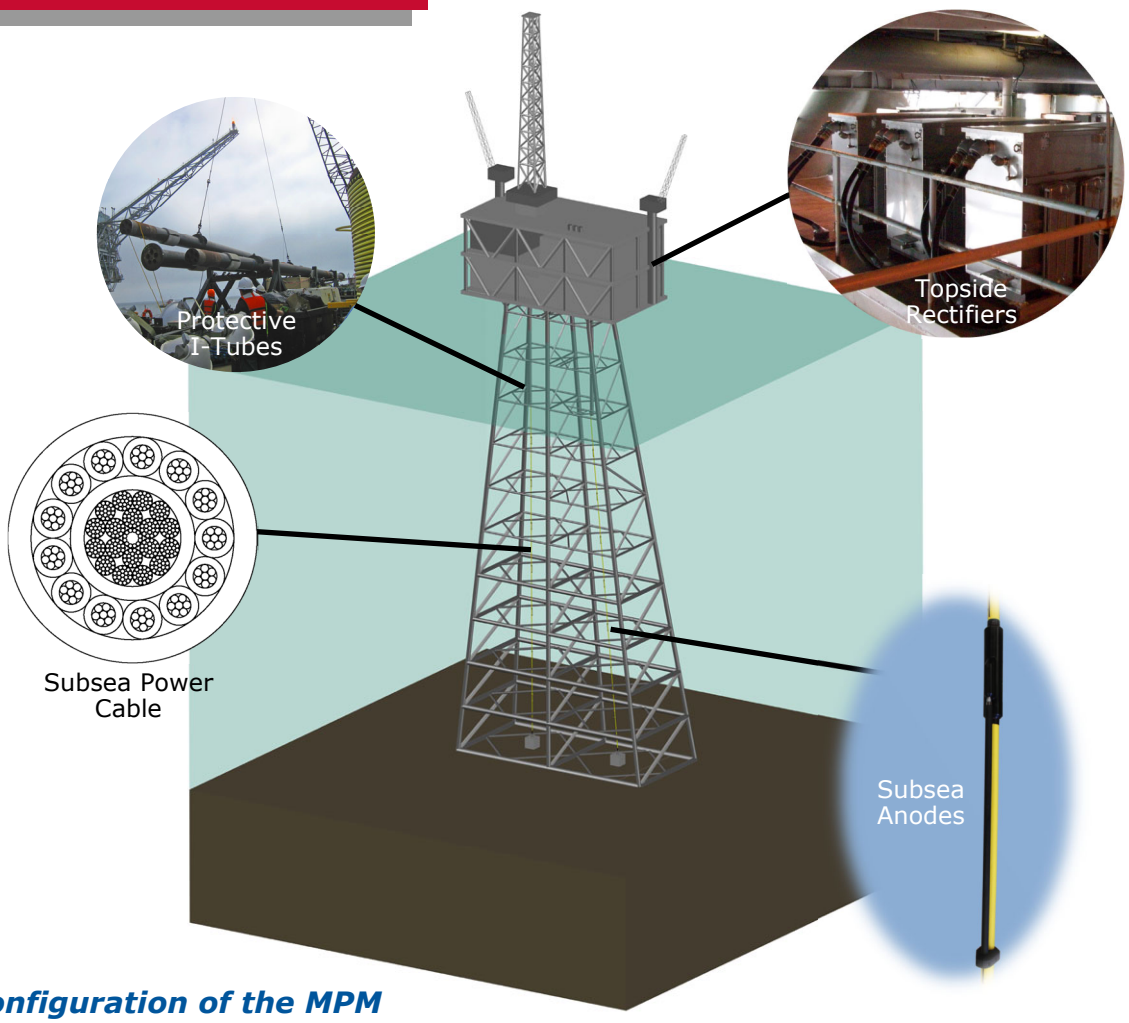
Extending your offshore facility field life?
Aging submerged assets?
We have your corrosion protection answers.

OFFSHORE FACILITY CATHODIC PROTECTION RETROFIT

MPM's system provides long-term subsea corrosion protection for standard jacket configurations (shown below), FPSOs, floating drilling and production systems, and associated pipelines.

MPM Deep Anode String (DAS) Cathodic Protection System



General configuration of the MPM Deep Anode String

MPM MARINE PROJECT MANAGEMENT, INC.

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MPM Deep Anode String Cathodic Protection System

The MPM Deep Anode String (MPM DAS) is *the* cost-effective, long-term retrofit solution for cathodic protection systems that must be installed inside a structure's perimeter under relatively benign environmental conditions. Its design avoids common issues in other systems that impact installation cost, long-term performance, and achievable depth.

Benefits of string anode systems include:

- √ **Proven Reliability** – String anodes have been used since the 1970s to retrofit shallow-water structures across diverse environments. Past failures typically result from inadequate splash-zone cable protection (lack of an I-tube), poor routing design, or improper anode string construction.

