

Automation IT responds to the most significant infrastructure investment in Queensland



The Millennium Arts Project, announced in 2000, was a major commitment by the Queensland Government to upgrade and expand arts and cultural facilities throughout Queensland. The Millennium Arts Project represented the most significant investment in the arts in this state in more than 30 years and one of the largest arts infrastructure projects undertaken in Australia.

Automation IT were contracted to provide a control system that would maintain electricity supplies to the Queensland Gallery of Modern Art, State Library of Queensland, Performing Arts, Drama Theatre, Museum and all associated infrastructure.

THE PROBLEM

The Queensland Government had to maintain a Cultural Centre prior to, during and after the construction phase. The complete project had to be carried out so that 'business as usual' continued without any downtime for the Cultural Centre.

THE CHALLENGE

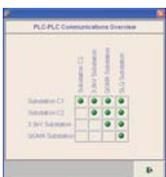
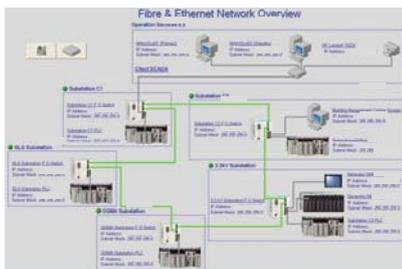
The Network Control System (NCS) is responsible for the detection of a power failure in the network, and the restoration of stand-by power until the normal power can be restored. The power fail scenarios monitored by the NCS are detailed in the list below:

- Loss of mains power to the Queensland Cultural Centre.
- (Full/Partial) Loss of power to the State Library.
- (Full/Partial) Loss of power to the Gallery of Modern Arts.
- (Full/Partial) Loss of power to the Central Energy Plant, Via BMCS.
- (Full/Partial) Loss of power to the Performing Arts Centre, Via BMCS.
- (Full/Partial) Loss of power to the Museum, Via BMCS.

While network design of such a system is paramount, the project implementation had to allow for the new facilities to be commissioned in parallel with the existing system.

THE SOLUTION

Automation IT designed a system using multiple Modicon Premium PLC's to allow control and monitoring of individual areas. Using Ethernet Hyper-Ring technology all controllers continuously monitor each other so, in the event of a communications loss i.e. partial power failure the remaining controllers maintain their own individual areas.

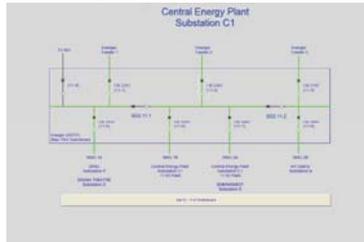


A PLC-PLC communication popup screen highlights any inter PLC communications failures.

CONTROL SYSTEM OVERVIEW

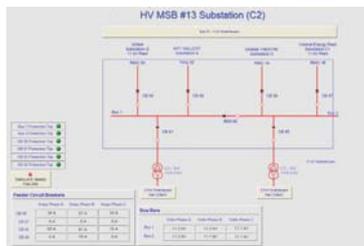
Automation IT based the control system around five Modicon Premium processors to maintain control at each of the following areas:

- Central Energy Plant Substation C1



The PLC at C1 provides monitoring of the Energex 11kV Incomers.

- Central Energy Plant Substation C2



The PLC at C2 provides control and monitoring of 11kV Distribution. The area of C2 also includes interfaces to the Honeywell Building Management System, Corporate Administration Agency (CAA) billing system and substation protection relays.

- Central Energy Plant 3.3kV Substation

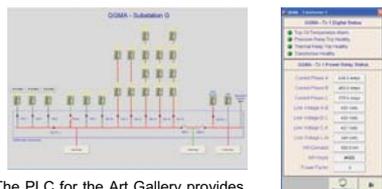


The PLC at the 3.3kV Substation provides control and monitoring of the 3.3kV Distribution. The area of the 3.3kV Substation also includes interfaces to substation protection relays and the Digital Master Controller (DMC) for the Standby Generators.

- State Library of Queensland

The PLC for the State Library provides control and monitoring of circuit breakers in its local area. The library PLC also includes distribution board contactor control and monitoring of a number of metering relays to enable successful load shedding in the event of a partial mains failure.

- Queensland Gallery of Modern Art



The PLC for the Art Gallery provides control and monitoring of circuit breakers in the local area. The Art Gallery PLC also includes distribution board contactor control and monitoring of a number of metering relays to enable successful load shedding in the event of a partial mains failure.

The complete control system provides an assurance for the public that Queensland's premier Arts and Cultural Centre will continue to operate in the event of a mains or partial black out. This is achieved using standby generators and intelligent load shedding arrangements across the site.

DOCUMENTATION

In addition to comprehensive manuals for both maintenance personnel and operators Automation IT developed additional SCADA pages and popups to show detailed equipment status and control system operation.

Circuit breakers provide status to the level of open, closed, remote/local operation, racked out position, protection relay trip and individual phase amps.



In the event of a mains or partial mains failure scenario screens are available to indicate the failure sequence steps.



REPORTS

To provide improved system fault finding AIT took advantage of the CitectSCADA built in Process Analyst, a facility that is standard with CitectSCADA v6.0 software.

The Analyst allows personnel to compare values against a timeline to ascertain why a particular site event may have occurred.



CONCLUSION

When you provide a quality product for companies such as Cummins and Bovis Lend Lease a mutually beneficial partnership is developed. Since completing this project AIT have done a number of similar projects with Cummins. At the time of print the Brisbane International Airport (BAC) standby power system for the new Terminal T3 and Runway upgrade was one of them.

