Quoceant

Experts in Marine Energy and Technology Innovation

Quoceant are engineering consultants specialising in marine renewables and technology innovation.

Our long background in the marine energy sector gives us a rare combination of hands-on experience, knowledge, and capability applicable to the wind, wave, tidal, and wider maritime and renewable sectors.

Quoceant go beyond the typical consultancy service with our fresh, informed, and innovative approach to multi-stranded engineering projects.

We provide independent engineering and consultancy services from concept through to detailed design, qualification, build, and operations support.

Our core areas of expertise are:

- Mechanical and structural design and analysis
- Mooring systems and marine connection systems
- Offshore operations planning and storyboarding
- Power take-off and control systems
- Numerical modelling and simulation
- Marine electrical engineering
- Third party review and due diligence
- Whole system innovation and design

Services

Mechanical and Structural Design and Analysis.

Our team are experts in marine structures and understand the complex loading and challenging conditions the ocean environment brings.

We are experienced in designing to offshore codes and standards, and in using Abaqus and SolidWorks.

“Quoceant have provided engineering services to support Ocean Winds across both our Moray East and West projects. I’ve found the team to be highly knowledgeable in structural analysis and design. Responsive, professional and open - they have been straightforward to work with.”

Teit Schoenberg, Ocean Winds

Our expertise includes:

- Design for Steel and Aluminium Structures
- Design of temporary structures and tooling
- Linear and non-linear FEA
- Fatigue and wear analysis
- Concept Design Development and Evaluation
- Mooring Systems and Marine Connection Systems

Innovation Offshore

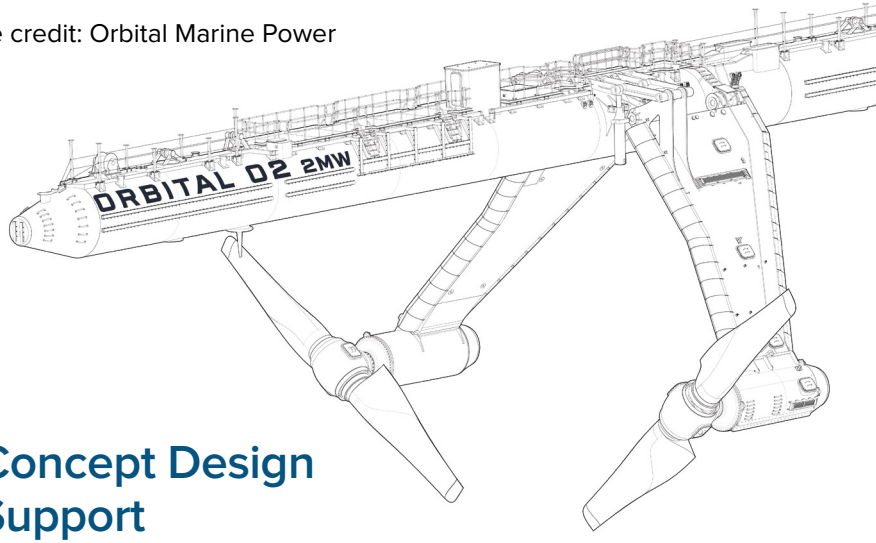
Image credit: Moray Offshore

Engineering Support

Moray West Offshore Wind Farm

Quoceant are working with Ocean Winds on the design of temporary structures for the installation of their 14.7MW wind turbines, and to provide general third-party engineering support and analysis on the substructures for the turbines.

Image credit: Orbital Marine Power



Concept Design Support

Orbital Marine Power

Quoceant worked with Orbital Marine Power to invent and develop new features which grant access to nacelles for maintenance and reduce the cost of structures.

Services

Marine Operations Design and Connection System

The marine environment can be a hostile place.

Effective marine operations strategies must be developed early so that methods and tooling can be properly integrated into the complete design solution.

Quoceant have extensive design and practical experience across a range of offshore technologies. We also understand the interactions between the cost of different offshore operations strategies and the availability that can be achieved. Our services include:

- Storyboarding and concept evaluation of marine operations
- OrcaFlex analysis
- Cost-benefit modelling of Operations and Maintenance (O&M) strategies
- Marine connector design offering dual or individual mechanical and electrical connection

"The Quoceant team bring their real-world experience and ingenuity to bear on the challenge of deploying and maintaining novel technology at sea. We were very happy with their work."

Ben Yates, Consultant & Director, Tension Technology International Marine Renewables.

