CASE STUDY

Bespoke Hardware Design - Pulse to Pneumatic Project

CUSTOMER OVERVIEW

EDF is Britain's biggest generator of zero-carbon energy, running a fleet of low carbon nuclear power stations. Being part of the critical national infrastructure and the UK Energy security strategy, EDF has to ensure that the right contractors are engaged on site to support the life-extension of their current fleet by delivering high quality evaluations, assessments and product development.

We have worked with EDF since 2007 and are proud to provide critical support to industry leaders with their legacy systems and components. This particular project involved bespoke hardware development for Torness Power Station. Our extensive knowledge of legacy electronics and ageing equipment meant we were ideally placed to take on this project.

Torness Power Station approached us as they were experiencing some issues on installation of their new Pulse to Pneumatic converters. They had decided to replace their existing converters, from pneumatic/mechanical originals to a much smaller electronic alternative.

During the installation of new Pulse to Pneumatic (P2P) converters, *which are electronic equivalents of the Babcock Bristol YSL P2P units*, they started to experience problems during commissioning with pulse degradation from the BBL Series 4 control cards, which were involved in the pulse generation to allow pneumatic positioning of Air Operated Valves (AOV's). This issue seemed to affect predominantly long-length loops on site and went previously unnoticed on shorter-length loops.

Like Technologies, due to their experience with the BBL Series 4 control system, were asked to assist and were given the following remit;

1. Investigate why the degradation in the control pulses was prevalent on long-length C&I loops.
2. To produce a solution, universal for all loop lengths, compatible in both manual and auto mode of operation, that would correct the control pulse quality and return correct control pulses on-site to the new P2P units.

Challenges

- Determining what was causing the degradation in the control pulses on long-length loops.
- Ensuring the P2P Interface accurately converted pulses from the Series 4 module, and was compatible with the new P2P converter.
- Manufacturing a product that was small and compact enough to fit inside the existing cabinet.

Our skilled engineers began their investigation into what was causing the issue. Their time was spent analysing the drive circuits and where previous modifications hadn't worked. This included both desktop schematic analysis and testing the physical products in our workshop.

Decision-making process

Once we had the solution in mind, we conducted a site visit to take measurements and make sure that it was suitable and fit for purpose. We generated reports detailing our findings and a final design concept, which was issued to the customer for approval.

Once approved our design went into product development which included factory acceptance testing and quality control checks to ensure the new modules performed as intended.

Solution

The solution, known as the **Pulse to Pneumatic Interface**, is two-fold;

1. An interface unit fitted at the BBL Series 4 panel control card output connections to isolate the control from the cable capacitance.
2. An interface unit fitted at the new P2P units to replace what was a diode/resistor network.

Both these units also afford some additional voltage spike suppression on the circuit to protect the interface electronics.

Following a successful trial on site, they have been fitted and tested, with all loops now operational across one of the reactors on site. The final reactor will be completed during the next outage.

