

Pen y Bont MCC

DCS Upgrade

Pen y Bont WTW is a sewage treatment plant next to Candlestone Castle and is located in Bridgend County borough, Wales, United Kingdom.

At this project, our teams carried out the following works:



- Management, organisation, administration, and supervision in connection with the delivery of the programme;
- Full CDM project with OSS as Principal Contractors;
- DCS upgrade of wastewater treatment works at Pen y Bont; The design of upgraded network and ICA panels throughout the site included:
 - Panel build of main PLC cabinet, server cabinet and two smaller ICA panels.
 - Site modification of ten ICA panels with new Mitsubishi PLCs and network equipment.
 - Installation of new UPS in ICA panels where space was available, on other panels UPS were installed external and cabled back to ICA.
 - Installed fibre optic network cabling around the site and fusion spliced into patch boxes.
 - Installed three-way terminals into existing cabinets in readiness for changeover.
- Carried out test and inspection of all panels and cabling. Installed server cabinet and network cabling in main control room. When system was fully tested changeover was carried out with the software engineers.
- Commissioning of control system changeover.

Pre-Construction Stage: Our aim at this site was to improve health and safety in the industry by sensibly planning the work so the risks involved were managed from start to finish. Having the right people for the right job at the right time, and to cooperate and coordinate our work with others.

The network design required qualified Profibus/fibre optic engineers. Engineering of the panels was carried out by qualified and trained personnel. Cable installation was carried out by competent and qualified installers. All site work was planned to ensure that all personnel were safe and that works operation was not compromised. As this is a live plant all personnel were instructed in safety aspects including deep water, contaminated water and operational plant.

A detailed commissioning plan was prepared to cover the site aspects of the project including

installation and commissioning activities. It included details of client access and training, O&M manuals, recording drawings, software and test certifications, pre-commissioning tests, setting to work, commissioning checks and performance testing. It was then used as the basis for the HAZOP and HAZCOM reviews and was reviewed and updated each week during commissioning.

Live Operational Site: We effectively and openly managed interfaces with the client and also another contractor, Mott McDonald Bentley (MMB). There was careful coordination between our scheme and theirs that included managing overlaps where their contractors were making changes to areas of our control (including panels and software). At Pen y Bont, our team of engineers also worked closely with the customer's in-house capital department to deliver the DCS upgrade.

Pen y Bont
Case Study

Pen y Bont MCC

DCS Upgrade

Being a live works, plant operations had to be maintained, so our panel installation works were required to be carried out with the plant still running. To enable the changeover, three-way terminals were installed during staggered short duration shutdowns and these were switched over during the changeover.

In addition, with another contractor carrying out major civil works on site, to ensure safety and prevent programme we maintained close communication with them and collaboratively planned our work accordingly. We also held daily briefings with both teams to communicate areas of work and safety considerations. Our team also maintained communication with approved suppliers to ensure materials were available when required on site to prevent any delays to the programme.



All aspects of the detailed design and installation were carried out in compliance with the most recent revisions of DCWW Standard Specifications and Drawings, Water Industry Mechanical Electrical Specifications (WIMES); Civil Engineering Specification for the Water Industry (CESWI); and appropriate current British/EN Standards.

Multiple Work Disciplines: As plant operations had to be maintained, our panel installation works were required to be carried out with the plant still running and with other contractors on site. As a matter of general approach in situations like this, OSS project and site management personnel always operate with the broad principles of collaborative practice from the outset. We are experienced at working on projects at live client sites by planning at each stage of our work, the potential impact on the process and equipment and taking sufficient steps to ensure that this is mitigated to acceptable risk levels. We effectively and openly managed interfaces with the client and other contractors. We worked with the

principal designer to plan, manage and coordinate the planning and design work, as early as possible.

We did this by ensuring that health, safety & wellbeing was managed to the highest standard through the processes inherent in our ISO 9001, ISO 14001 and ISO 45001-certified integrated management system (IMS) and that our operations aligned with Health & Safety Executive guidance HSG65 - Plan, Do, Check & Act. We provided leadership through all aspects of the work and through our collaborative work with others. We undertook process risk assessments (PRAs), embedded within our project cycle, supported by our IMS as evidenced by our quality documents

case study

such as the Construction Phase Plan (CPP), the Risk Assessment system (RAs) and Method Statement templates (MS).

CDM Regulations 2015: This was a notifiable project and an F10 was raised with the HSE. OSS were nominated as Principal Contractors to undertake the supply of the electrical design and installation subcontract. We provided project management working to an NEC3 contract with the client. As part of our CDM duties, we prepared and issued a Construction Phase Plan outlining the Health & Safety arrangements for the project and management of sub-contractors. Minor temporary works were carried out at this scheme.

Our experienced and skilled team members operate safely at all times and their H&S qualifications include: NEBSOH, SMSTS, SSSTS, TUV Professional, OHSAS 18001 Internal Auditor, IOSH Managing Safely, First Aid at Work, Water Hygiene and Safety Passports. The project was executed to the highest specifications within OSS's Integrated Management System (and our specialised iSite App) - certified to:

- ISO 45001 for leadership in Health, Safety & Wellbeing,
- ISO 9001 for Quality Assurance,
- ISO 14001 for the Environment,
- TickIT Plus for Software Quality Assurance, and
- ISO 27001 for Information Security.

All RAMS followed OSS's IMS review process to ensure risk assessments and associated controlled measures were scrutinised, challenged and approved before being issued to the client for approval two weeks before commencing work.

Weekly site inspections were undertaken to ensure the work areas were safe and any hazards factored into risk assessments ensure appropriate control measures and safe systems of work were utilised. Daily toolbox talks were provided to make site personnel aware of activities planned for the day and associated safe systems of work to be followed.

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Key projects case

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Internal/External Stakeholders: We maintained close communication with the client throughout the project. Regular design reviews ensured that the project was able to progress efficiently and daily site briefings, maintained plant operation and safety of personnel. Close communication with the other contractors on site ensured that both projects were able to proceed safely and efficiently.

In addition, our teams co-operated with DCWW Operations and regulatory authorities requiring safe access to areas under our control. Co-ordination of the works were carried out through the DCWW Project Co-ordinator /Project Manager and unobstructed access was provided to DCWW operational staff at all times during the works.

How Did We Stand Out? Our engineering has a strong presence in the water industry, from delivering innovative solutions on large capital investment projects to small modifications on existing systems. Our process and panel knowledge has been of enormous benefit to our end users. At Pen y Bont, we were able to add value and provide their experience with Servelec (Ovarro) SCADA systems and fibre optics and by using a hot and cold splicing technique for terminating fibres within fibre patch boxes. We also carried out quality testing using calibrated test equipment to ensure specifications for signal loss are within acceptable limits.



Customer Services Challenges: We recognised that our teams had the responsibility to act on behalf of and represent DCWW to its general public customers. It was vital that we identified measures to ensure that customers were considered prior to mobilising. These included proper planning to mitigate issues to reduce adverse impact to customers whilst on site, through assessment & quantification and understanding of local sensitivities or sites with historic operational issues. Through this approach of close collaboration with our client from the outset, we did not experience any customer services challenges.

We build CE marked control panels to specific customer requirements, to comply with all legal requirements and to conform to relevant industry standards, including BS EN 61439.

During the site installation works, the bridge at the only entrance to the works was undergoing maintenance, so we had to plan works access and deliveries around the times when the bridge would be closed.

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