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or

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mjrcontrols.com

MARINE ELECTRICAL ENGINEERING

Power & Automation Systems Retrofit, Upgrade & Servicing



MJR Power & Automation

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Why Choose MJR

With over 25 years experience in the Marine Electrical Power & Automation field, MJR is your no. 1 choice for marine electrical and automation system service, repair and retrofit.

From troubleshooting, repair and service of existing systems to complete turnkey retrofit systems, MJR Power & Automation is on hand to provide the right solution, whether for a Commercial Marine Vessel or a complex Offshore DP3 Construction Ship.

 Survey, Inspection & Testing

 Engineering & Design

 Project & Risk Management

 In House Design & Build

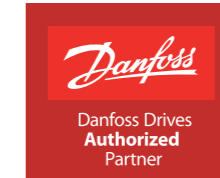
 Retrofits & Upgrades

 Automation, Electrical and Electronic Services

 Installation & Commissioning

 After Sales Service

Industry Partners

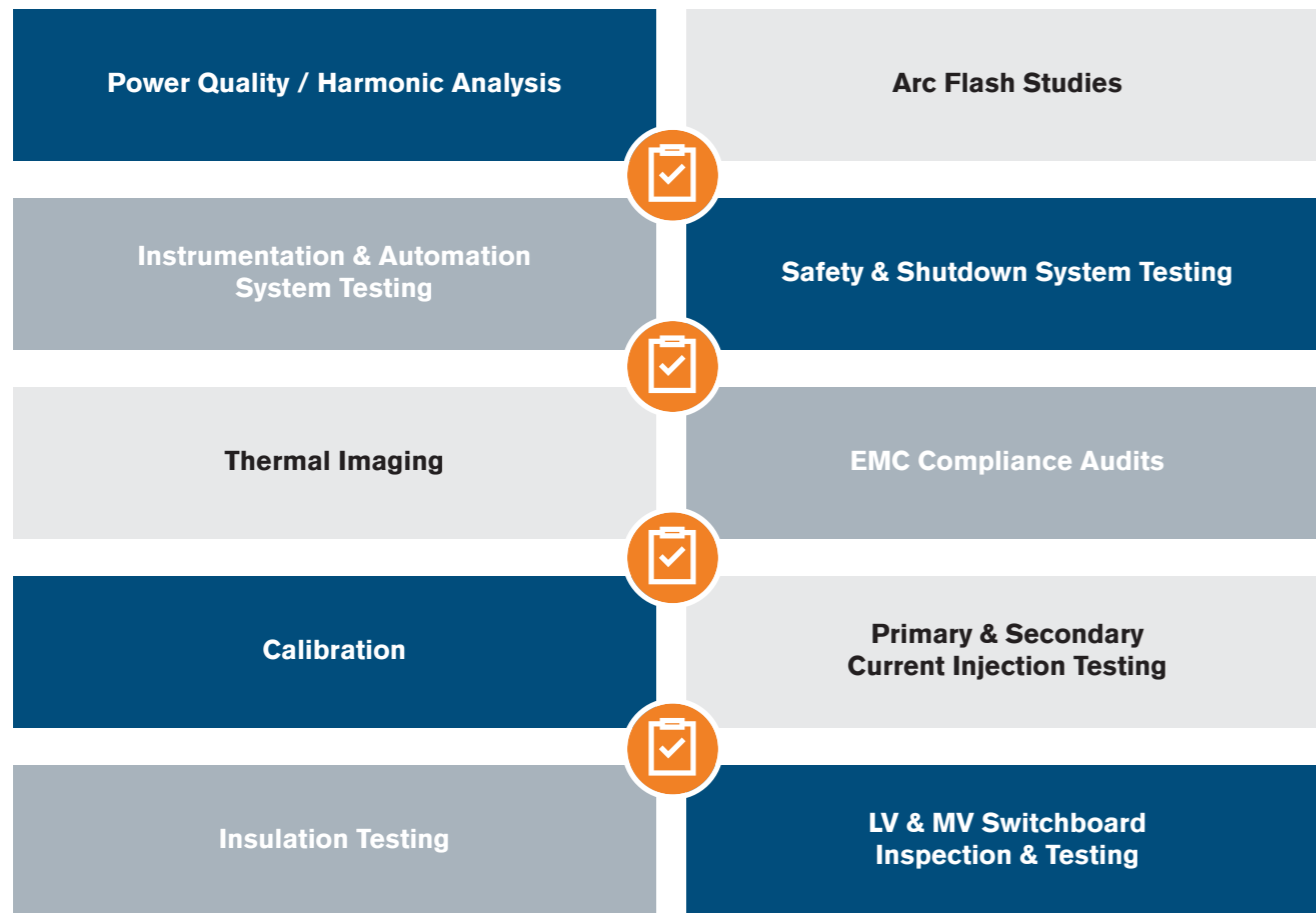


Survey, Inspection & Testing



Safety in our hands - why wait until it's too late!

MJR Power & Automation offer independent surveys, inspections and onboard testing, as well as equipment testing in our extensively equipped workshops.