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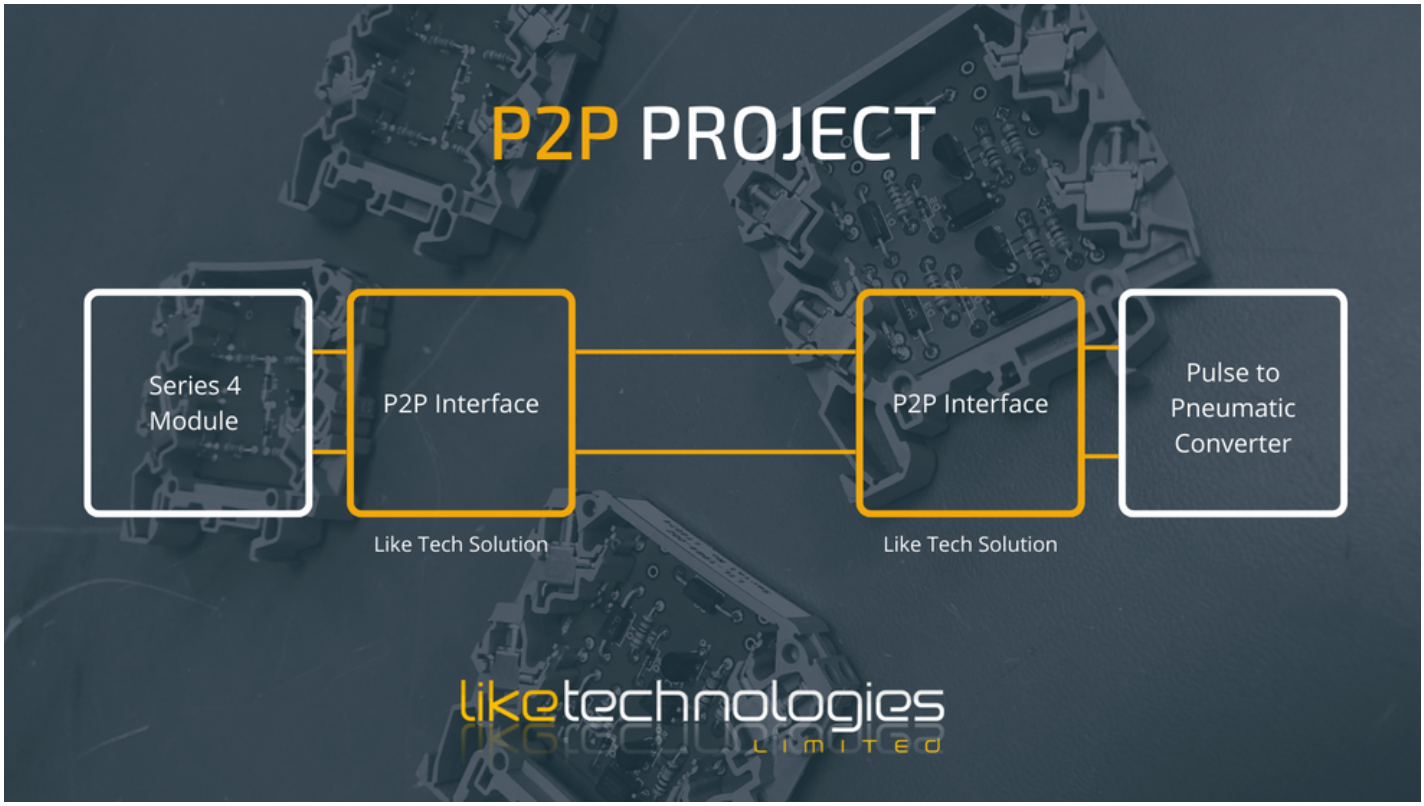
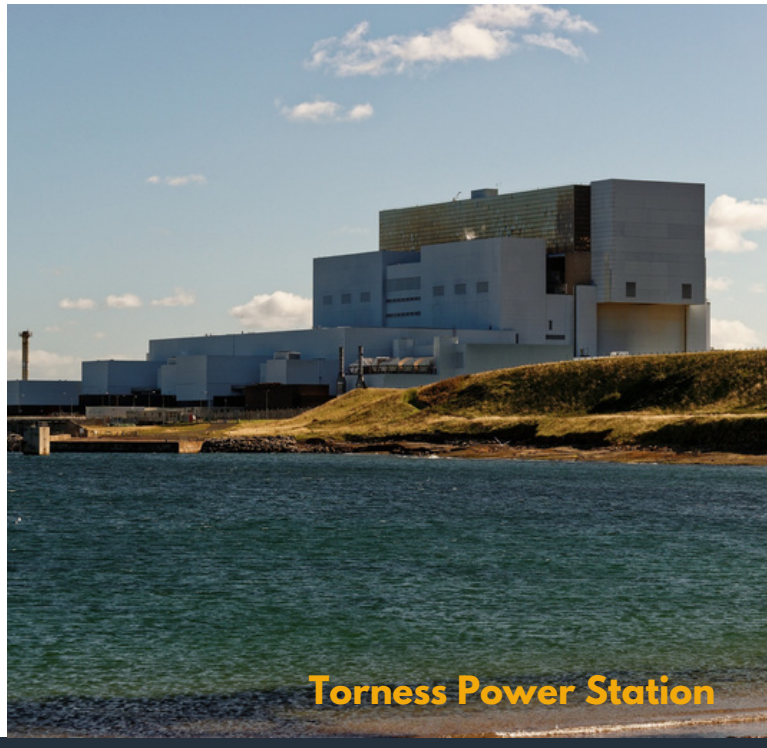


"Like Technologies produced various reports at appropriate stages in the project to allow EDF to track and understand the progress being made, and met regularly with EDF to discuss outcomes.

Drawings for the new interface modules were produced and provided to EDF as well as QA plans to manufacture and test prior to shipping to site. The units were allocated a site catalogue ID to secure QA with future purchases.

EDF were very pleased with the way Like Technologies handled the project and communicated well at each stage. The final solution is well-designed and is a practical retrofit to our control loops which correct the pulse degradation problem."

John McKenzie- EDF



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