

Sungai Selangor Phase 3 Water Supply Scheme

Location : Selangor, Malaysia
Client : SPLASH Sdn. Bhd.
Consultant : SMHB Sdn. Bhd.

Capacity : 800MLD
Commencement Date : May 2001
Completion Date : March 2006

Introduction

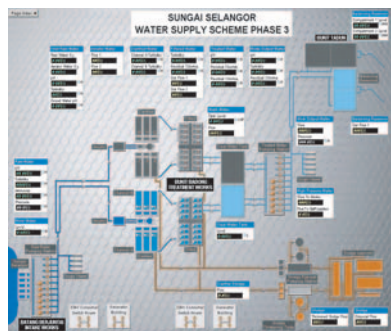
The Sungai Selangor Phase 3 Water Works is located to the south of the existing Phase 2 Treatment Works. The works is implemented in two stages, Stage 1 and Stage 2, which operate independently each with a nominal work output of 400MLD.

The water treatment structures for each stage include an aerator, a chemical mixing chamber, clarification tanks, filters, chlorine contact tanks and clear water tanks. There is also a chemical building, chlorine building, administration building, wash water and sludge disposal works, and all associated roads and services.

Description

The raw water is extracted from the river intake located upstream of the existing Phase 1 and Phase 2 river intakes, on the left bank of Sg. Selangor. It is pumped to the treatment inlet and discharged over a weir into a cascaded aerator; at the outlet of the aerator, the water is dosed for pre-chlorination and then passed on to the chemical mixing chamber where it is dosed for coagulation and flocculation. The conditioned water is passed through the clarifiers and the rapid gravity filters. Chlorine and fluoride are added before the treated water flows into the clear water tanks.

Sludge from the clarifier's flows to the thickening tanks via a holding tank. Filter waste wash water is collected in wash water recovery tanks; the supernatant may be returned to the works inlet and the sludge pumped to the thickening tanks again where the sludge is mixed with the clarifier sludge. Facilities are provided for the thickening tank supernatant to be discharged into the overflow system. There is also a mechanical dewatering of the thickened sludge from the thickening tanks. The thickened sludge from the thickening tanks is pumped directly to the sludge lagoons.



The plant is designed so that the treatment works is operated with minimum personnel. All preparation of chemicals for use during the next 24 hours is carried out during the 8 hour day shift. Routine plant maintenance is generally carried out on weekdays in the daytime. The plant is capable of unmanned operation at all other times under normal operating conditions. In the event of failure of the duty dosing plant, the standby plant operates automatically to take over the functions of the failed duty plant.



There is a Command Centre in the Administration Building; facilities are provided there for monitoring the operation of the pumping stations and the water treatment works. Facilities are also provided in the Command Centre for the control of the raw water and treated water pumps, selected valves and penstocks, chemical dosing, etc.

Project Scope

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

Intake

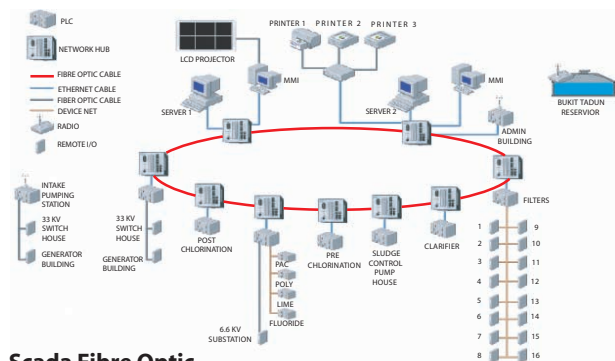
- Supply, install and commission all instruments for the Intake Works.

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.



Scada Fibre Optic

The SCADA System consists of 3 main locations as follows.

1. Intake Works
2. Treatment Works
3. Bukit Tadun Balancing Reservoir

All the 3 main locations are link by redundant radio telemetry system.

The PLC-based Outstations (O/S) transmits all process data, events, alarms and commands to the SCADA server and further shared among all the other operator MMI and engineering workstations. The PLC-based intelligent Outstations perform the role of Local Controller units for the plant sequential control functions. All SCADA nodes and PLC control nodes (Outstations) 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 from existing system size up to possible expansion of system in stage 2 (future). The redundant SCADA nodes (Data Server) will also serve as one of the main operators MMI or Engineering Stations.

The complete integrated SCADA system is built around 100 Mbit/s Ethernet ring redundancy fibre optic backbone that accommodate 100% redundancy in inter-equipment communications.

The CC computer terminals and all the O/S's will be provided with back-up power supply through Uninterruptible Power Supply UPS systems. The battery banks will be capable of providing back up power to the master station equipment (O/S 15) for 4 hours and 3 hours for the rest of O/S's after loss of incoming power supplies.

The SCADA system is able to adjust all set points and timers in the local PLCs or download a new program into these PLCs, if necessary.

Local control panels LCPs and Supervisory Panels will house the O/S's (PLCs) and to perform the automatic and sequence control functions for the processes that these LCPs or supervisory panels are meant for.

The whole SCADA system will be designed such that with the loss of the host computers or sub-master stations, it will not impair the efficiency of the system to carry out the local automatic and sequence controls via these LCPs or Supervisory Panels.