Application Bulletin
PMCS-AU-0010

Queen Elizabeth II Medical Centre

Woodward EasYgen3500 and LS5 Controllers Simplify Complex Operations and Maximise Efficiency of New Central Energy Plant at Queen Elizabeth II Medical Centre in Western Australia

Solutions

- Woodward EasYgen 3500 generator controllers
- Woodward LS5 remote breaker controller

Results

- Simplification of complex operations
- Maximal efficiency of new central energy plant

Local Integrator

MTU Detroit Diesel Australia
PROFESSIONAL POWER PEOPLE

Background

The 28-hectare Queen Elizabeth II Medical Centre (QEIIMC) in Perth, Australia, is the largest medical centre in the southern hemisphere and is globally recognized in health care, research and education. Since 2010, when Stage 1 of the Medical Center's redevelopment began, numerous projects have been completed, including a new Central Energy Plant (CEP). The new CEP was critical to the growth of the QEIIMC as it comprises all mechanical and electrical services such as providing hot and chilled water, emergency power, medical gasses and reverse osmosis water for clinical use. Its MTU generators and boilers are the latest in technology and will operate more efficiently with lower emissions than the CEP it is replacing.

Challenge

MTU Perth contacted PM Control Australia requesting for a solution that would provide seamless synchronization and load control over all the required interconnections and in all scenarios. In addition, MTU requested a system that would not require extensive external PLC programming. Up until this point no other control system supplier had proven to be up to the challenge.

Solution

PM Control advised, supplied and assisted with the commissioning of following products:

- Woodward EasYgen 3500 generator controllers
- Woodward LS5 remote breaker controller

This latest generation of the proven Woodward easYgen control line provides the ultimate in control flexibility whereby up to 32 generators and 16 independent breakers can be fully controlled in nearly any imaginable power management scenario.

The emergency power system consists of five MTU emergency diesel gensets rated at 2.2MW in a standby configuration. The system is connected to two main feeders that are connecting the emergency power system to a common substation. The gensets are primarily used for emergency back-up purposes, however, when additional power is required the gensets can soft transfer the load from the utility and run in isolated groups to supply power to the chillers.

During normal operation both feeders from the substation are closed and the bus-tie between engine group 1 and engine group 2 is open. In addition to the 5 MTU diesel gensets a 2100 kW continuous prime rating gas powered MTU CHP (Combined Heat and Power) genset is fitted to the bus network. This genset, also known as a gas co-generator, runs in parallel with the utility and provides heat for the QE2 complex.

PM CONTROL

In the event of a utility power failure the gas engine is disconnected from the utility and the diesel gensets will start to supply back-up power. Each engine group re-synchronise with the utility when power becomes available again. Each engine group can operate independent of each other. If both utilities fail the engine group bus-tie will be closed and the entire group will supply power to the QE2 complex.

After a 20-minute period the EasYgen's Load Dependent Start/Stop (LDSS) capacity management is instigated (LDSS is used for single side failure as well). The gas engine can also be started in islanded mode and can run in isochronous load sharing with the diesel gensets.

Operation data from the Easygen's and LS5's, as well as all J1939 engine data, can be monitored externally through the Modbus Ethernet communications network.

Installation & Commissioning
PM Control provided MTU with off-site engineering and on-site commissioning services to assist the with the correct system implementation. On-site construction began in February 2011 at the western end of the site and the new CEP was commissioned in October 2012.