Engineering & Design



System Design & Analysis

We provide an extremely broad range of engineering services encompassing virtually every aspect of marine electrical power, automation and electronic engineering. Each individual area is covered by in-house specialists in their particular field with a wealth of experience and knowledge. This enables us to provide a true 'end to end' engineering solution, from simple repairs to complex turnkey design, build, installation and commissioning projects.

Our design services include:

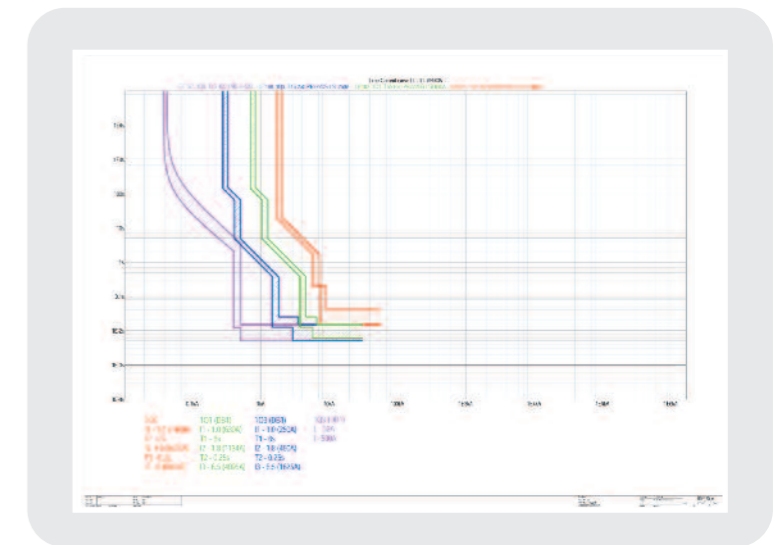
- FEED
- Concept Design
- Production of Specifications
- Detailed Design
- System Modelling
- Safe & Hazardous Areas Design
- Protection & Discrimination Studies
- FMEA/FMECA
- Cost Engineering
- Class Approval

Design Calculations

Whether it's for a single circuit or a whole installation, we ensure all our design work is fully backed up with design calculations - all of which comply with Classification Society Rules for Ships and Offshore Units.

Examples are:

- Load Balance
- Short Circuit Calculations
- Volt Drop Calculations
- Busbar Strength Calculations
- Harmonic Calculations
- Load Flow & Transient Stability Calculations



Protection Study



DID YOU KNOW?

