

# Success Story

*Yokogawa's Powerful SCADA System Integration Contributing to the Stable Supply of Drinking Water & Sewage Management for Bengaluru*

## Bangalore Water Supply and Sewerage Board

**Location:** Bengaluru, India  
**Order date:** November 2013  
**Completion:** May 2015  
**Industry:** Water & Wastewater



### Executive Summary

Bengaluru, the capital city of Karnataka, is the third largest city and the fifth largest metropolitan area in India and is one of the fastest growing metropolitan cities. It is a center for the education, information technology (IT) and biotechnology (BT) industries, sophisticated high tech healthcare and many other industries, attracting people to the city. According to a census in 2011, the population of Bengaluru city was about 8.5 million. The Bangalore Water Supply and Sewerage Board (BWSSB) was one of the first water supply and sanitation utilities in India, having been set up in 1964 to meet the water supply and sewage disposal needs of the city covering an area of about 800 sq. km.

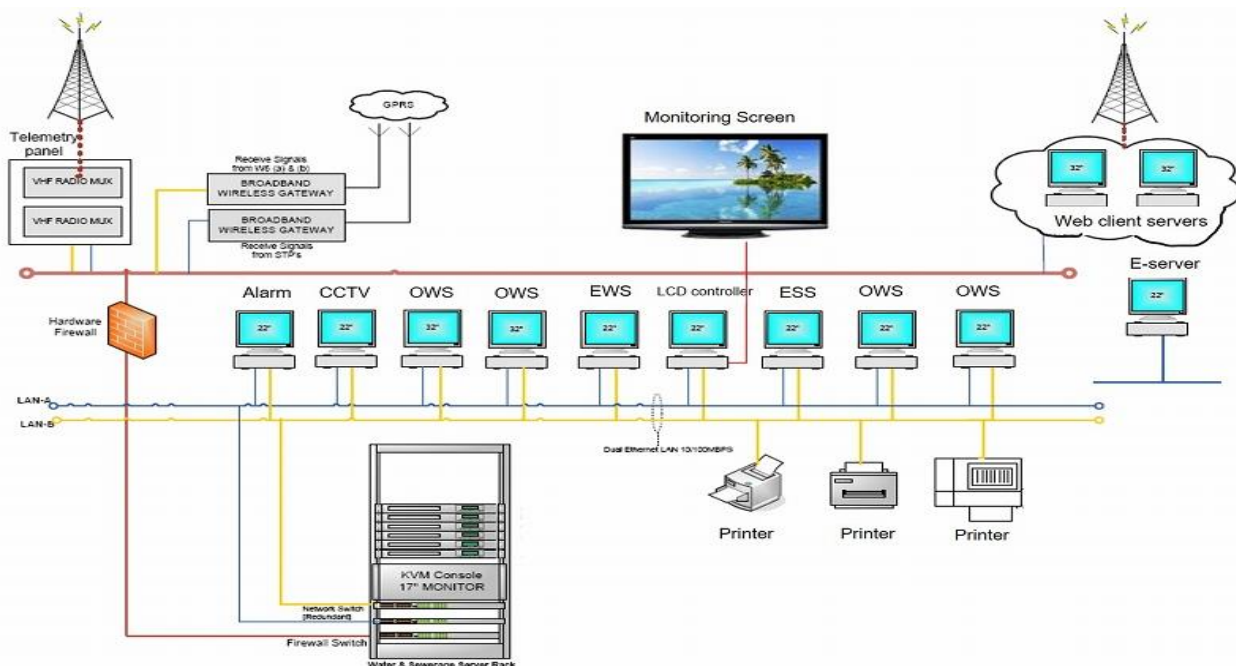
Due to rapid industrial development and population growth in recent years, the city suffers from frequent water outages. The construction of modern infrastructure for water and sewage facilities to supply safe and clean water stably and to treat sewage water appropriately for sanitation has been an urgent issue for BWSSB. Accordingly, BWSSB has been developing water and sewage treatment related facilities, such as water treatment plants, pumping stations, reservoirs, water networks, sewage networks, and sewage treatment plants under long-term phased plans. Building a new Centralized SCADA Monitoring Center (CSMC) in Bengaluru is part of these plans.

