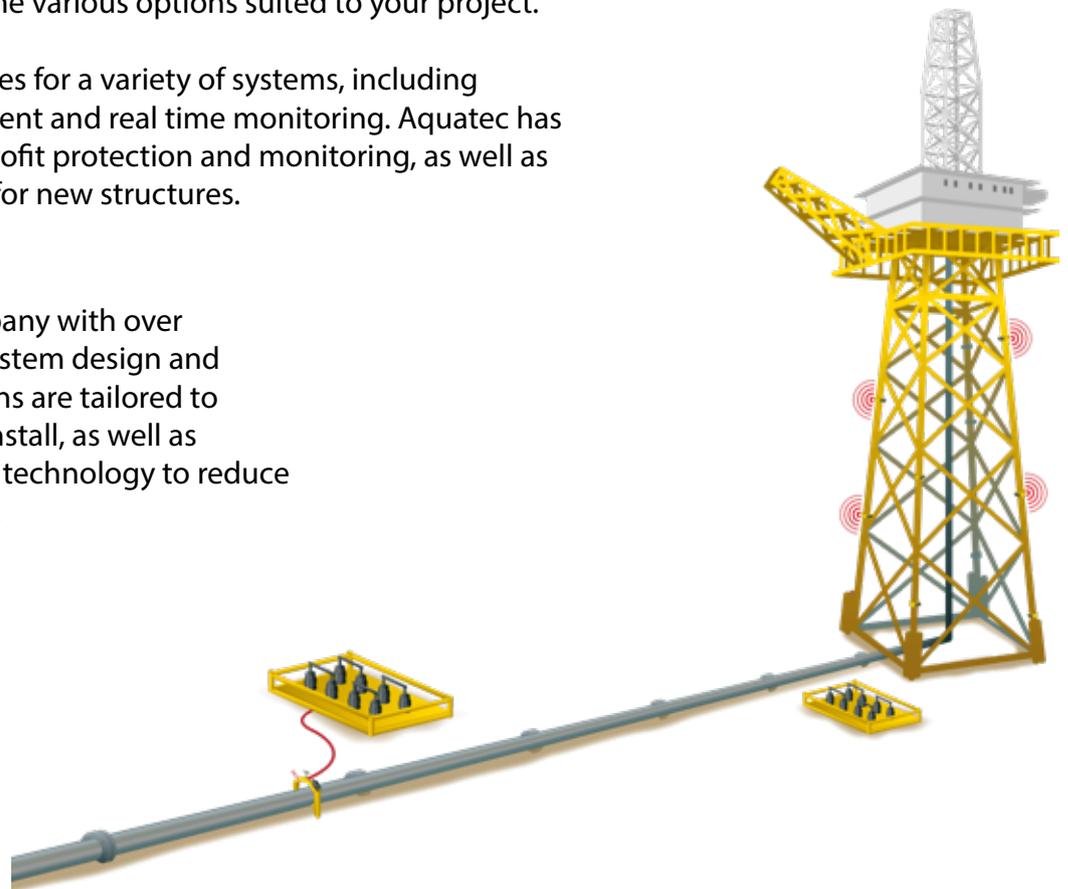


SPECIFICATION & DESIGN

Our experienced personnel will work with you to specify the level of protection needed and the various options suited to your project.

We provide design services for a variety of systems, including sacrificial, impressed current and real time monitoring. Aquatec has efficient solutions for retrofit protection and monitoring, as well as experience in designing for new structures.

As an independent company with over 20 years' experience in system design and delivery, Aquatec solutions are tailored to your needs and easy to install, as well as incorporating innovative technology to reduce costs and improve safety.



Systems

Aquatec has a wealth of experience in supplying a range of cathodic protection systems; each individually designed, manufactured and supplied to meet the project requirements. Systems can be retrofit or new, designed for a variety of assets including oil platforms, pipelines, jetties and FPSOs.

SACRIFICIAL SYSTEMS

Sacrificial anodes remain the solution of choice for most new offshore structures. Aquatec can supply sacrificial systems, either working with specified designs, or designing the complete system. We work with carefully selected suppliers to source the most suitable anodes for your project.