MJR has a dedicated marine service team operating worldwide

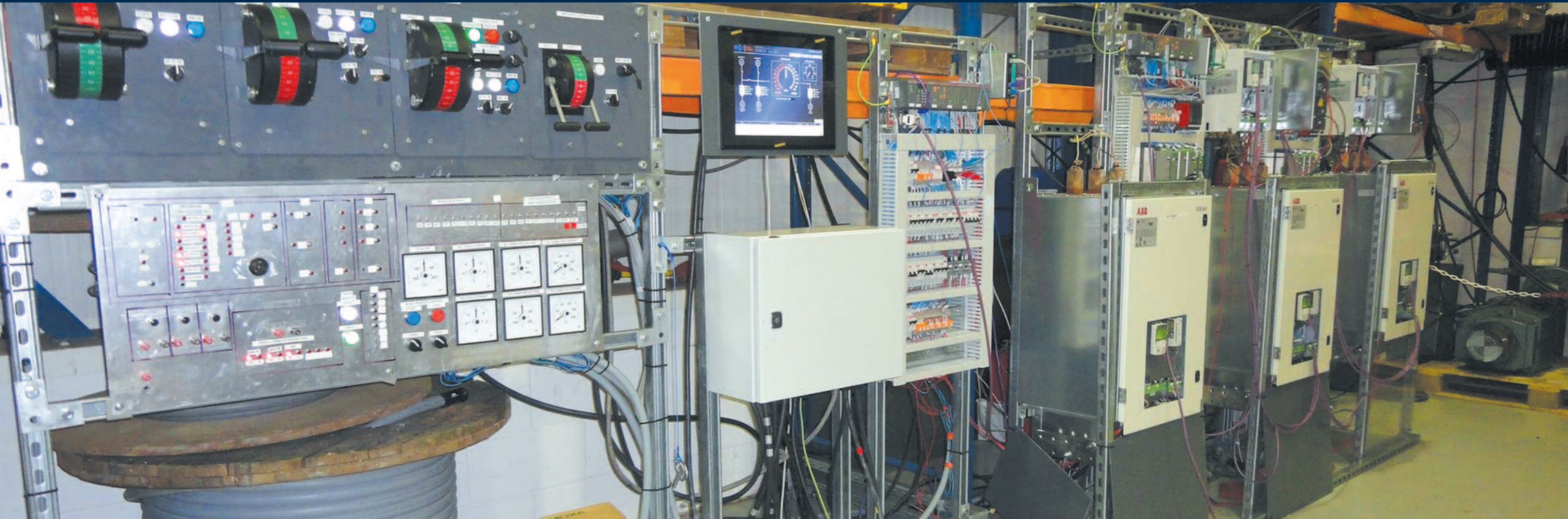
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Project & Risk Management



In House Design & Build



Managing Risk

MJR heavily invests in 'offline' R&D to support upcoming projects and to strengthen the company IP, skills, knowledge and capability. R&D is not generally permitted inside a 'live' project with schedule and budget constraints, due to the inherent risk to both MJR and our customers.

High focus is given to risk on the basis that the customers risk is also MJR's risk and every effort is made to ensure a 'right first time' turnkey delivery approach. This unique value proposition provides added value to the Customer as it offers the removal of supplier interfaces and therefore further mitigates Customer's risk.

On Time Delivery - Right First Time

Reducing down time, removing and managing the risk throughout the project.

Past experience proves MJR Power & Automation can deliver what others deem to be impossible, by previously delivering a full main electrical propulsion and thruster drive upgrade in less than 16 calendar weeks (including the Christmas holiday period) from contract award to successful completion of sea trials with full class approval of the system upgrade.



Retrofit & Upgrades



CASE STUDY: SV Corystes

Replacement of Main Propulsion and Thruster DC Variable Speed Drive & Control System

MJR won the contract to replace the system due to our strong track record in power generation and propulsion systems. Installation, commissioning and testing time on board was very limited, with the complete removal of the old system and installation and commissioning of the replacement system taking only two weeks from arrival of our team on board to successful sea trials. In order to de-risk the project and meet such an ambitious schedule the following steps were taken to minimise installation and commissioning time:



Drives Page



Diagnostics Page

- Design and prebuild of the system into a series of modular replacement chassis plates designed to be a drop in replacement for the existing equipment. Including extensive use of 3D modelling.
- Construction and hook up of the full system in MJR's facility including design and build of 'dummy' Propulsion Control Stations and simulation of other retained equipment and interfaces on the ship that the system had to interface to.
- Extensive and careful testing of the complete system with the 'dummy' ship interface and test motors to ensure 'right first time' functionality.
- Installation with MJR's in house team that has extensive experience in retrofitting complex systems to existing vessels under challenging conditions.



