

***CHAPTER 04 - Masterplan on Automation for Smart Water Management***



**4.1 Introduction:**

Dhaka Water Supply and Sewerage Authority (DWASA) is the Government authority for water supply and sewage disposal of the city Dhaka, DWASA operates a big water network. The pumping stations equipped with deep tube wells, are the main network nodes of the system. DWASA management wants to implement a SCADA (Supervisory Control and Acquisition) system in the network, complete with remote monitoring and control. For that reason, DWASA management had formed a committee to produce a conceptual overview to WASA for a unified, fully integrated Central SCADA Platform with Interactive loT and HMI Dashboard. The report meant to provide a brief overview of the architecture and framework that has been envisioned by the SCADA Committee for deploying the ideal solution at Dhaka WASA. This automation guideline was meant to guide water production and distribution monitoring and control processes mainly.

The following were the scope of work for that committee:

1. SCADA Software Specification Preparation
2. Detail specification preparation of required field devices
3. Specified of Standard Communication Protocol
4. Proposed common platform to integrate DTW, Meter, Valve and Treatment Plant's SCADA or non-SCADA data.
5. Compatibility assessment of existing piloting SCADA.

**4.2 Existing Status of SCADA:**

In 2017, Dhaka WASA started the piloting project work for DTW (Deep Tube Well) SCADA, and has covered 163 out of 913 DTW under SCADA systems. Around 8 (eight) company was done this work. Above them 77 DTW has done by one vendor and he had sold the License software to Dhaka WASA and also found that the software is not perfect to fulfil WASA requirements. All SCADA are running under the vendor-controlled demo software. Vendors used several different field devices as well as different demo software which is running at vendor end. On the other hand, total 23 used such communication device which are infeasible to integrate into central SCADA.

Two type of standardized Demo software was used named Rockwell Talk View and SIEMENS WINCC software. On the other hand, one company had used own developed customized software which is cloud based hosting.

Water Treatment Plant SCADA: In Dhaka WASA, Three WTP has used SCADA for Plant. All SCADA brand are Schneider.

**4.3 Dividing the Requirements:**

The Committee divided WASA's requirements for SCADA automation for smart water management into 4 parts

Its compatibility from Deep Tube Well, District Metered Area and Water Treatment Plant - all the way to Central SCADA will be possible as long as standardized along international best practices. The four requirements are described with their functionality as below.

1. Field Devices
   1. Collect data from Field
   2. Monitoring Status of Equipment
   3. Control Equipment
   4. Communicating with remote station
2. Communication Network
   1. Used protocol to communicate or send/receive data
   2. Between field devices and Central SCADA
3. SCADA Software Platform
   1. Application Data Acquisition & Supervisory control by Zonal Personnel
   2. Device Configuration
   3. Central data preservation and distribution
   4. Template creation for operation and management
4. Common Infrastructure and Computer-network hardware
   1. Establish Data center or operation room
   2. Establish communication tool
   3. Install software
   4. Establish video wall

**4.4 Compatibility assessment**

DWASA aims to integrate of the existing SCADA with Central SCADA. Future expansion and up-gradating will be made under proposed system.

Following challenges were determined-

1. Current SCADA servers are located remotely on vendor’s servers or on cloud servers, not in Dhaka WASA office.
2. Each contractor implemented its own device and software.
3. No compatibility in Field Remote Terminal Units, Communication & Network.
4. Current SCADA software makes the integration into Central SCADA infeasible.
5. Dhaka WASA local office does not possess the ownership of the data and server control.

**4.5 Major Integration steps:-**

1. Micro-controller based system shall be replaced with PLC (programmable logic controller)-based system which have compatible communication system.
2. Electric meter, Water Flow meter shall be connected to PLC in order to maintain records.
3. Old software cannot be integrated into new central SCADA. Only hardware can be saved through required modification to certain degree.
4. Those are general requirement. Individual system in each DTW shall be closely examined to determine required modification and/or replacement in order to integrate to zonal or central SCADA.