Infrastructure

Bridges

Port River Expressway
South Australia

Client ABI Group / Nilsen

Location Port Adelaide, South Australia

Value $1.4 Million

Duration 2007 – 2008

Project Overview

The Port River Expressway project was the first stage of a $1 billion program of works initiated by the South Australian Government.

The improvements reinforce the Port of Adelaide as a vibrant centre of activity and world-class import/export hub for South Australia.

Capabilities Demonstrated

- Design development and design management
- Estimating, cost planning, scheduling and procurement management
- SCADA and PLC control programming, redundant design, debugging and networking
- Interfacing multiple systems and communication protocols
- Low/medium voltage electrical design/installation
- Meeting unique complex technical requirements
- Project Management with seamless interfacing between stakeholders and relevant authorities
- Risk management and mitigation

Project Highlights

SAGE was awarded the contract to provide the Plant Management and Control System (PMCS), which monitors and controls the functions of the bridges.

The PMCS has been designed with remote operation being a key criterion; hence the system architecture was selected to provide a robust, high speed interface capable of operating over long distances, on the existing infrastructure. To achieve this, an Ethernet network was selected as the backbone of the communication system.

The bridge control PLCs (located locally at each bridge) are from the Allen Bradley ControlLogix family enabling excellent Ethernet communications capability. The SCADA system selected was Citect, to provide system redundancy with multiple computers. The PMCS interfaces with the Transport SA's Traffic Management System (TMS), providing status information for the bridges and allowing the automatic opening and closing of the bridges through the TMS system.

The PMCS was designed to address many challenging requirements and be fail-safe. At the time of its development it was one of the first control systems designed to allow remote operation of a bridge. It was designed to allow the following control modes; remote operation, local control or emergency control.

"Attention to detail during factory acceptance testing was a signficant factor in the project success"

Nilsen Project Manager – Rod Garrett

Project Outcomes

- Manual control via SCADA: The control philosophy for the Citect system is based on a redundant server philosophy.

- Automatic control: each bridge has two ControlLogix PLCs configured in a redundant controller configuration.

- The fibre-optic link going over the river for I/O control on the western bank

- The redundant ControlNet network used for I/O control

- The ControlNet to DeviceNet converter module, allowing the integration of the two networks.

- Manual controls via push buttons

- Emergency controls

Winner 2010 Process and Control Engineering (PACE) Zenith Awards – Infrastructure Category