Q-Connect: Enabling technology for marine connections

The Q-Connect is an innovative Quick Connection System for marine applications, designed by Quoceant. A set of modular subsystems can be combined in different configurations to provide quick, safe, and low-cost mechanical and electrical connection in one operation. It is applicable to a range of marine energy devices. Q-Connect development has been supported by Wave Energy Scotland funding and is currently undergoing full-scale qualification testing ahead of at-sea operations. Learn more at **www.quoceant.com/q-connect**

Image credit: MeyGen

Cable Management System Design

Andritz Hydro Hammerfest

Quoceant provided engineering design, analysis and procurement support for the cable management and subsea connection system for the MeyGen project in the Pentland Firth.

Connection System Design

Minesto

Minesto contracted Quoceant to design a subsea quick connection system for use on their tidal kite technology. The solution provides dual mechanical and electrical connection between the kite and its bottom mounted foundation and subsea cable. The system was successfully installed and operated in the Faroes Isles in 2020 and a second unit was ordered a year later.

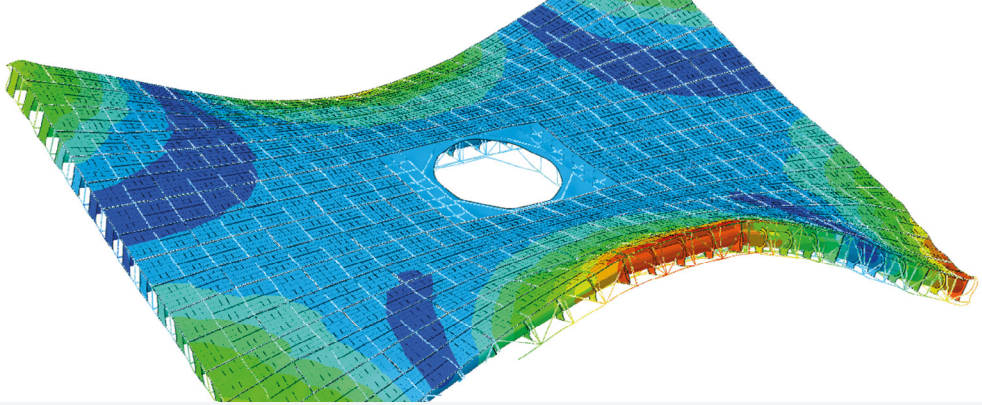
Numerical Modelling and Simulation

Quoceant have expertise in a range of modelling techniques and commercial software.

This includes: OrcaFlex, Abaqus, SolidWorks (COSMOS), Mathcad and MATLAB Simulink, and the development of bespoke computer models and simulations.

Our modelling capability:

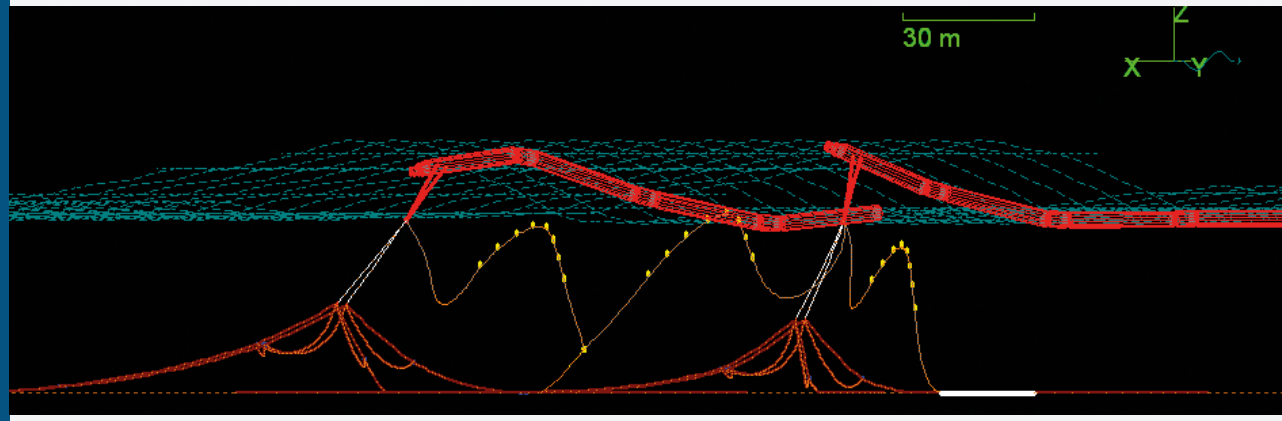
- Dynamic analysis of marine structures, moorings, subsea cabling, and marine operations
- Structural analysis including ultimate loading, accidental loading, fatigue life, wear, operational loading
- Operations and maintenance (O&M) system effectiveness modelling
- Lifecycle and Cost of Energy modelling
- Control Algorithm development



Analysis of Ocean Basin Wave Tank

Edinburgh Designs Limited

This project included structural analysis of a large wave tank basin with moveable floor. The project included advanced finite element modelling to capture the fluid-structure interaction using both Coupled Eulerian-Lagrangian and Smoothed Particle Hydrodynamic methods to examine the effect of wave action on the floor structure at shallow water depths.