Aquatec's anode sled – the *AQUAsled* SCP – is ideal for retrofit systems. The ease of deployment and flexibility of location mean it is ideal for optimising the protection levels required.

Sacrificial systems can benefit from the addition of Aquatec's monitoring systems, allowing protection levels to be logged or transmitted in real time via acoustic modems. Recent developments include the option to download data subsea via ROVs using our optical modem systems – *AQUAmodem* Op1.



IMPRESSED CURRENT SYSTEMS



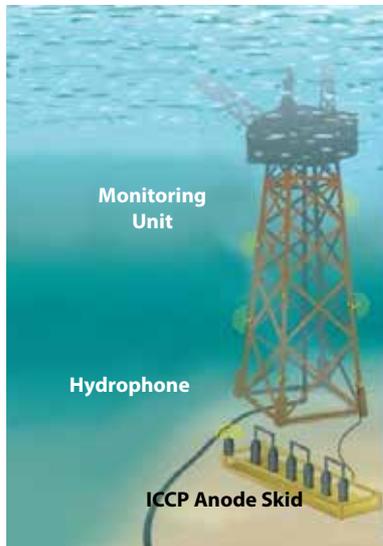
Impressed current systems provide an alternative protection solution to sacrificial anodes. They are suitable for both new structures and retrofit systems.

Impressed current systems allow an element of control that is not available with sacrificial systems, as the current supplied to the anodes can be varied. When combined with real time monitoring, ICCP systems become a powerful solution, as protection levels can be optimised automatically, thus minimising operational costs and reducing the risk of under or over protection, especially where high strength steel is present.

Aquatec's ICCP sled – the *AQUAsled* ICCP, allows simple deployment of ICCP systems for retrofit. Efficient design takes into account the deployment methods, so operational costs are minimised.

CPguardian - COMPLETE CATHODIC PROTECTION & MONITORING

For optimum cathodic protection and monitoring, Aquatec Group has developed CPguardian - a unique and cost-effective ICCP system that protects and monitors your offshore structure. CPguardian is ideal for extending the life of aging assets, making it a viable alternative to decommissioning. The fully integrated system has closed loop control, which provides impressed current cathodic protection and monitoring of the resulting protection levels in real-time.



Controlled PSU – manual and automatic control

In automatic mode, the PSU will adjust the current supplied to achieve the desired protection using the feedback from the AQUAmodem CP real-time monitoring units. Your current requirements are optimised to achieve the required protection using real data from across your structure. If manual control is preferred, the operator can set the protection levels and current required to achieve it.

AQUAmodem CP

The AQUAmodem CP is Aquatec's pioneering, intelligent acoustic communications device for the measurement and transmission of potentials or currents. The AQUAmodem CP offers an economical and reliable alternative to costly cables, and ensures consistent, long-term, fixed point monitoring. It reduces the need for diver or ROV intervention and provides measurements in all seasons and weather conditions. The instrument allows you to monitor remote sections of your structure or the performance of sacrificial anodes, and receive real-time data topside or on subsea data loggers.



Advantages

- Save money with increased knowledge, by optimising protection levels - not over-protecting the structure and not putting the installation at risk by under protecting it.
- Calibrate models by solving uncertainties in the model inputs.
- Benefit from knowing precise protection levels in all seasons and sea states at a fixed, known location.
- CP levels are measured at multiple points on the structure and transferred topside in real-time.
- No diver or ROV is needed after the installation of the system
- Each system is tailored to your project, to provide you with the best possible solution for your offshore structure.

COMMISSIONING & SUPPORT

A key part of our service is the provision of personnel for commissioning systems, providing regular inspection and maintenance, and analysing logged CP monitoring data. We have fully trained and qualified support engineers to provide yard and offshore support. As designers and manufacturers of the systems, we are best placed to provide operational and commissioning support.

With remote access telemetry, our support role can also be office-based. Our corrosion engineers can receive and analyse real-time data from offshore platforms and installations, and report directly to clients, typically within hours of significant CP events. This allows you to react quickly with the data you need to make operational decisions. Real time feedback of information also allows you to optimise your systems, thus minimising unnecessary spend and wasted resources.



