Automation IT

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Automation IT awarded contract to upgrade SCADA system for Unitywater Sewage Pump Stations

Unitywater began operations in July 2010 and were established as part of the Queensland Government's water reform program. They distribute and retail water supplied from the South East Queensland Water Grid. Unitywater operates and maintains more than $2.9 billion of essential service infrastructure, supplying water and sewerage services to residential and business customers throughout the Moreton Bay, Noosa and Sunshine Coast regions.

Example of one of Unitywater's Sewage Pump Stations

THE CHALLENGE

Automation IT was contracted to upgrade a large quantity of Sewage Pump Stations (SPS) throughout the Moreton Bay & Sunshine Coast regions with the aim of providing similar layout & controls across all sites, in line with the current specifications & requirements of Unitywater. This work was a part of Unitywater's SCADA Upgrade Program. Upgrading 245 Sewage Pump Stations and working to a tight deadline of such a large scale project presented a number of challenges. As the Sewage Pump Stations were already in operation the main challenge was to carry out the upgrade and commissioning works whilst still maintaining the functionality and operation required at each site.

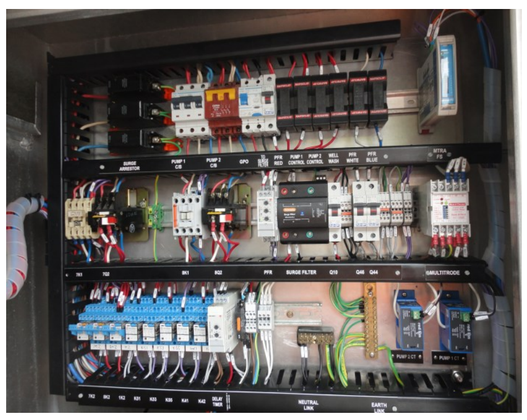
The project involved:

- Supply & installation of hardware at each site as determined by the existing state of the individual SPS
- Configuration of the Radio Telemetry Units (RTU)
- Network Configuration for each individual SPS
- Testing & Commissioning of all SPS
- Development of drawings & documentation relevant to each individual site

SPS - Pump Control Instrument Panel

SEQUENCE OF WORKS

After the RTU and SCADA templates were received from Unitywater, configuration and bench testing of RTU's for specific sites commenced. Engineering of individual sites continued through the life of the project as commissioning teams moved from one site to the next. Crews carried out individual site inspections to finalise electrical install requirements as well as to feedback details to the engineering team for the development of site specific drawings, commissioning plans and test sheets. The upgrade methodology used on each SPS was to perform it in two separate stages. The first stage was for the electrical crews to carry out all possible electrical works while maintaining the existing operation of the SPS. Testing was also carried out by the engineering team at this stage, to establish communications from RTU to Repeater at each site. Site antennas were adjusted as required to give the best possible signal. Stage 2 was site testing and commissioning which was performed by both an engineer and an electrician so as to rectify any issues during testing. Tests included point to point wiring checks, functionality tests as well as confirmation of SCADA status and control. Once a site's functionality was confirmed, the updated electrical drawings were revised by the engineering team for inclusion into the site drawing package. As the drawing packages were completed, these along with the site test documentation were issued to Unitywater as a completed site document set.



SPS - Pump Control Section

SPS - SCADApack RTU Section

SCADA SYSTEM

The SCADA system utilises Schneider ClearSCADA for both HMI visualisation and initiating or acting upon communications to and from each site using the in-built DNP master driver. The SCADA is designed to provide a highly functional SCADA system utilising the limited network bandwidth available from a radio system. The Standard Sewer Pump Station template developed for ClearSCADA also included the SCADAPack RTU configuration. ClearSCADA therefore became the storage master for all RTU configurations. The SCADAPack RTU configuration file could be downloaded directly from ClearSCADA into the SCADAPack on an as-required basis. The Standard Sewage Pump Station sites are controlled using a SCADAPack 357E RTU. This RTU along with additional add on modules (where required) is responsible for all on-site control and peer to peer communications. The RTU would continue to run and perform required site control (including Spill Mitigation) regardless of the operational state of the SCADA. SPS sites interfaced various combinations of hardware into the SCADAPack RTU including:

- Rain Gauge
- Flow Meter
- Well Washer
- Chemical Dosing
- Fire Alarm
- Power Meter
- Soft Starters
- Variable Speed Drives
- Generator and ATS
- Additional I/O Modules

Schneider SCADAPack 357E

Each site also included a Magelis HMI connected via Modbus TCP directly to the RTU. The HMI was configured to view selected station and pump status, duty pump start and stop set-points and all site alarms. The HMI required operators to log-in to access the system and all log-in details were recorded as an additional security measure.

Schneider Trio ER450 Radio

Schneider Magelis HMI

DOCUMENTATION

Automation IT provided a fully documented Project Management Plan, with monthly progress reports for the duration of the project. All Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT) documents were provided along with a completed electrical drawing package consisting of more than 3500 individual drawings in total.

CONCLUSION

With the SCADA upgrade now completed for these Sewage Pump Stations, they are now easier for both operators and contractors to monitor and maintain. This platform also allows for future expansion and functionality without unnecessary complications. Automation IT are now a preferred supplier to Unitywater and have been listed as a pre-qualified supplier on the QLD State Governments 'Local Buy' network (Contract No. BUS 226-0212). Automation IT is also listed as an accredited supplier by the QLD State Governments GITC contract authority (GITC No. Q-4900).

Automation IT working with Government and infrastructure, making a better future for you.