OrcaFlex modelling

Various projects

Quoceant has carried out OrcaFlex analysis for a range of marine energy clients and technologies, modelling the interaction of mooring, power take-off and umbilical designs in operation and during temporary phases with vessel handling and dynamic subsystems.

Services

Power Take-Off and Control Systems

At Quoceant we have world-leading expertise in the control of marine energy systems and in power take-off design and development.

Our team has pioneered the development of hydraulic and electrical power take-off systems specialised for marine renewables, from design through to lab testing and at-sea operation.

Control is often fundamental to the successful operation of marine energy systems and should be considered an integral part of the design from the earliest stage. Quoceant can apply the theoretical background and have practical experience of implementation. We co-authored the control landscaping report for Wave Energy Scotland.

“Quoceant are a highly talented team with world leading expertise in wave energy power take-off systems and we are delighted to be working with them at MPS. By adopting proven principles and working with such an experienced team MPS is a significant step closer to successfully proving our novel wave energy converter at large scale.”

Graham Foster, Chairman & CTO, MPS

Quantor System:

Highly efficient power transmission for marine energy

Quantor was developed and demonstrated in partnership with Artemis Intelligent Power (now Danfoss). It marries Danfoss’s Digital Displacement® technology with a 4-quadrant quantised power transmission system previously applied in the Pelamis wave energy converter. This allows continuous control of very high loads and powers, without losing efficiency at part load. Quantor was supported by Wave Energy Scotland development funding. Read more at **www.quoceant.com/quantor**

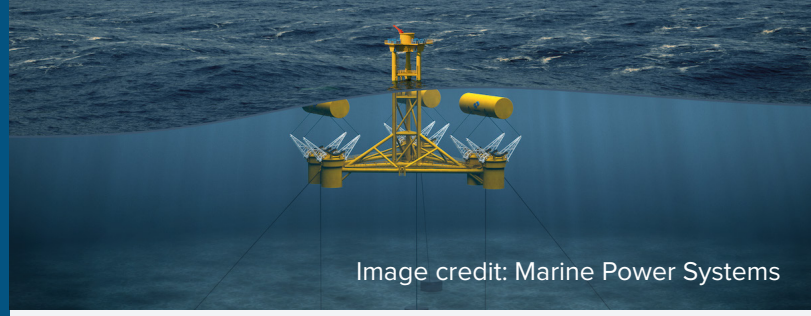


Image credit: Marine Power Systems

Power Take-Off Design and Integration

Marine Power Systems

Quoceant have supported Marine Power Systems in the preliminary and then detailed design of power take-off systems.

Power Take-Off Development

Artemis Intelligent Power (now Danfoss)

In partnership with AIP, Quoceant have developed the ‘Quantor’ system. Quantor is a novel hydraulic power take-off system using digital displacement ® hydraulics.

Services

Third Party Review and Due Diligence

Our review process will provide independent and expert commentary and advice. Quoceant can tailor a third-party review process to the client's needs and stage of development. This can range from a light touch experience-based workshop to a more thorough verification of full concepts or systems, extending to costing and wider economic reviews.

"Quoceant have an excellent knowledge of marine structures including expertise in the analysis and design of large fabrications. They have provided professional insight and diligence and I would highly recommend the engineering team."

Ed Maycock, Head of Foundations and Substructures at Ocean Winds

Third Party Structural Review

Moray East Offshore Wind Farm

Quoceant provided structural engineering support for the foundation design of the wind turbines and offshore substations. Quoceant also provided client-side expert engineering review services for the project developer.

About us

The Team

The Quoceant team are specialists in marine energy and innovation

From a background in the marine renewable sector, Quoceant was founded in 2015 by a small, close-knit team of multi-disciplinary engineers. Since then, the business has grown, and we have established a proven track record for producing rapid, effective, and safe solutions to a range of technology challenges. We solve problems through innovation and have the skill and experience to follow through from initial concept to fully detailed designs for systems of all sizes.

Image credit: Orbital Marine Power

Fluid Power System Review

Orbital Marine Power

Review of the fluid power system for the first-generation machine including recommended design modifications and review of proposed commissioning procedures.

Get in touch

To find out more or to speak to one of our experts please contact:

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