



Overview

Country or Region: India

Industry: Water

Customer Profile

Delhi Jal Board (DJB) is the government agency which manages one of the largest water infrastructures in New Delhi, spanning a network of 11350 km which serves nearly 18 million consumers. The utility is responsible for the production and distribution of potable water as well as for collection, treatment and disposal of domestic sewage in the capital. It also manages a complex water supply system which carries water to various areas, based on requirements.

Integrated water management system for Delhi Jal Board.



Need

Delhi is one of India's fastest growing metropolises. From among the six Indian mega-cities having a population of over 5 million people, only Delhi's population grew at an annual growth rate exceeding 4% during the last decade. Due to this, the water supply in Delhi has been under strain and it has been facing scarcity of water resources.

DJB is responsible for entire Delhi's water supply and sewage system. It owns and operates several Water Treatment Plants (WTPs) and associated pumping and booster pumping sub-stations to serve the citizens of Delhi. One such WTP is Bhagirathi, which was designed and commissioned in the year 1983. It works on proven conventional treatment technologies. It provides quality potable water 24x7 to entire east Delhi covering a population of 40 lakhs.

DJB has decided to improve operations of Bhagirathi's WTP by minimising operation and maintenance costs, minimising water losses due to wastages and monitoring effective utilisation of water and power.

DJB conducted multiple surveys by engaging various consultants. Based on their reports, DJB concluded that by rehabilitation and automation of the plant and outsourcing its operation and maintenance, it would be possible to: reduce the cost of portable water production, save electricity charges and effectively utilise manpower. Incurring a marginal cost would result in total rehabilitation of the plant, thus giving it a

new look. It would also enhance equipment life and equip the plant to run for many more years.

The task of implementing this project, the first of its kind, was awarded to Larsen & Toubro's Construction Group. The entire Bhagirathi WTP was handed over to it for rehabilitation and automation, with one year defect liability and 10 years of operation and maintenance.

The existing Bhagirathi WTP being manually operated, was not flexible and did not allow DJB to react quickly to variation in water demand. In addition, there was substantial loss of water (in excess of 10 MGD) both from sludge drainage and filter backwash. In order to reduce the loss of water, it was necessary to operate the plant in auto mode.

L&T Construction awarded the contract for turnkey electrical, control and instrumentation solution for Bhagirathi WTP and Distribution Areas to L&T Electrical & Automation's C&A business unit, which is one of India's leading electrical & automation companies.

As part of the contract, C&A was responsible for the design, engineering, development, testing and commissioning of a state-of-the-art SCADA system, control systems along with instruments for automation of Bhagirathi WTP with the Central Control Room at Bhagirathi, Muradnagar Pumping Station, Sangam Raw Water Pump House, Distribution Control Room, 21 nos underground reservoirs across Delhi and 5 control stations for operators.

About Us

L&T Control & Automation (C&A) is a Strategic Business Unit of L&T Electrical & Automation. It is a part of Larsen & Toubro – the multi-billion India-based conglomerate. L&T's C&A business is market leader in delivering integrated electrical & automation solutions in India and overseas. With over three decades of experience in diverse industry segments, C&A delivers value through comprehensive solutions based on varied technology platforms and incorporates the benefits of its wide-ranging experience. L&T's state-of-the-art Electrical & Automation Campus at Navi Mumbai in India has the latest testing and manufacturing equipment. It incorporates a modular manufacturing unit, an application software laboratory and a fully networked office for engineering and project management.