Results

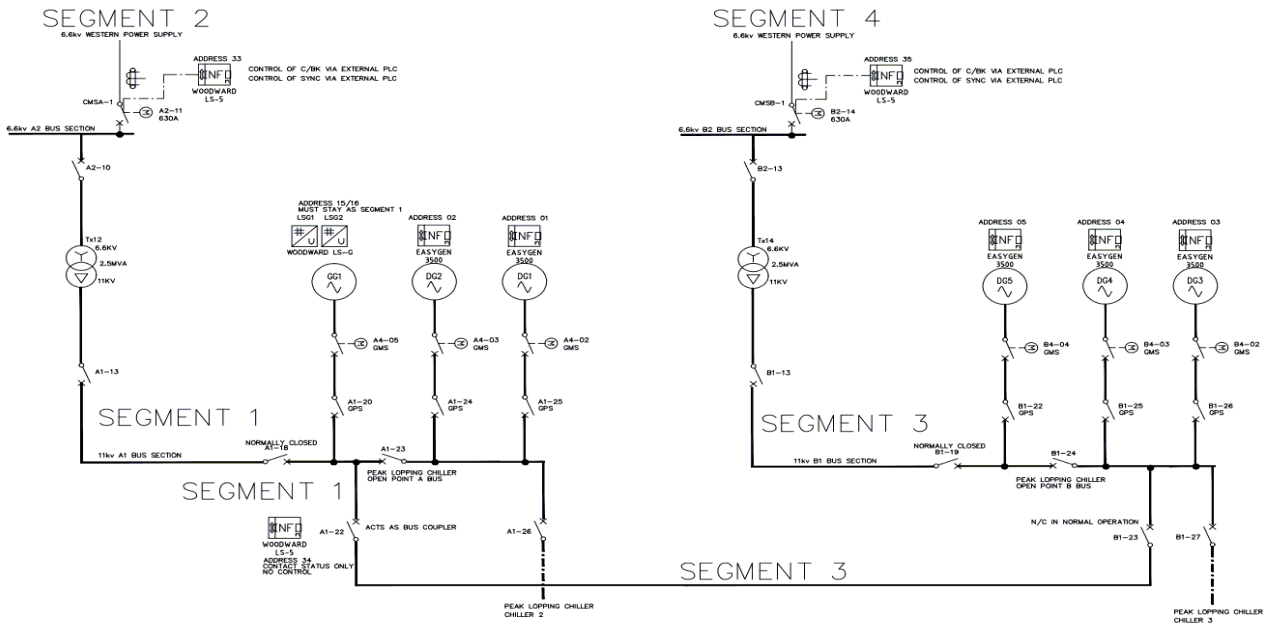
- Successful simplification of a complex power management arrangement using standard out-of-the-box Woodward controllers
- "The Woodward controllers made the integration job such a breeze and just worked without ever missing a beat" (MTU Perth)

Since commissioning the CEP has provided flawless back up power on a number of occasions and complex operations have become much simpler and more flexible thanks to the EasYgen 3500 and the LS5 controllers. The new system provides QEIIMC with full synchronization and load control over all required interconnections, ensuring maximal availability and reliability of power at the new Central Energy Plant. The Woodward control system is now the equipment of choice for any forthcoming installations for this client.

About PM Control

PM Control delivers energy optimisation solutions that increase efficiency while lowering emissions. Serving the energy, process and transportation markets, PM Control is the appointed distributor and recognized retrofit partner for Woodward Inc., Regional Technical Center for ABB Switzerland and Value Added Reseller for L&S Electric. Through our activities PM Control is having a positive impact on the lives of people across SE Asia, Australasia, India and beyond.

System Overview



Singapore
PM Control Systems Pte Ltd
No. 8 Joo Koon Crescent, Singapore 629011
Tel.: +65 6779 2822 | Fax: +65 6777 6301 | singapore@pmcontrol.com

New Delhi, India
PM Control Systems (India) Pvt Ltd
14/3 Mathura Road, Plot No. 4
Faridabad 121003 | Haryana, India
Tel: +91 129 6543114-29 | delhi@pmcontrol.com

Sydney, Australia
PM Control Systems (Aust) Pty Ltd
Unit 1, 1 Wirega Avenue
Kingsgrove, NSW 2208, Australia
Tel: +61 (0)2 9758 2322 | Fax: (0)2 9750 6272 | sydney@pmcontrol.com

Batam, Indonesia
PT PM Control Systems
Komp. Taman Niaga Sukajadi | Blok H1 No. 1 Batam 29400
Kepulauan Riau, Indonesia
Tel: +62 778 737 2221 | Fax: +62 778 737 2216 | batam@pmcontrol.com

Jakarta, Indonesia
PT PM Control Systems
Sentra Bisnis Artha Gading | Blok A 7C/25 Kelapa Gading
Jakarta Utara 14240, Indonesia
Tel: +62 21 4585 7266 | Fax: +62 21 4585 7267 | jakarta@pmcontrol.com