The new CSMC was built with financial assistance from the Japan International Cooperation Agency (JICA). It integrates the current BWSSB water related facilities in Bengaluru, allowing them to be monitored in real time.

Yokogawa India Ltd. (YIL) received a turn-key basis contract from BWSSB. YIL delivered the FAST/TOOLS SCADA system and STARDOM network-based control to CSMC. YIL was responsible for the design, supply, installation, testing, and commissioning, including a seven-year operation and maintenance contract for products delivered by Yokogawa.

CSMC monitors most of the BWSSB water related facilities which are located over a wide area of Bengaluru. The main facilities currently monitored by CSMC are:

- Water treatment plant/intermediate water pumping stations
- Ground level reservoirs
- Sewage treatment plants
- Intermediate sewage pumping stations
- More than 500 Districted Metered Area (DMA) data from third parties through an OPC server



## The Challenges and the Solutions

### Integration of the current BWSSB water and sewage facilities located throughout Bengaluru over VHF and GPRS

CSMC collects and monitors data from the BWSSB water related facilities in Bengaluru. To integrate the existing BWSSB facilities which are widely dispersed, telecommunication links are mandatory for SCADA. FAST/TOOLS can handle various telecommunication links and protocols, enabling BWSSB's remote facilities to integrate with CSMC over VHF and GPRS. Thus, total system integration and data transmission have been successfully realized.



Antenna tower

Some facilities already have third-party systems. FAST/TOOLS uses industry standards such as OPC, ODBC, FTP and Modbus to connect with other vendors' products and systems. FTP communication is used between third parties' SCADAs and FAST/TOOLS at CSMC.

Examples of the data collected from each water related facility include the following.

- Water treatment plant: Raw water inflow quantity, raw water turbidity, treated water quantity, residual chlorine, treated water turbidity, power consumption
- Pumping station: Discharge pressure, power consumption, individual pump discharge, individual pump power consumption
- Ground level reservoirs: Process flow, cumulative flow, reservoir level
- 20 sewage treatment plants: Online treated water quality monitoring (pH, biochemical oxygen demand [BOD], chemical oxygen demand [COD], total suspended solids [TSS], color, dissolved oxygen [DO], temperature, ammonium, and total nitrogen)

The total number of configured tags exceeds half a million. FAST/TOOLS gathers all this water-related data so that BWSSB can grasp the current situation of water supply and sewage treatment in Bengaluru in real time.



Head office

### Stable CSMC operation

As a key infrastructure for both water and sewage related facilities, CSMC is required to run 24/7 without failing. To ensure stable monitoring at CSMC, SCADA servers and communication lines such as Ethernet, GPRS and VHF are all redundant. Firewalls protect cybersecurity, an access control system is provided for enhanced security, and CSMC is monitored by CCTV. In addition to a UPS and battery backup, a diesel generator is on standby in case of power outages.

In addition to the above, prompt service and support provided under the seven-year operation and maintenance contract also keep CSMC running stably.

## Customer Satisfaction

At CSMC, managers can monitor the current water situation in Bengaluru as a whole in real time, which is invaluable for deciding to which area they should supply limited water resources. CSMC has thus become the heart of Bengaluru's water infrastructure.

In future, other systems such as billing will be integrated into the CSMC system to further improve operating efficiency and services to citizens.



Control room

### For more information and contact

[FAST/TOOLS](#)

[STARDOM](#)

[Water Industry](#)

### Yokogawa Electric Corporation

World Headquarters

9-32, Nakacho2-chome, Musashino-shi, Tokyo 180-8750, Japan

[www.yokogawa.com](http://www.yokogawa.com)

### Yokogawa India Ltd.

Plot No.96, Electronic City Complex, Hosur Road, Bangalore - 560 100, India

[www.yokogawa.com/in/](http://www.yokogawa.com/in/)