

Oilfield and Gas Storage Facility

The client, a wholly owned subsidiary of Petronas, operates an Oilfield and Gas Storage Facility. The gas storage facility has to respond to the business requirements of commodity trading and thus has to be in a state of readiness at all times to either import gas from the national grid or export from the store to the grid. The company recently upgraded its control and monitoring systems to ensure reliability and availability, the work was undertaken by Cougar Automation, based locally at Waterlooville, using the latest version of Wonderware InTouch provided by SolutionsPT.



The client is situated in the Weald Basin which is a major geological feature of southern England and northern France. Their operations are disposed across the region with an oil production and gathering plant at Weston Common, satellite well sites, interconnecting pipelines for the transfer of gas, oil and water, an oil pipeline to a rail terminal at Holybourne and a gas pipeline to Barton Stacey for gas import and export. The client's 10 billion cubic feet underground gas storage facility was built as an extension to an existing on-shore oil production plant. The store operates by taking natural gas from the National Grid Gas Transmission System through a 27 km long, 24-inch diameter pipeline to the client's oilfield. The gas is then pumped for storage into depleted oil reservoirs.

The original oil production and gathering plant at the client's site has been in operation for over 25 years, whilst the gas storage facility commenced operations in 2005. Gas storage operations at the client's site take gas from the grid when demand is low and resupply to the grid when the market demand is greater. The storage also provides valuable additional capacity to the system. The gas is compressed into the underground reservoirs from which oil has been extracted, the reservoir occurring naturally and being surrounded by impervious strata. When the gas is required it is drawn from the reservoir, conditioned in various stages to remove H₂S, heavier hydrocarbons, water and particulates and then recompressed to feed into the national grid.

Accruing problems

The original 2005 control and monitoring scheme were designed using Wonderware InTouch and Rockwell PLC's with Pilz SIL3 equipment. Over the intervening years as the system was developed it increasingly became unresponsive, mainly owing to network loading and non-optimised architecture. Support was proving difficult and on one occasion a problem requiring urgent attention was brought to the attention of Cougar Automation who arrived on site within 2 hours and remedied a solution. This local support was noted and when the new control room was being planned Cougar Automation were requested to undertake a complete system review and recommend improvements.

The main problem with the architecture was it had been extended and the data volume was overwhelming the control network infrastructure. The SCADA system was removed from the control network and a separate Ethernet system installed by adding Ethernet cards to the Rockwell controllers and used for SCADA purposes. This restored system responsiveness, but other work was needed to

ensure reliable operation and to make the system more supportable. The need for availability and robustness was paramount and it was known that the existing system was not wholly reliable in switching from master to slave.

The Wonderware InTouch SCADA in use was Version 9 running on Windows XP, which required Solutions PT provided DRAX (Dual Redundant Active X) to provide redundancy in this critical system by automating the changeover of tag servers. Although this had proven to be successful it was an extra aspect that needed support. Upgrading to the latest InTouch version would mean that DRAX was no longer needed as redundant operation is standard in InTouch and is enabled by a single mouse click. Transfers from master to slave are now not seen by operators as they are seamless and require little maintenance, any work that is needed can be undertaken without causing downtime. Kevin Baker, Project Manager, Cougar Automation, said, "The built-in redundancy function in the latest version of InTouch allowed us to readily configure resilience into the application".



Upgraded to higher performance

The update of InTouch was an automatic process with a report being generated about areas that needed manual intervention. This was minimal and Cougar Automation made some refinements to the SCADA displays for better clarity and aesthetic appeal. At the same time the operating system was upgraded to Windows 7. system more supportable. The need for availability and robustness was paramount and it was known that the existing system was not wholly reliable in switching from master to slave.

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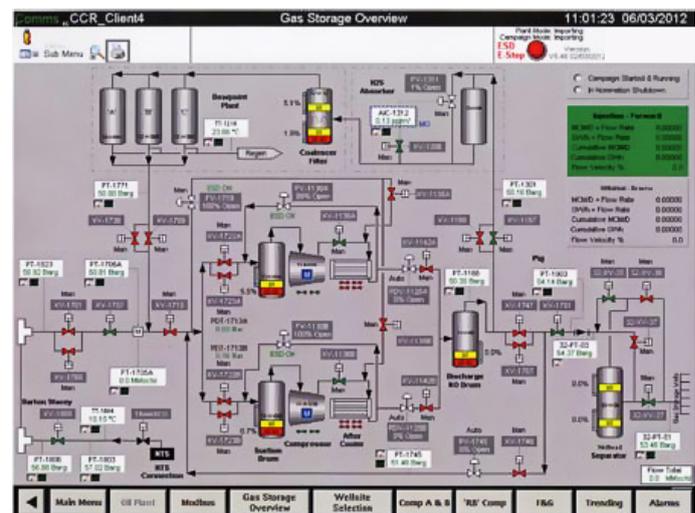
System Integrity

The integrity of the site control system had to be validated, following the upgrade Cougar Automation produced a 'cause and effect' testing system. This confirms by testing that particular conditions in the plant have the desired resulting effect, and no unwanted effects. The site has comprehensive Emergency Shutdown procedures which are executed from the control room using dedicated hardwired systems.

The client is a Top Tier COMAH site (Control of Major Accident Hazards) and works under those regulations. This ensures safe working and sensitivity to the environment. System security is an important aspect to such a strategic facility, the complete control system running in isolation from other IT systems.

Clients C&I Engineer "Cougar Automation has provided us with a system that is much more resilient and responsive". The Clients C&I Engineer added that Wonderware InTouch was their preferred system as it provided full insight into

their facility and a clear overview display of the facility and detailed alarms and reports. Summarising, Clients C&I Engineer Said, "The system has provided peace of mind at many levels, most importantly being that it is well supported". Cougar Automation has, when required, secure remote access to the system to assist in rapid problem diagnosis, a 24x7 support contract is in place and the duty operator confirmed that "there is always someone at Cougar Automation at the end of the phone. Their local proximity to us allows Cougar Automation to provide a high level service response to ensure that operations at the plant can always respond to the requirements of the fluctuating gas market."



Summary

The comprehensive system upgrade that was implemented by Cougar Automation has delivered the results which the client was seeking. Much of the existing control scheme was retained; the system responsiveness was vastly improved by adding a separate Ethernet network for the SCADA system. The upgrade of InTouch to the latest version made many new features available which were used to add resilience to this critical system, and to provide simpler configuration. System functionality was revalidated with the Cougar Automation designed 'cause and effect' testing and enjoys on-going support 24x7 through an effective support infrastructure provided directly by Cougar Automation and backed up by SolutionsPT. Cougar Automation is a SolutionsPT Premier Partner.