The new Gold Coast University Hospital (GCUH) is at the forefront of expansion to the Queensland public health service infrastructure, and at one stage held the title of the largest hospital development ever undertaken in Queensland, this project contained a number of unique challenges.

Given the complex supply network, the main challenge was to be able to communicate to specific HLI devices such as meters and relays, the PLCs used Modbus Master/Slave Communication natively at each remote rack location. This was a major advantage for the RX3i platform as it eliminated the need for any third party communication cards to be installed in the racks. The net result was the most reliable solution possible at an excellent price and a happy customer!

The Gold Coast University Hospital under construction

To maintain site design consistency for the future, all PLC and SCADA programming specification, electrical drawing package, full test documentation, safety procedures and operation manuals. To maintain site design consistency for the future, all PLC and SCADA site standards were met.

COMMISSIONING
Before the final commissioning could take place, it was important to liaise with several different parties in order to overcome security precautions and scheduling issues. Scheduling was critical to ensure that commissioning of the existing switchboards and functional testing across the whole control network would not cause any power outages.

The commissioning process involved testing of all of the field and switchboard PLC IO, as well as full operational checks of all circuits and checking the operation of all equipment on the NCS. In the same way, each utility supply failure scenario was tested to ensure that the system operated correctly at each stage of the load shedding process. Each switchboard was tested to ensure a safe power down and restore sequence once the generators had powered up including the transfer of load back to mains power.

The SCADA view of the Gigabit Network Ring Coupling Switch

DOCUMENTATION
As with all Automation IT projects a fully documented project solution included monthly progress reports throughout, detailed software programming specification, electrical drawing package, full test documentation, safety procedures and operation manuals.

To maintain site design consistency for the future, all PLC and SCADA site standards were met.

CONCLUSION
As Network Control Systems are different for each application and environment, Automation IT was able to make a fully customised NCS solution for the Gold Coast University Hospital that was able to meet each of the specific requirements for the site.

With the use of the NCS, Automation IT was able to ensure the safety of everyone, as well as maintain vital operations at the hospital whenever a mains power failure occurs. Similarly, the NCS was also able to save Queensland Health money almost immediately after the system was brought online by decreasing the potential for human error operations as well as reducing the overall site energy consumption.

Ask Automation IT to create an NCS Solution for you today!

For each switchboard the SCADA system is able to provide:

- Circuit Breaker Pop-up Pages, providing the following additional information:
  - Device Status
  - Synchronisation Status
  - CB Control Status
  - Protection Relay Data
  - Metering Relay Data
  - Bus Zone trip status
  -CB Control Status
  -Bus Zone trip status
  -Bus 3-phase voltages
  -Substation control voltage and trip circuit supervision health status
  -Bus zone trip status
  -Bus zone trip status

The SCADA view of the Gigabit Network Ring Coupling Switch

A typical redundancy application segment using GE RX3i PLCs

SCADA SYSTEM
The chosen SCADA software for this project was CitectSCADA. Citect is able to provide high graphic process visualisation, superior alarm management and built-in reporting, which were all features that were essential for an NCS system of this size. The SCADA system is able to monitor and control the redundant PLCs via the Ethernet network. All NCS status information and control functions are able to be accessed using the SCADA system. Similarly, the SCADA servers were configured as a redundant pair so that if one PC fails, the other is able to immediately take over all necessary tasks and maintain control over the system. For each switchboard the SCADA system is able to provide:

- A graphical single line representation
- Device status (Inc Health, Fault, Open, Closed, Remote, Local, & Trip)
- Bus & Device energisation status
- Incomer voltage & current
- Bus 3-phase voltages
- Substation control voltage and trip circuit supervision health status
- Bus zone trip status
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A typical redundancy application segment using GE RX3i PLCs

A power down and restore sequence once the generators had powered up including the transfer of load back to mains power.

Preparing the Gold Coast University Hospital for its opening on 28 August 2013.

The solution required a redundant GE RX3i PLC solution with a network of distributed, redundant communication adapters at each of the main switchboards. In the result of a network failure, each substation is able to continue processing via a fully redundant pair so that if one PC fails, the other is able to immediately take over all necessary tasks and maintain control over the system.

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The SCADA system was brought online by decreasing the potential for human error operations as well as reducing the overall site energy consumption.

A substation mimic screen and popup

An overview of the Gold Coast Hospital NCS system diagram

A substation mimic screen and popup

-commissioning

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THE CHALLENGE
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Given the complex supply network, the main challenge was working out and accounting for each possible utility supply fail and restoration scenario that could happen within the system and ensuring that the NCS would be able to adjust accordingly.

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