- √ **Lower Ground Bed Resistance** – Linear anode configurations minimize mutual anode interference, producing significantly lower ground bed resistance than clustered, parallel, or sled-based systems. This enables the use of lower-voltage rectifiers while still delivering the required amperage output.

- √ **Consistent Current Distribution** – Semi-remote tensioned string anodes provide excellent long-term current distribution.

MPM MARINE PROJECT MANAGEMENT, INC.

Why MPM Deep Anode String?

MPM's design incorporates decades of experience in cathodic protection system component design which includes advantages as follows:

Cost Effective

√ Requires no subsea maintenance.
√ Costs less than half of traditional CP retrofits.

Proven Design

√ Cable incorporates MPM's proven submarine power cable design which meets or exceeds ICEA requirements for submarine power cable.

Handling

√ The DAS can be spooled on standard cable reels, greatly reducing shipping, handling, and installation costs over conventional string anode systems that must be flaked out and boxed to prevent damage to the fixed anode.

Designed for Durability

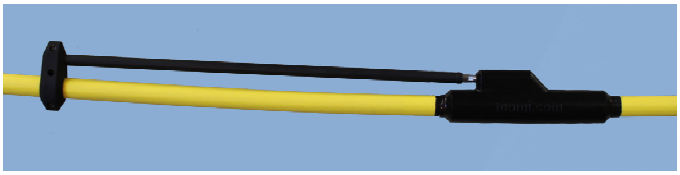
√ MPM DAS electrical connections and associated insulation waterproofing have been proof tested to 850-psi/1,900 FSW (581m).

Installation

√ MPM's procedures allow for the economical installation of DAS on shallow water platforms (-200 FSW/60m) without the use of divers or ROVs in some cases.

√ No oil filled junction boxes, which are prone to leakage.

√ MPM has the global depth record for ICCP retrofit of conventional jackets utilizing ICCP Sleds and DAS.

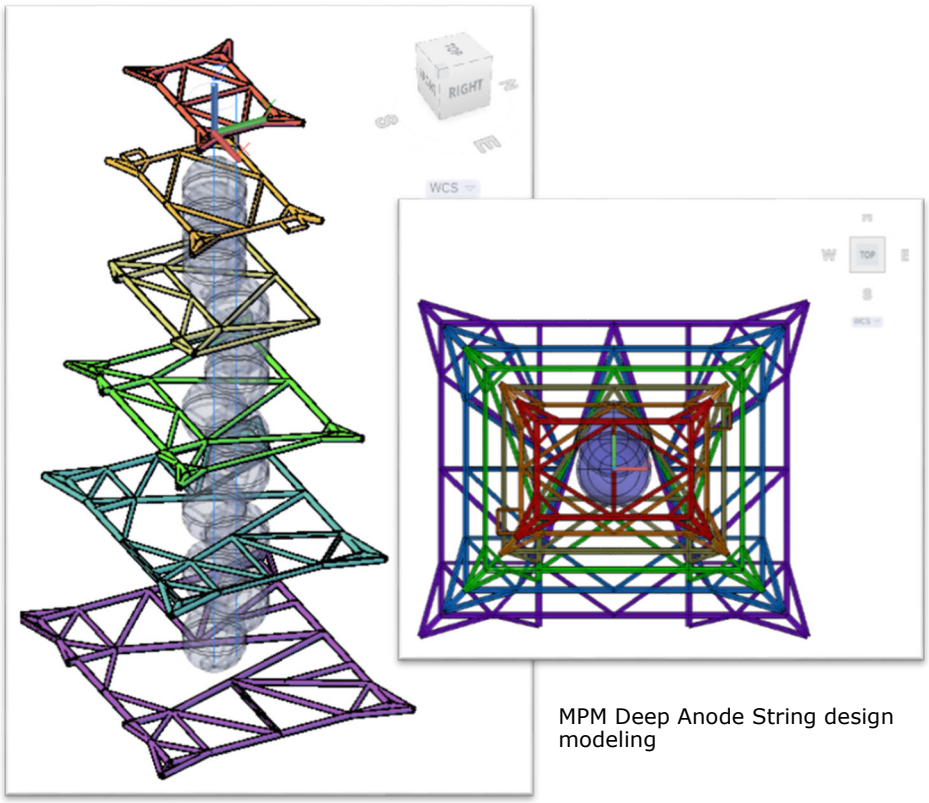


MPM Anode String Specifications

MPM Deep Anode String (DAS) Up to 60A per Anode—Up to 13 Anodes per String

Weight: Shipped = 4lbs/ft (6kg/m)
Anode Dimensions: 36" - 48" (91.5-122 cm) Cylindrical

MARINE PROJECT MANAGEMENT, INC.



