



CUSTOMER

A collaboration was formed between Fred Olsen, the University of Exeter, and financially supported by Innovate UK.

REQUIREMENT

To provide a critical friend review of the concept design for a Wave Energy Converter that supports the transition to green power. A Wave Energy Converter, has the potential to shift the balance from fossil fuels to using natural energy, thus reducing our carbon footprint.

BRIEF

Conduct a critical review of initial concept designs, provide detailed improvements and enhancements, and create manufacturing drawings for the Wave Energy Converter for production.

SOLUTION

The critical friend review, conducted by our highly skilled engineers, included an assessment of the mechanical design of the hull and structure, the bilge system, cooling system, PTO drive shafts, bearings and hubs, drive belts and pulleys, waterproof enclosures for electrical systems, as well as the integration of generators and electrical systems.

- **Optimised for Time and Cost Efficiency**

Component material changed from composite to steel. This was due to the long lead times and high initial set up costs associated with a moulded composite structure. We changed the design to have square edges rather than rounded. This allowed a simpler design with minimal impact on the structure. Innovative effort was focussed on those areas where it was likely to have the greatest impact.

- **Optimised for Performance**

Due to time constraints, focus was kept on the elements of the prototype system that were important to the concept being tested. The test rig was designed for

“We found the team of engineers to be creative and competent with a can-do spirit that was motivating to work with”

Even Hjetland
Project Engineer at Fred Olsen



SOLUTION (continued)

'back to back' testing (where one PTO mimics the sea movement) to test the control system on another.

- **Optimised for Practicality**

Using steel allowed the structure to be easily modified as the project progressed. The units were designed to be modular, allowing the BOLT to be dismantled and transported easily. Structural analysis was carried out to ensure the device would stand up to the given load cases. The knowledge and expertise of our engineers, underpinned by robust FMEA, reduced the risk otherwise presented by untested bespoke elements.

ACHIEVED

Designing and producing a Wave Energy Converter to convert wave energy into sustainable electricity. The solution resulted in a wave energy converter with reduced manufacturing, deployment, installation, and through-life costs.

