

Cefn Dryskoed WTW

SCADA and Telemetry Works



As framework-approved systems integration suppliers, OSS successfully tendered the contract to migrate the existing SATT control system to a newer modern PLC/SCADA solution using Mitsubishi Q series PLCs and a Servelec SCADA and telemetry system.

Cefn Dryskoed WTW is a water treatment facility near Neath in South Wales located in an area of outstanding natural beauty. Nestled in the Brecon Beacons National Park it serves 17,400 properties.

The Project

This was a notifiable project and an F10 was raised with the HSE. OSS were nominated as Principal Contractors and subcontracted the services to their installation arm OSS Electrical to undertake the supply of the electrical design and installation subcontract. OSS provided project management working to an NEC3 contract with the client, DCWW. As part of the CDM duties, we prepared and issued a Construction Phase Plan outlining the Health & Safety arrangements for the project and management of sub-contractors.



to cover the site aspects of the project including installation and commissioning activities. It was then used as the basis for the HAZOP and HAZCOM reviews and was reviewed and updated each week during commissioning.

The control system was successfully migrated through a series of time constrained controlled plant shutdowns to integrate the system in a staggered manner. Each step allowed for a fall-back step should any issues be encountered. The main control system was migrated over the course of three months with little or no significant disruption to works operations.

The control system was then Site Acceptance Tested (SAT) with the client before a full handover process was undertaken with their Automation, Telemetry and Control team. This included a handover of As-Built documentation and system software and device configuration backups.

Challenges

Site shutdown periods were insufficient to achieve a full changeover in one day, therefore, splitting the changeover into more manageable stages overcame that issue. The need for multiple shutdowns were limited to two per week, each shutdown was dependent upon certain conditions beyond our control being met. Alternative work on-site was planned ahead in case of aborted planned shutdowns and this helped keep costs down for the customer.

The project was executed to the highest specifications within OSS's Integrated Management System - accredited to:

- ISO 9001 for Quality Assurance,
- TickIT Plus for Software Quality Assurance,
- ISO 27001 for Information Security and
- ISO 45001 for leadership in Health, Safety & Wellbeing.

Functional Design

Using the requirements set out by the client, OSS developed a Functional Design Specification (FDS) to detail the operation of the proposed control system. Once this was agreed and approved by the client, the software development of the PLC and SCADA was undertaken along with the electrical design and manufacture of ICA backplates and fibre optic network.

The software was developed off-site at OSS's office and the client attended a full integrated Factory Acceptance Test (FAT) using a simulation system to fully test the system before release to site.

A detailed commissioning plan was prepared

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Key Tasks

Our teams carried out the following:

- Migration of existing control system including SCADA and PLC to a new Mitsubishi Q series solution (6 PLC nodes) of which four nodes are redundant controllers;
- Full CDM project with OSS as Principal Contractors;
- Bespoke software;
- Automation of clean water treatment process including hydroelectric turbine;
- Electrical installation of control panels and retrofitting of ICA backplanes and PLC hardware;
- Installation of plant wide fibre optic ring topology network;
- Full project lifecycle including survey, design (FDS, schedules, drawings etc), software development, internal and customer Factory Acceptance Testing (FAT), site installation and commissioning, Site Acceptance Testing (SAT), Training, Provision of O&Ms and formal handover.

Our Approach

Using the project lifecycle, proper planning and a 'keep it simple' approach we delivered the project without having to overstretch ourselves, which can inevitably create an issue. By scheduling-in the work shutdowns and planning-in the key personnel for the tasks to be completed that day, all tasks were achieved to satisfaction.

The reality of the site work is it can get a little manic with unforeseen issues arising. At this project, these issues were dealt with calmly and logically reasoned out with the support of other OSS engineers, albeit remotely located, who were willing to step in to help or answer queries from the customer on how to work around their plant issue.

In-House Skills & Capabilities

Our OSS engineers are trained, certified and experienced with Mitsubishi PLC products. They are also trained and experienced on the client's preferred SCADA. Each of our engineers have specialist skill sets and capabilities, that can be called upon to add value for setting up fibre optic ring topology devices, troubleshooting and remote support. Our experienced team members can help each other out in the most effective way - as

the adage goes "a problem shared is a problem halved" and in the majority of cases, solved.

Specialist Assistance

Our certified fibre optics installation technicians have the capability to perform cold splicing to terminate a fibre. It is a far more efficient and better option to make use of the more advanced fusion splicer to terminate a fibre.

Problem Solving

The Mitsubishi programming interface had moved onto the newer GXWorks 2 platform. The difference in behaviour of the online changes to that of its predecessor GX IEC 7.04 gave our engineers some initial problems.

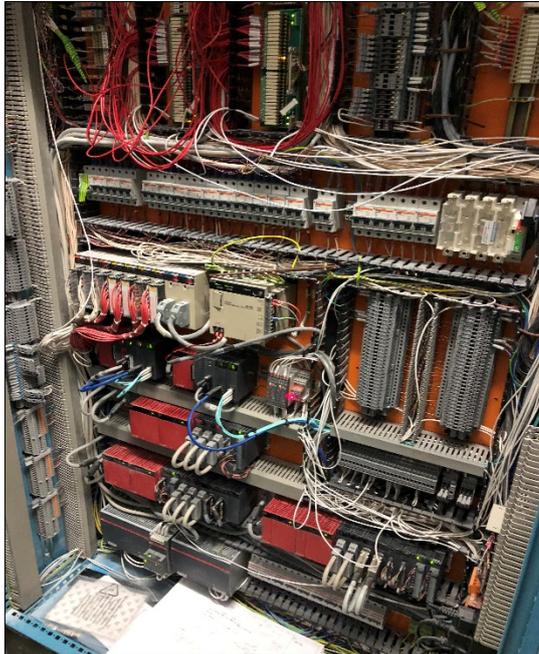
Online changes are necessary in a continuous process industry as shutdowns require planning-in and are usually arranged days or weeks in advance. As online programme changes became near impossible to implement, alternative arrangements had to be made in the form of planned brief plant shutdowns of very short durations of under an hour, to perform modifications to allow changeovers to continue smoothly.

A technical support call was raised with Mitsubishi and after a great deal of technical discussions our method of managing the risk to process was deemed the best way to proceed.

Adding Value

The changeovers were time constrained due to the uncontrolled demand placed on the outlying water networks by end users. As a single source of supply the works can only be off for a definitive period of time before production must be restarted to maintain the levels within outlying reservoirs.

The impact of the reservoirs being too low can have a knock-on effect with the next planned shutdown, so it is also in the interests of OSS to achieve the tasks in the allotted times.



Key Skills

Our engineers brought the experience and skills in the following areas to the benefit of the project:

- Mitsubishi PLC control systems
- SCADA
- Process control including PID Loop tuning
- Batch sequencing
- ICA Electrical Installation and fault finding.

How Did We Stand Out?

Our OSS engineers are a dedicated bunch to the point they offer 24-hour support during the changeover period including weekends. This is above and beyond their normal daytime role and it is very much appreciated by our clients as it gives them the confidence to continue forward with the changeover process. It also helps build upon our reputation for providing a fantastic service.

By managing the changeovers and not biting off more than the engineers could chew, works operations were able to accommodate the shutdowns without any noticeable disruption to customer supply and avoided the need for additional water tanker costs. OSS engineers remained on-site, beyond their normal hours of work, to ensure operations were confident in the processes functionality before retiring for the day.

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