DID YOU KNOW? MJR has extensive in-house software, control, electrical and electronic system design capabilities

Retrofit & Upgrades



CASE STUDY: SV Corystes

Benefits of the upgraded system include:

- Simple intuitive operator interface with easy to read diagnostics making operation and fault finding much faster and simpler than with the original system.
- Modern digital drives that give vastly improved motor dynamic performance and improved reliability and maintainability.



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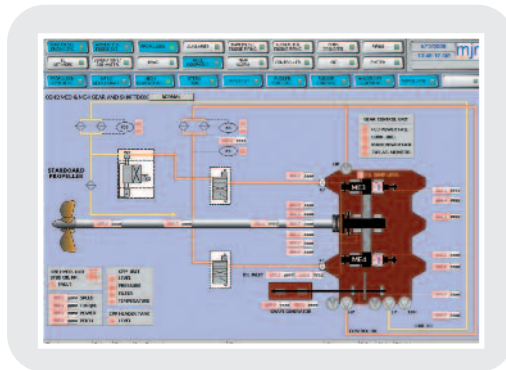
Retrofit & Upgrades



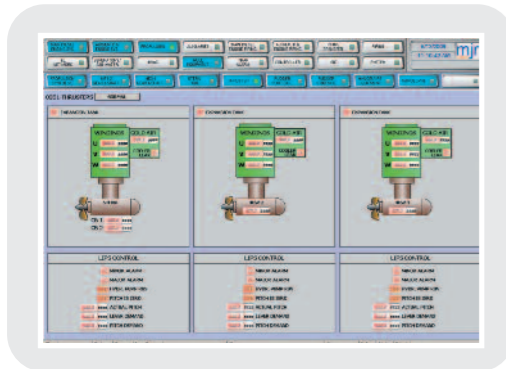
Main Propulsion & Dynamic Positioning

MJR has a wealth of experience designing and implementing solutions for marine propulsion, from medium speed four stroke propulsion engine control with controllable pitch propellers to large AC and DC drives for Diesel Electric Dynamically Positioned Vessels.

We are authorised marine and offshore partners with the main global players in the marine electric propulsion market, including ABB, Siemens and Vacon (Danfoss) and can provide solutions including:



Main Propulsion



Thrusters

- Large AC & DC Low Voltage and Medium Voltage Propulsion Motor Drives
- Energy Storage & Hybrid Propulsion Systems
- Symmetrical & asymmetrical mechanical load sharing of Engines coupled to common Gearboxes
- Load control & overload protection
- Clutch & Auxiliary Machinery control
- Power take off for Shaft Generator applications and power take in for Auxiliary Propulsion 'take home' and 'boost' modes
- Constant Frequency Shaft Generators
- Combinator & constant speed control
- Interface to Dynamic Positioning systems



Retrofit & Upgrades



Retrofit Solutions

Our services range from the prime mover to the propulsion motor, including repair and upgrade of the existing generator excitation systems through to complete retrofit solutions. We can cover all generator maintenance and repair work.

Our team of very experienced technicians operate worldwide to resolve all types of generator and motor problems and we're often called after many others have failed to find a solution.



Ship Automation

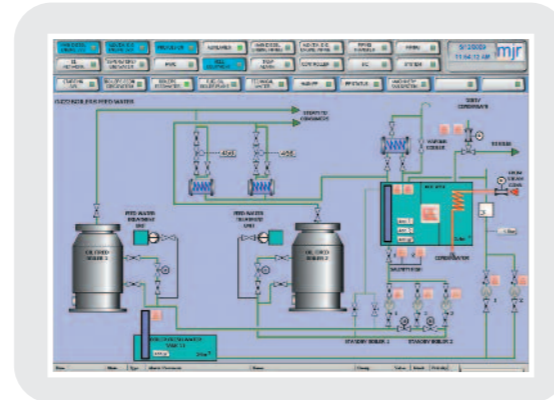


Alarm & Monitoring

Cost effective retrofit solutions for alarm & monitoring

From stand alone engine bearing monitors with a handful of analogue channels to integrated multi-operator station distributed systems with up to 60,000 I/O channels and fibre optic backbone, we install systems that are highly modular, scalable and configurable for any marine application.

