

***CHAPTER 04 - Masterplan on Automation for Smart Water Management: Digital WASA***



**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 for DTW 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 (which is yet not implemented) and also found that the software is not perfect to fulfil WASA requirements. All SCADA are running under the vendor-controlled demo software. In the above table 2.0 shows that several vendors used several RTU/PLC as well as different demo software which is running at vendor end. On the other hand, total 23 used Micro-controller-based 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 been used SCADA for Plant. All SCADA brand are Schneider/AVEVA.

4.3 Dividing the Requirements:

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

Its compatibility from DTW, DMA, WTP 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

Key Components to be standardized is Compatibility throughout DWASA Facilities

5.1 Compatibility assessment of existing piloting SCADA

DWASA aims at the future integrate of the existing SCADA with Central SCADA

Future expansion and up gradating will be made under proposed system. So Committee

recommends the following with their assessment.

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SCADA servers are located remotely, not in Mods zone office or Central . Mods zone

office is just a dummy terminal.

Each contractor implemented its own way. No compatibility in RTU, Comm & Network,

SCADA software, which makes the integration into Central SCADA infeasible.

Mods zone office does not possess the ownership of the data and control.

5.1.1 Incorporation Present SCADA into Central SCADA:

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Micro-controller based system shall be replaced with PLC-based system

PLC-based system shall have the function of Modbus serial and Modbus TCP for

communication within DTW and to zonal or central SCADA.

Electric meter, LIT, PIT, Flow meter shall be connected to PLC in order to maintain the

consistency and compatibility.

The software cannot be integrated into central SCADA. Only hardware can be saved

through required modification to certain degree.

The above is 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.