

Experts in Marine Energy and Technology Innovation

Quoceant offer full engineering design and consultancy services.

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

With a long background in the marine renewable sector, our team has a rare combination of hands-on experience, knowledge, and capability applicable to the wave, tidal, offshore wind, and wider maritime sectors. Quoceant go beyond the typical consultancy service with our fresh and informed approach to multi-stranded innovation.

Quoceant are a multidisciplinary team of engineers skilled at problem solving, innovation and technology development. 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

Mechanical and Structural Design and Analysis.

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

We carry out design and analysis in Abaqus and SolidWorks and are experienced in designing to offshore codes and standards.

"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 Oceanwinds (part of the Morary East Offshore Wind project team)

Our expertise includes:

- —— Mechanical and Structural Design and Analysis
- —— Power Take-Off and Control Design
- —— Mooring Systems and Marine Connection Systems
- ----- Offshore Operations Planning and Storyboarding
- —— Marine Electrical Engineering
- —— Concept Design Development and Evaluation

Innovation Offshore



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 and provided client-side expert engineering review services for the project developer.

Image credit: Orbital Marine Power

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.

Marine Operations Design and Analysis including Marine Connection Systems

The marine environment can be a hostile place.

It is therefore imperative that effective marine operations strategies are developed early in the project such that methods and equipment can be properly integrated into the complete design solution.

Quoceant have experience in storyboarding, analysing, and risk assessing a range of marine operations, including the modelling of a range of operations within OrcaFlex. Our expertise includes computer modelling of Operations and Maintenance (O&M) strategies to provide availability and operating cost benefit analysis. In addition, we have specialist understanding of marine connector systems and are the developers of the Q-Connect marine quick connection system. "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.



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.



Q-Connect: Enabling technology for marine connections The Q-Connect is an innovative Quick Connection System for marine applications. Designed by Quoceant, it provides a set of modular subsystems that 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

Marine Operations Concept Design

Tension Technology International

As part of the concept development stage of a novel marine energy project, Quoceant provided storyboarding, weather waiting estimation, availability analysis and costing of deployment and removal operations.

Numerical Modelling and Simulation

Quoceant have expertise in the use of a range of 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 modelling (O&M) system effectiveness modelling
- —— Lifecycle and Cost of Energy modelling
- —— Control Algorithm development



Analysis of Ocean Basin Wave Tank

Edinburgh Designs Limited Included structural analysis of the structure using finite element methods and fluid-structure interaction simulation 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. Consideration of wave-induced variable pressure loading for strength and deflection, assessment of natural vibrational mode shapes and behaviour during temporary operating states.



OrcaFlex modelling

Various

OrcaFlex analysis of marine energy devices for a range of clients including consideration of the mooring, power take-off and umbilical cabling interactions and for operational and temporary phases. Image shows Pelamis Wave Power simulation of two machines with electrical interconnection cable and moorings.

Power Take-Off Development and Control Systems

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

Our team also has in-depth knowledge and experience of hydraulic and electrical power take-off systems, particularly in their design, commissioning, and construction.

Control is an area of fundamental importance to any wave energy device, yet it is often overlooked or misunderstood by technology developers. At Quoceant we have world leading expertise in the field of control and 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 fluid transmission for marine energy

The Quantor system has been developed in partnership with Artemis Intelligent Power (now Danfoss) and provides a highly controllable, high-power, high-load and high-efficiency fluid power transmission system. Quantor marries Danfoss's Digital Displacement® technology with a state of the art 4-quadrant power transmission system previously developed for the Pelamis wave energy converter. Quantor was supported by Wave Energy Scotland development funding. Read more at www.quoceant.com/quantor

Image credit: Marine Power Systems

Power Take-Off Preliminary Design

Marine Power Systems

Quoceant have supported Marine Power Systems in the preliminary design of their power take-off for the DualSub and WaveSub concepts.



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.

Third Party Review and Due Diligence

Our review process will provide independent, experience based, expert commentary and advice. Quoceant can tailor a third-party review process to the clients 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 economic and costing reviews.

"Quoceant are a highly experienced and innovative team of engineers. The review work they undertook for Black Rock Tidal Power was both valuable and insightful."

Nils Hirsch, General Manager, Black Rock Tidal Power

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 and innovative projects. 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.

Third Party Technical Review

Black Rock Tidal Power

The scope included technical review of the platform, maintenance methods and systems, subsea connection, survey work and reported seabed conditions. An FMEA methodology was used to identify and highlight risks.

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

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