We can provide industry standard well known systems from our Global Marine Partners or for more bespoke applications we can design PLC/HMI/SCADA based equipment tailored to a specific need. With close ties to all of the main Marine Classification Societies we handle the whole project from concept through to installation and commissioning including Class Approval.



Auxiliaries

Machinery Control

MJR has an enviable track record and reference list of delivery of Control and Automation Systems covering all main and auxiliary machinery onboard ship. Some examples are:

- Machinery Monitoring & Alarm Systems
- Main Engine Control & Safety Systems
- Propulsion Control
- Auxiliary Engine Control & Safety Systems
- Pump, Fan & Valve Automation
- Tank Contents Gauging
- FW & SW Cooling Systems
- Fuel & Lube Oil Systems
- Purifiers
- Technical Water & Potable Water Handling
- Grey, Black Water & Sewage Treatment
- HVAC
- Bilge & Ballast
- Dredging Systems
- Ballast Water Treatment
- Exhaust Gas Scrubbers
- Cargo Handling
- Vehicle Ramps & Elevators

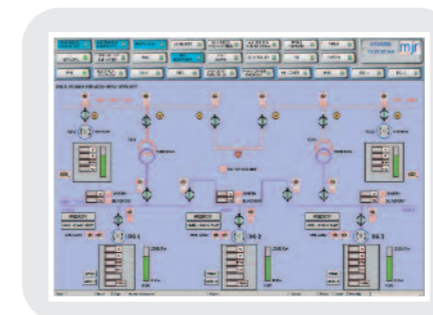
Electrical & Electronic



Electrical Power & Electronic Systems

Services included design, build, installation and commissioning of:

- Generator Excitation & Load Sharing Systems
- Large Variable Speed Propulsion Drives
- Variable Speed Drives for Energy Saving
- Power Factor Correction
- Star-Delta, Autotransformer & Soft Starters
- Generator Control & Synchronising Panels
- Main Switchboards & Switchboard Modifications/Extensions
- Main Switchboard & Switchgear Upgrades
- Generator Replacement
- Portable Containerised Deck Generator Installations
- Deck Power Distribution
- CCTV Systems
- IT, Security & Access Systems
- Crew & Passenger Entertainment Systems
- Telephone, Talkback & Intercom
- Fire Detection & Suppression
- Deck Cranes & Deck Winches
- Bridge & Navigation
- Dynamic Positioning Systems
- Shore Power Voltage & Frequency Converters
- Remote Monitoring & Diagnostics



Power Management

Power Management

We have successfully delivered and retrofitted a wide range of Power Management Systems, in applications ranging from Factory Trawlers to Dynamically Positioned Offshore Construction & Survey Ships.

Our Standard MPS features include:

- Automatic synchronising, connection, electrical and engine/prime mover monitoring & protection
- Symmetrical and asymmetrical active (kW) load sharing
- Load dependent start/stop and heavy consumer start request and blocking
- Blackout Prevention & Load Limiting
- Standby start with programmable machine priority and blackout restart of essential equipment



DID YOU KNOW? MJR is accredited by Lloyds Register for its management systems that include ISO9001, ISO14001 & OHSAS18001

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Installation & Commissioning



Experience & Knowledge Count

Put your trust in our hands

Skill, experience and knowledge are paramount when installing new systems alongside existing older equipment. Lessons learned are an important factor, especially when operating in the relatively complex area of retrofit and life extension projects where installation time is limited and testing time is short. Solutions have to be proven and pretty much right first time as there is little time for remedial action. With a rich library of reference designs and proven solutions MJR is a safe pair of hands.