Monitoring

Aquatec combines established cathodic protection measurement equipment with innovative, proven subsea communication technology to provide smart solutions for monitoring protection and current levels.

CP MONITORING SENSORS

We use high purity zinc electrodes, silver/silver chloride half cells, and precision current shunts to provide direct dual-sensing of cathodic protection potential, and precision monitoring of anode current. We also provide precision semiconductor assemblies to reduce protection potential in high strength steel applications to mitigate against hydrogen embrittlement that occurs during overprotection of the steel.



WIRELESS SUBSEA MONITORING

Aquatec engineers pioneered the use of intelligent acoustic communication for the retrieval of stored data from in-situ corrosion monitoring data loggers. Since 1998, our innovative AQUAmodem communication system and AQUAlogger data acquisition and logging systems, have been deployed as a cost effective and reliable method to monitor remote sections of pipeline or structure without using costly cables or risking diver intervention. With the latest send-and-forget AQUAmodem 500 instruments, as well as remote networking and satellite technology, we can also offer real-time reporting from monitored sites around the world, directly to your desktop.

AQUAmodem CP

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TEST EQUIPMENT

Ensuring that systems are set up correctly requires specialist test equipment, which has been designed specifically for CP monitoring applications. High current testers are used to calibrate shunt resistors for measuring sacrificial anode current.

CPmonitor - COMPLETE MONITORING SYSTEMS

Whether your current cathodic protection system is nearing the end of its life or routine surveys have detected inconsistent or declining protection levels, CPmonitor can measure real-time protection levels at multiple points across the structure over periods of months to years. This information can then be used to optimise cathodic protection levels, or make operational decisions, such as the installation of a new CP system or decommissioning.

Applications

- Optimising protection levels for existing structures
- Troubleshooting inconsistent protection readings from standard surveys
- Aid to decision making on the future of a structure – decommissioning or life extension
- Calibration of models



Advantages

- Save money with increased knowledge, by optimising protection levels - not over-protecting the structure and not putting the installation at risk by under protecting it.
- Calibrate models by solving uncertainties in the model inputs.
- Benefit from knowing precise protection levels in all seasons and sea states at a fixed, known location.
- Decisions on future CP requirements can be made with consistent, reliable data.
- CP levels are measured at multiple points on the structure and transferred topside in real-time.
- No diver or ROV is needed after the installation of the system.
- Each system is tailored to your project, to provide you with the best possible solution for your offshore structure.

RETROFIT SOLUTIONS

The AQUAclamp allows easy retrofit of real time monitoring units to existing subsea pipelines and structures.

The AQUAclamp is a robust frame, designed to fit onto submerged pipes and other structures. The user-friendly design makes it easily deployable by a diver or ROV, and is ideal for the retrofit of monitoring equipment. One diver or ROV can singlehandedly secure the AQUAclamp in place, with a simple push and twist installation process, using the ROV handle as necessary. It is available in a variety of sizes to suit the dimensions of the pipe.



Insight

Aquatec offer additional services to help you access and understand your data.

DATA RETRIEVAL

Aquatec real-time monitoring systems can provide the data you need direct to your office, avoiding the costly process of using divers or ROVs. We can also assist in the retrieval of logged data, using our subsea communication products such as optical modems.

ANALYSIS & MONITORING

In order to ensure ongoing protection, Aquatec offer a data analysis and reporting service. The need for this level of insight can be incorporated at the start of a project, or added in at a later date.

Experienced Aquatec personnel can monitor system health checks, download logged data or review real time data, and generate a report in which the CP data is analysed. As the designers, suppliers and installers of monitoring systems, Aquatec experts are ideally placed to offer insight into ongoing system operation. As the reports include an analysis of the data, benefits include optimisation of the system, reduction in waste and early identification of potential issues.

