

Semangar Water Supply Scheme

Location : Kota Tinggi, Johor, Malaysia
Client : SAJ Holdings Sdn. Bhd.
Consultant : Ranhill Bersekutu Sdn. Bhd

Capacity : 318.2MLD
Commencement Date : May 2001
Completion Date : January 2004



Introduction

Semangar Water Supply Scheme is implemented in two stages. The ultimate capacity of the scheme when fully developed is 318.2MLD. Each stage supplies 159.1MLD of treated water to the demand areas. The works implemented in Stage 1 Works of the scheme have augmented the existing supplies by 159.1MLD of treated water to serve demand areas in Johor Bahru District and environs when completed.

Raw water is extracted from Sg. Johor through a river intake near Kg. Semangar and pumped to the treatment plant located approximately 0.7km apart. After treatment, the treated water is pumped to the balancing reservoir located on a hill next to Bukit 75 for supply. The balancing reservoir is about 10km away from the treatment plant.



Description

To assist in operation and management of the water treatment plant, a Telemetry and SCADA System is provided. The system is capable of performing the following functions:-

Monitoring of water quality, levels, pressures and flows throughout the treatment process.



- Monitoring and control of treatment process units, pumping and electrical equipment.
- Remotely vary the raw water pumping flow and treated water pumping flow.
- Remotely vary dose rate of chemical dosing pump, opening and closing of valves and control of other items in chemical plants and perform online dosing of chemicals in peace with the water flow.
- Automation of chemical solution preparation.
- Automation of filter backwash.
- Monitoring of water level and flow at reservoirs.
- Generating of maintenance schedule.
- Generating of operational summary report and water quality report.
- Perform other functions as in described in the control scheme that include automatic adjustment of raw water and treated water pumping to match production with demand.

Project Scope

The scope of works covers the supply, installation, testing and commissioning of the instrumentation systems. The installation includes the following:-

Intake

- Supply, install and commission all instruments for the Intake Works.

Treatment

- Supply, install, connect, test, calibrate and commission all instrument measurements of levels, pressures, flows and water quality throughout the treatment works for display on the local control panels and also in the Command Centre of the Administration Building.
- Design, install, connect, test, calibrate and commission instrumentation panels in the treatment plant.
- Supply spare parts and consumables for the entire installation.
- All associated cabling and connections.

Balancing Reservoir

- Supply, install, test, calibrate and commission all instrument measurements of levels and flows through radio-link telemetry system for display on SCADA system in command centre of the administration building.
- All associated cabling and connections.

System Configuration

The SCADA System consists of two main locations:

Intake and Treatment Works.
Bukit 75 Balancing Reservoir.

These locations are linked using radio telemetry system. The PLC based outstations transmit and receive data to and from the servers. These PLCs control the plant sequential functions. All SCADA and PLC nodes are linked to the same backbone to ensure data integrity as well as providing a platform to make possible scalable architecture features i.e. scalable/expandable from existing system up to future requirements of Stage 2.

The SCADA System is built around 100Mbit/s Ethernet ring redundancy fibre optic backbone that accommodates 100% redundancy in inter-equipment communications. The Ethernet backbones, which comply with IEEE802.3 specifications, handle all network traffic and anti-collision work loads.

A LCD rear projection system is used to project the above-mentioned graphics.

The visual display is an AP/LCD rear-projection display system designed for both digital signage and wall-

based visual messaging applications in wide variety of environments. Projection of specified displays on this screen can be selected through any of the operator's station in the Command Centre.



A security CCTV system is installed at various points around the vicinity of the intake and treatment works. This CCTV system is used to provide 24 hours remote monitoring and also the video confirmation of the plants status before and after remote activation from the command centre. The CCTV system is based on modern video technology using colour digital cameras, optical transmission system to ensure safe, trouble-free and reliable data transmission.

The system is designed to receive clear and interference-free colour transmission. The system is fully tropicalised, solid-state type suitable for use on a 240V 50Hz supply. All equipment is self-contained and of the same manufacture throughout. All sub-units and accessories are properly matched to ensure a high degree of quality for the whole system.

