FUTURE-PROOFING CONTROL AT DRAX POWER STATION

Suzanne Gill reports on the Drax Power Station decarbonisation journey, focussing in particular on the need for a new supervisory control and data acquisition (SCADA) solution that would help ensure a more integrated control solution and ensure the operation is future-proofed.

UK-based Drax Power Station has been transformed in recent years in what is believed to be the largest decarbonisation project in Europe. Today the power station – which has seen a great many changes since its construction in the 1960s – provides the most renewable power of any single location in the UK – 14 terawatt-hours. Of the original six boiler units at the site, four have been converted to biomass and early in 2021 the plant ceased running its two remaining coal units commercially.

Obviously, the transformation of the power station required many control system changes. Added to this there has also been an increasing need in recent years for the power industry to meet more stringent legislative demands. To help Drax meet these challenges the organisation made a decision, back in 2017, to upgrade the entire control system to ensure that wider integration of the plant's control system with other systems and projects would be possible to make sure that the operation was future-proofed.

According to Martin Nichols, control & instrumentation engineering team manager at Drax Power Station, one of the big drivers for change in the control room was the age and increasing obsolescence of the original RTAP SCADA system. He said: "We were running the power station on a system that had been fitted in the early 1990s and it had started to show its age. While the SCADA system had been running the plant successfully for many years and the engineering team had established routines and procedures for

maintaining, building, and deploying projects using the system, we were finding it increasingly more difficult to get support, making it harder to undertake the project work necessary to allow for a smooth transition from coal power to bioenergy.

Greater flexibility

"Because our operators were so familiar with the original SCADA system, we wanted to minimise the need for retraining on any new system. However, it was also important to find a system that would give us greater flexibility. I also stipulated that the chosen system must have no bespoke coding or logic – it needed to be a native out-of-the-box solution," continued Nichols.

Because the engineering team were comfortable with the existing processes and procedures in place at Drax, Nichols ideally wanted a solution that would require minimal changes. "I wanted to be able to employ the same paperwork

standards, but with a more up to date system, in a bid to minimise the need for retraining of the engineering team," he said.

Chris Cox, technical & business development manager at Codra, takes up the story: "Thanks to our longstanding experience in the nuclear sector, which is what the Panorama suite was developed for, a feature embedded into the Panorama E2 system enables us to programmatically transfer data from the original system and build it directly into the Panorama application. This feature, which was borne out of the need for the nuclear sector to ensure that a certificate to operate remains valid following any systems upgrade, offers benefits in other sectors too and this helped us to meet Drax's new SCADA system requirements.

"We wanted to demonstrate the benefits of this technique to Drax, so we convinced the engineering team to provide us with a sample of data to test."

This was a success and Codra was given more data to further test the validity of the automatic transfer of legacy system data into Panorama for the Drax application.

"This led to us eventually being invited to transfer the complete legacy SCADA system configuration into Panorama during a scheduled shutdown of the plant so that the systems could be run alongside each other. Yes, a few minor errors were identified when we did this, but in essence it was a straightforward automatic transfer," continued Cox.

Panorama was able to read the same equipment alongside the original system, but was providing more detail, and was faster than the legacy SCADA solution. "We were also able to prove that it would not be necessary to redraw all the graphics – which offered some huge project time savings," he said.

It was largely down to the success of this onsite test that finally led to the decision by Drax to specify Panorama SCADA software right across the power station.

Thanks to its nuclear industry roots, Codra's Panorama suite of products also has established expertise in security. Indeed, Panorama E2 was the first SCADA platform to be awarded the First Level Security Certification (CSPN) by the French National Cybersecurity Agency (ANSSI) and this gave Drax the confidence that the solution offered a proven level of security.

The systems integrator for the project, Morson Projects, was then tasked with installing the system into each unit during scheduled shutdowns. The interface to connect the SCADA system to plant devices and PLCs is via OPC-DA which allows the SCADA solution to connect directly and easily to legacy systems.

"The Panorama platform is object oriented to the core," explained Cox. "This means that when you put an application function and feature together it can be tested as a single entity and its behaviour can be assured before the function is scaled across an application. This helps reduce errors that would otherwise need to be corrected later in the process – and so it can offer time and cost savings and reduce project delivery risks."

Conclusion

Ultimately Codra, and its Panorama SCADA solution, was specified thanks to its flexibility and its ability to fit in with existing Drax standards – the screens and operator experience are almost identical to that of the original system, which helped enable the engineering team to quicky get up to speed and work confidently with the new system. Today, Panorama controls all four bioenergy units in addition to common services and a water treatment plant on the site, from a single control room.

"The Drax application has high levels of complexity and involvement. However, the features of Panorama meant that all we needed to do was create a toolbox and class library in the application and then we were able to hit the ground

running," said Nichols.

"Because of the way the system is designed, we have a common cross-class library across all of the systems. This is a big benefit as it makes it easier to manage and operators quickly became familiar with it. We no longer need to rely on the ever-decreasing number of systems integrators and suppliers who were needed to help us with any new projects based around the original RTAP SCADA. However, the main benefit is that we now have an open and flexible SCADA solution that can be easily interfaced into other systems, and that we will be able to extend in the future if needed," concluded Nichols. ✚