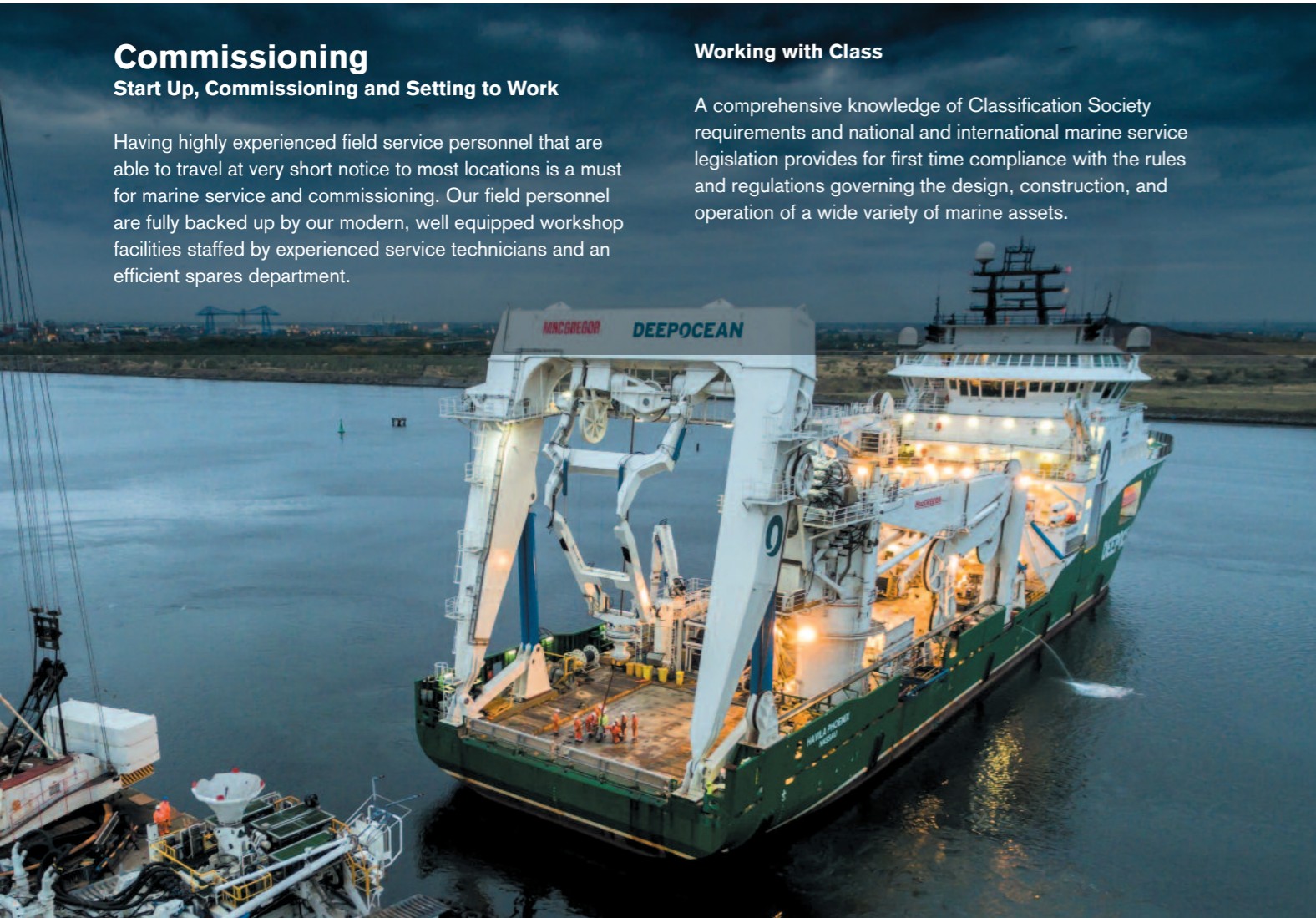
Commissioning

Start Up, Commissioning and Setting to Work

Having highly experienced field service personnel that are able to travel at very short notice to most locations is a must for marine service and commissioning. Our field personnel are fully backed up by our modern, well equipped workshop facilities staffed by experienced service technicians and an efficient spares department.

Working with Class

A comprehensive knowledge of Classification Society requirements and national and international marine service legislation provides for first time compliance with the rules and regulations governing the design, construction, and operation of a wide variety of marine assets.