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Oil & Gas

Upstream, Midstream and Downstream

- Integrated Process Control
- Pipeline SCADA
- Emergency Shutdown and Fire & Gas
- Terminal Automation & Tank Farm

Power

Generation, Transmission and Distribution

- Integrated controls for Boilers and Turbines
- Station C&I
- E, C&I for CHP, AHP, WTP
- E&I for Solar Plants
- Smart Grid

Infrastructure

Highways, Ports and Metro Railways

- Highway Traffic Management
- Metro Rail BMS & AFC
- Airport Baggage Handling
- Power Management
- Smart City & ITS

Buildings

Hotels, Hospitals, Factories, Malls, Data Centres

- Substation
- MV / LV Power Distribution System
- ELV / CCTV / Fire Detection & Alarm Systems (FDAS) with suppression solution
- Access Control
- Lighting Control

To achieve the desired level of automation for remote monitoring and control, C&A installed *iVision_{max}* SCADA with Programmable Logic Controllers (PLCs) and Remote Terminal Units.

As part of this, C&A has commissioned 7 nos Hot Redundant PLC system with SCADA, 21 nos RTUs, 48 Standalone PLC panels and consoles, SCADA, setup wireless network and central command centre. All these systems connected with each other on multiple communication channels including GPRS, WiFi, leased line and Local LAN.

1. SCADA for Remote Monitoring at Distribution Central Control room at Mandawali BPS on leased line.
2. SCADA on Web Interface at office of DJB Headquarters.
3. RTU at 21 underground reservoir locations, over GPRS Network to monitor various Convert Rooms mentioned above.
4. RTU inside plant for 8 Nos Clarifiers over WiFi.

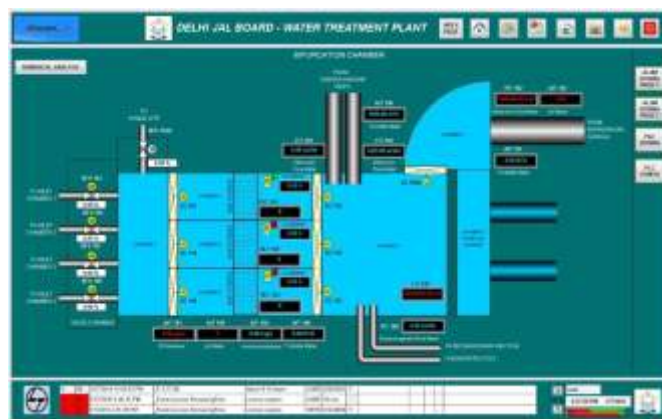
The SCADA solutions monitor and control Bhagirathi WTP, Substation, Chemical house, 2 Filter houses with 40 nos filter console desks, Sludge pump house, Dirty Backwash pump house, 10 MGDs, 6 MGD Recycling plants, Sangam Raw water Pump house and Murad pumping station.

The distributed architecture helps in remote monitoring and management of 21 nos underground reservoir units (UGR), 20 wells using the GPRS data transmission.

The systems communicate with a variety of sensors to monitor parameters such as flow and pressure from water sources into tanks, flow and pressure from tanks into the towns and tank level. It also controls pumps and valves in each station to allow or disallow the water flowing to the other.

The *iVision_{max}* SCADA allows operators to view the status of pumps and water levels. The software which can generate alarms, allows users to access their system information over the internet using web client.

The system comprises redundant server



configured in main/standby set-up, with the standby server operating from the disaster recovery site.

Accurate real-time alerts and online reports provided over web through user friendly dashboards, help DJB in close monitoring of operations, identification of losses, decision support and automation of operations, improving efficiency and network command.

Result

DJB is now able to monitor the entire operation and performance of equipment in real time. It provides visibility and early awareness of potential problems, which has averted critical issues in several cases.

Some of the benefits after the implementation of reliable and cost-effective L&T *iVisionmax* SCADA solution at DJB are summarised below:

- Improved and/or consistent product quality
- Repeatable performance
- Greater environmental compliance and values
- Increased productivity
- Reduction in downtime and maintenance costs
- Reduction in operation costs
- Use of manpower in other value creating activities
- Availability of accurate data/information, enabling timely decision making and better process control
- Real time information minimises the reaction time to problems and prevents critical situations. It also provides precise and real time guidance to the field service team so that problems can be quickly identified.
- Greater customer satisfaction