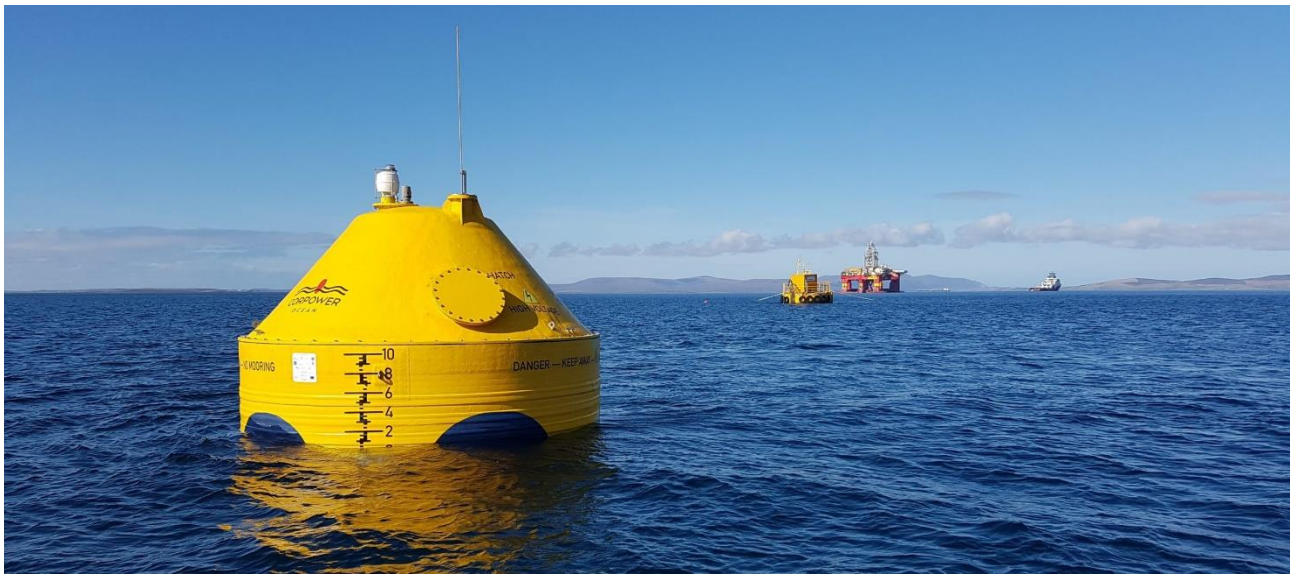
Success Story

A safe choice, TwinSAFE engineering with Pneutronic

CorPower Ocean AB is developing the latest generation of green energy generation in Sweden and Portugal. With the help of their floating power plants, renewable energy is generated from the wave motion of the sea. The kinetic energy is transformed into electricity from the up and down movement of the waves. This linear movement must be controlled by complex algorithms in order to be able to extract the maximum energy in every situation. Based on the risk analysis, this movement must be reliably monitored to ensure safe and reliable operation of the machinery.

This is precisely where Pneutronic, as a certified Beckhoff Solution Provider, was able to contribute the necessary expertise in the area of the EtherCAT-based TwinSAFE safety controller. Thanks to Pneutronic's intelligent solution, it is possible to travel at maximum speed during a longer distance of the overall stroke. As a result, the Wave Energy Converter can utilise its maximum potential.

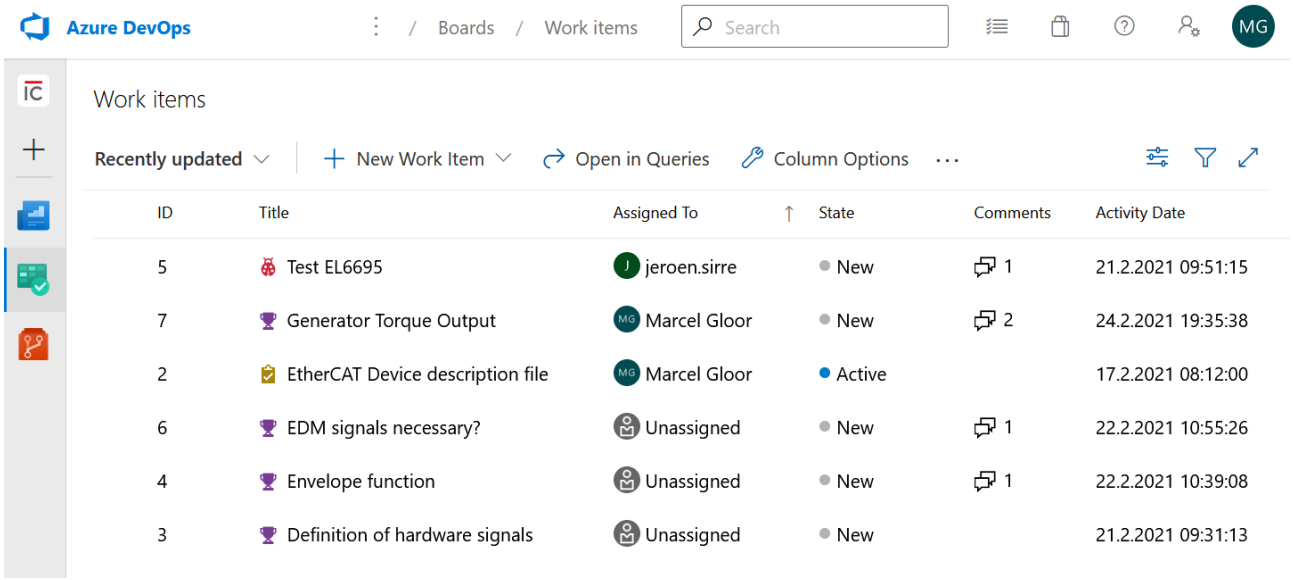


Approach

CorPower Ocean, as the developer and manufacturer of the tidal power plants, recognised from their risk analysis that the linear movement must be safely monitored and controlled. As EtherCAT is already used as a fast fieldbus within Wave Energy Converter, the use of Fail-Safe over EtherCAT (FSoE) seemed obvious. The development of safety controllers based on TwinSAFE requires a lot of specific expertise and long-term experience, which CorPower Ocean does not yet have.

Together with Pneutronic, joint development was therefore started seamlessly after the risk analysis. Because Pneutronic has been working with state-of-the-art tools for a long time, the distance to the customer was insignificant. For the planning of the work, both companies relied on DevOps, where all work packages, bug fixes and

feature requests were managed together. The source code management is completely based on GIT, which means that all adjustments are transparent and centrally documented for the customer.



Technology

FSoE-capable encoders were used for monitoring the linear movement, which transmit standard and safe signals together via a single EtherCAT cable. The calculation of the speed is conducted directly in the encoder, which means that jitter during transmission is irrelevant. This is the best way to generate a signal with maximum resolution. To take the harsh environment into account, the IP67-certified TwinSAFE controller EP1957 was used. Several safe envelopes are generated and monitored within the safety controller.

Conclusion

The engineers at Pneutronic were able to quickly familiarise themselves with the subject matter due to their many years of experience in various industries. Within a very short time, they were able to start engineering without ever having seen the Wave Energy Converter.

As Pneutronic realises all its projects in an agile environment, Covid's travel and other restrictions were no obstacle to the collaboration.

"Thanks to the expertise of the Pneutronic team we could quickly implement a simple and elegant solution to ensure safe operations"

Jonathan Meason CEng MIMechE, Engineering Manager CorPower Ocean

We are happy to take on your requests as well. Challenge us!

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