Installation & Commissioning

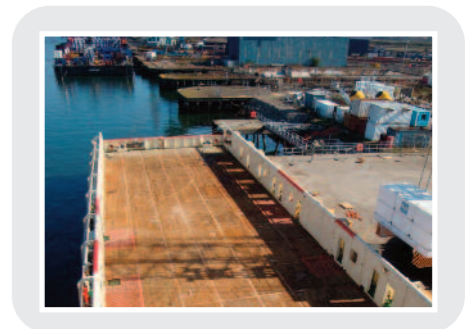


CASE STUDY: Vessel Mobilisation

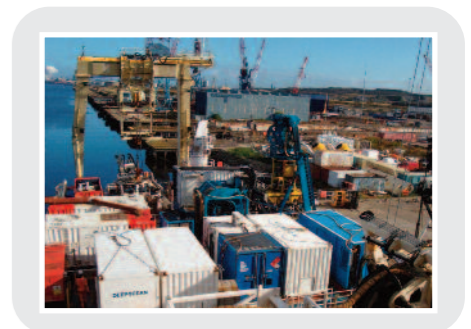
Vessel Mobilisation & Project Support

MJR provides a full range of Vessel Mobilisation and Marine Electrical Engineering Services to support the mobilisation of Offshore Construction projects. From consultancy, design and class approval through to complete installation and commissioning, MJR can provide a full turnkey vessel electrical modification and mobilisation services package.

- Power Distribution System Design, Installation & Commissioning for 3.3kV, 690V, 440V, 230V & 110V Vessel Networks
- Main Switchboard Modifications, Manufacture & Installation of Permanent Deck Power Distribution Systems
- Installation of Temporary Containerised Generator & Power Distribution Systems
- Electrical Load Analysis
- Short Circuit Calculations
- Protection Studies including Selectivity and Co-ordination Analysis
- Design, Installation & Commissioning of Clear-Comms, Data, CCTV, Survey, Lighting & Fire Detection/Suppression Systems
- Design, Installation & Commissioning of Power Management Systems Interface to Deck Equipment Heavy Consumers
- Design of Cable Management Systems, Cable Penetrations & Cable Schedules
- Installation of Deck Equipment including: ROVs, Trenchers, Plough Systems, Towing & Deployment Winches, Dive Systems, Cable Lay Spreads, Umbilical & Pipe Lay Spreads
- Class Approval and Certification of all modifications under challenging conditions



Before



After





After Sales Service



We provide UK and worldwide spare parts and after sales service for our systems, third party systems and for partner products that are integrated into our solutions via a dedicated factory trained marine service team.

We are the UK service centre for Hyundai Heavy Industries and Samsung Heavy Industries, two of the world's largest shipbuilders and offer service for their marine product range as follows:

SERVICE SUPPORT FOR:



- HiVDR Voyage Data Recorder
- ACONIS 1000 Integrated Monitoring & Control System
- ACONIS 2000 Integrated Monitoring & Control System
- ACONIS PMS (Power Management System)
- Moulded Case Circuit Breaker (MCCB)
- Air Circuit Breaker (ACB) – HAT, HiAS, HiAN
- Vacuum Circuit Breaker (VCB)
- LV & MV Main Switchboards
- Generators & Excitation Systems
- Propulsion Motors
- SVDR BASIC
- SVDR 3000
- SVDR N
- SVDR PRO (Including Jotron, L3 & Netwave Capsules)
- SSAS 21 Integrated Monitoring & Control System
- SSAS 21B Integrated Monitoring & Control System
- SSAS 21C Integrated Monitoring & Control System
- Samsung SSAS Pro Integrated Monitoring & Control System

Delivery & Safety Assured



- ✓ **Quality & Safety Assured with Approved Management Systems**
- ✓ **Flexible, Committed and Professional**
- ✓ **Marine Classification Society Approvals**
- ✓ **Fully Trained Installation & Commissioning Engineers**
- ✓ **Through Life Support**
- ✓ **Rapid Deployment of Experienced Personnel offering global coverage**
- ✓ **Excellent Industry knowledge backed up with support from Global Partners**