Aquatec offer the following on a regular basis (e.g. weekly):

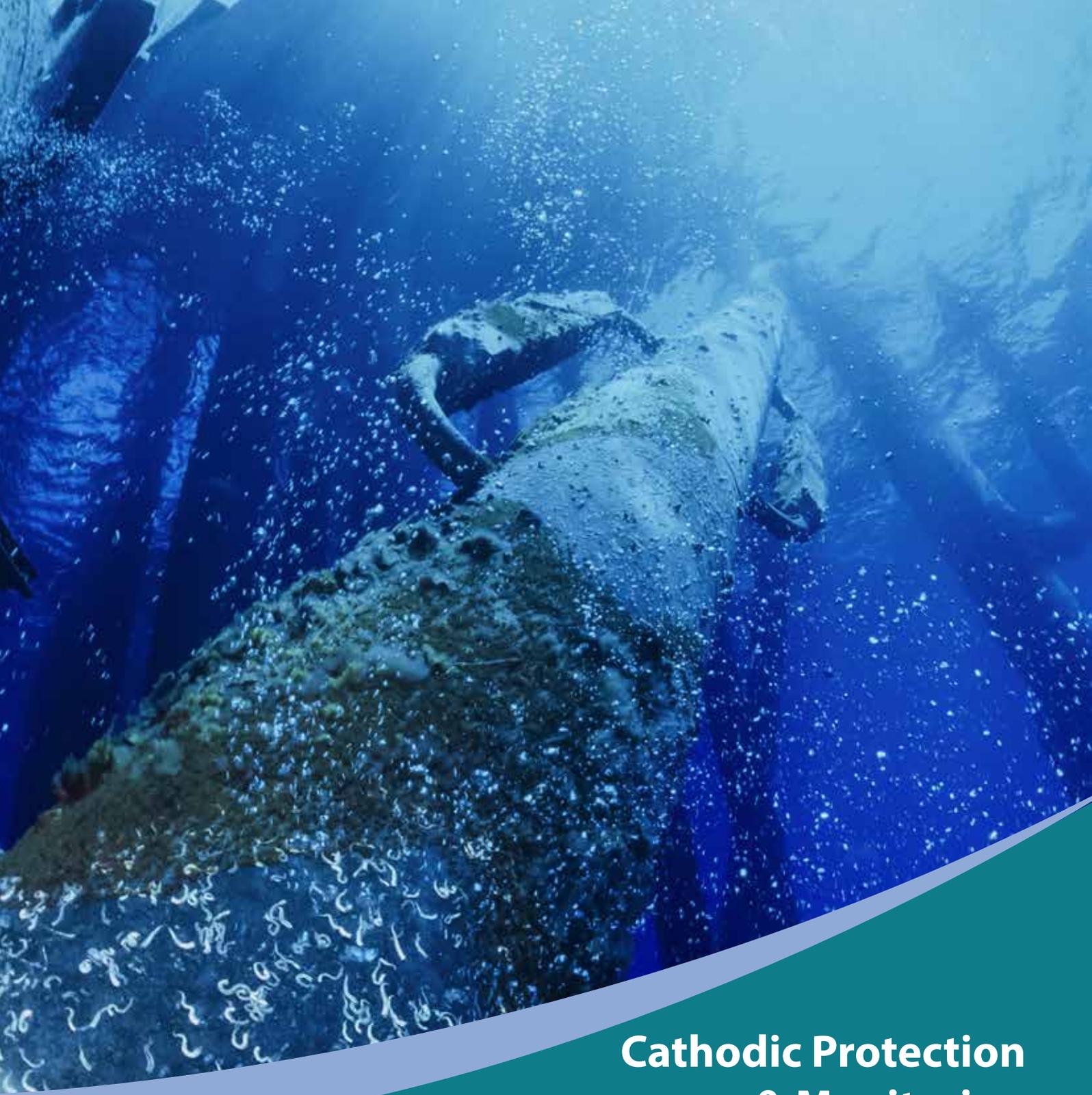
- Monitor system health checks
- Download logged data / review real time data
- Analyse downloaded data

The scope of analysis and report is tailored to your project, agreed in advance.

CONSULTANCY & ADVICE

Additional consultancy services and recommendations based upon data retrieval, interpretation and analysis are available.





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