MPM Deep Anode String design modeling

MPM Design / Build Advantages

Marine Project Management, Inc. is first a marine project management and engineering firm, and secondarily a cathodic protection specialist. Advantages in utilizing MPM are as follows :

√ MPM provides a one stop shop for the design, installation, commissioning, and maintenance of your system.

√ MPM understands that a CP retrofit is primarily a facility interface and logistics project and that the cathodic protection design, while important, is a minor component of the project.

√ MPM's design team generates 3-D models of the structure and appurtenances, defines cable routing and loading, and works closely with the owner's structural, electrical, operations, and HSE teams regarding equipment positioning and loading, electrical routing, and identifies logistics and construction constraints.

√ MPM understands marine construction and equipment capabilities and constraints, and is typically able to design the installation utilizing locally available resources.

√ MPM has the global depth record for ICCP retrofit of conventional jackets utilizing ICCP Sleds and DAS.

√ HSEQ – MPM has been in business since 1996 executing in excess of 1.9-million man-hours of operations without accident, incident, or environmental issue, and achieved ISO 9001:2015 certification.

MPM Cathodic Protection Services

CP Survey Services

MPM provides complete CP survey services, using the MPM Subsea Inspection Management System (SIMS). SIMS is a proprietary Windows-based software package integrated with specialized hardware which is used for underwater pipeline, outfall, or platform CP surveys. The system is ideally suited for close interval underwater potential surveys configured either as a towed fish, or interfaced with a remotely operated vehicle (ROV). SIMS is particularly well suited to perform interrupted and/or EFG surveys due to the system's high accuracy and sample rate.

MPM has successfully surveyed over 5,000 miles of underwater pipeline in the towed fish configuration, and over of 3,000 miles of pipeline in the ROV configuration.

SIMS Brochure

Existing CP System Evaluation

MPM evaluates existing jacket and/or pipeline CP system life using surface area calculations and performing comparative analysis of historical potentials and survey data. If supplemental CP is needed, MPM can evaluate the requirements to extend the existing facility's operational life.

ICCP System Design

√ Anodes — Output calculations, structural design, soil analysis, remote distance calculations, anode position scoping, etc.

√ I-tubes and I-tube Clamps — Location determination, structural design, installation appurtenance design, CP design, fabrication drawings, etc.

√ Submarine Power Cable — Electrical, structural, catenary, VIV analysis, etc.

√ I&E Design — Interface with the owner's I&E staff to complete the I&E design utilizing MPM interface components.

√ Structural Evaluation — Local analysis and interface with the owner's structural support team for global analysis.

System Installation and Commissioning

√ Installation Planning/Facility Interface — MPM is ideally suited to plan installation of MPM cathodic protection systems. We are highly proficient in installation operations utilizing diving and ROV equipment, construction support vessels, rigging, and all associated equipment and personnel requirements. Further, we are familiar with drilling and production operations, allowing us to interface with the facility team during development of the execution plan, risk assessments, etc.

√ System Construction and QA — MPM utilizes its Inspection & Test Procedures (ITP's) for installation aids, rigging, and installed system components.

√ Topside Construction Operations — MPM can subcontract the topside work directly, or preferably, interface with the owner's topside construction team.

√ Marine Construction Operations — MPM will subcontract and manage the marine construction work for installation of MPM cathodic protection systems. This provides the owner with one qualified contractor retaining care, custody, and control of the system throughout the project.

√ System Commissioning — MPM trains owner facility personnel in system operation and maintenance concurrent with the start up and commissioning operations.

MARINE PROJECT MANAGEMENT, INC.

MPM Safety

MPM has a **100% accident free** safety record, and has extensive experience in successfully planning and implementing projects in the environmentally sensitive waters of Alaska, California, and the Gulf of Mexico.

MPM Safety Statistics

MPM Founded: 1996
Years of Business: In excess of 20 years
Total Hours Worked: Over 1,900,000 hours
Accidents or Incidents: 0

MPM Recognition

MPM has received an audited "A" contractor rating from Chevron, and a "Project Excellence" Award from Plains Exploration and Production (PXP).

Method

MPM places the highest priority on completing all operations safely. To ensure that all operations are completed without accident or incident, we have developed and implemented an active behavioral based health, safety, and environmental (HSE) program.

Quality Policy

As a Project Management and Cathodic Protection Services Company we are committed to satisfying our clients by providing quality products and services. Our quality objectives are met by continuous employment of internal and external system improvement. Activities are carefully planned, managed, executed and controlled to exceed minimum contractual requirements. We learn from our experiences and from each other. We document these lessons and use them to continuously improve our systems.

Quality Management

The Marine Project Management, Inc. Quality Management System was registered as compliant with the of International Standard Organization ISO 9001:2015. To meet this standard, we adopted a process approach to develop, implement, and improve the effectiveness of our Quality Management System to consistently provide services that meet our Mission Statement.

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