Use of Profibus at National Water Company
Jeddah Business Unit

Presented to PI Middle east Profibus.Profinet Seminar
Jeddah
Date: 25 September , 2012

Insight into water and wastewater SCADA implementation project Jeddah

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1) Understand how the SCADA system is used in day to day operations at NWC in Jeddah.

2) Understanding NWC's SCADA implementation process and the results in the control and the management of the O&M teams in the field.

3) Addressing the challenges' faced with the SCADA system for the water industry.

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A. Brief history :

City	Population	% of KSA population	Daily potable water supply (M3/day)	% of KSA total potable water supply	Status of privatization
Jeddah	3,068,485	12.29 %	626,173	12 %	**Finalized**

- Limited number of flow meters are used through out the network.
- Heavily relied on SWCC for bulk metering.
- No operation centre and basic data base and reporting mechanism.

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B. Daily operations:

- **SCADA system provided easiness of information flow into one place enabling us to keep and maintain operation data base.**
- **Reporting system in place to produce periodically.**
- **Communication Vocal point for operation activities & emergencies.**
- **24/7 monitoring of the network and spontaneous slips reporting.**
- **Control of bulk transmissions distribution of teams (future)***
- **Issuance of Maintenance requests**

Understand how the SCADA system is used in day to day operations at NWC in Jeddah.

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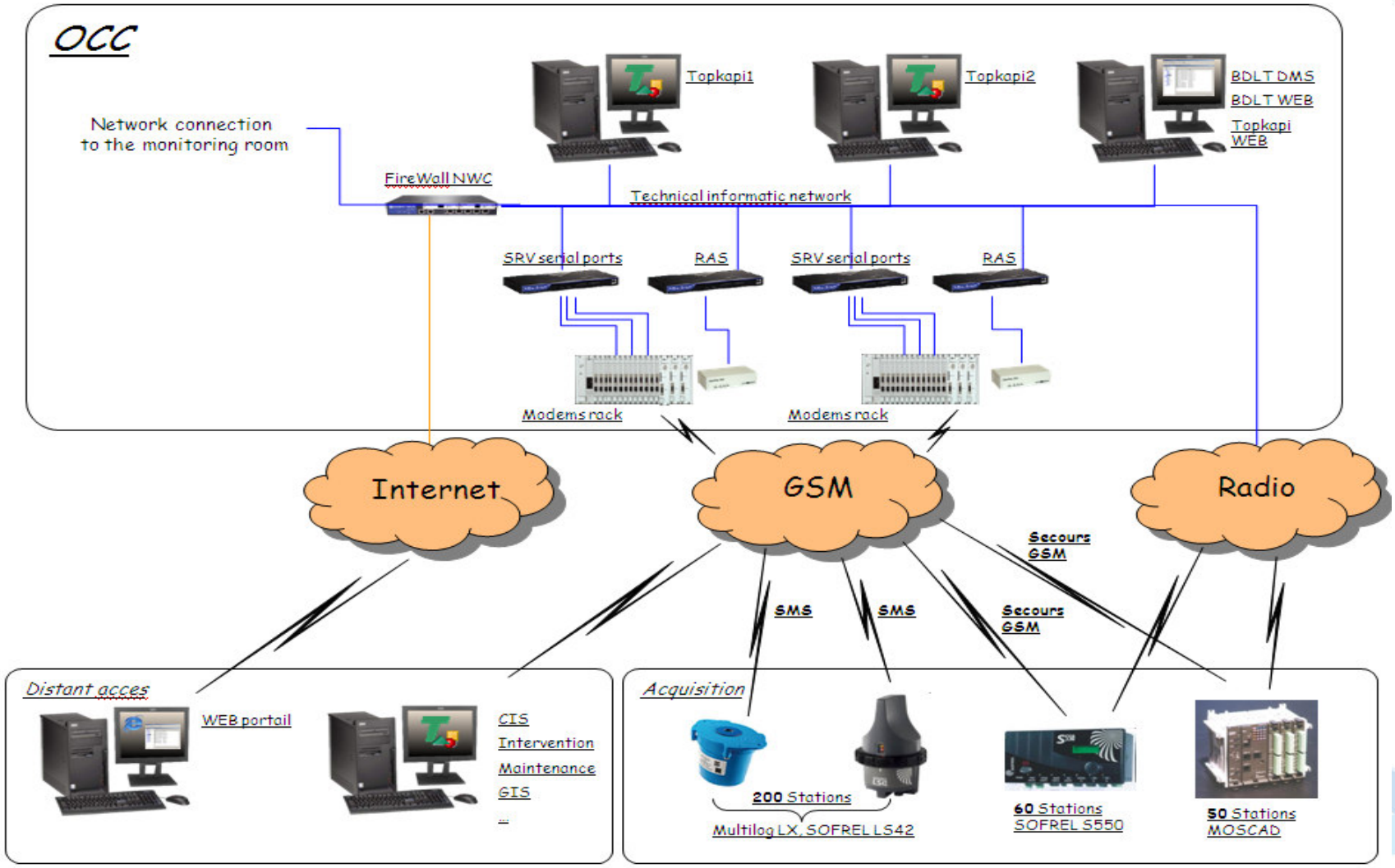
C.



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- All sites are represented on mimics. There are three levels of mimics developed

A map represents north and south zones of Jeddah

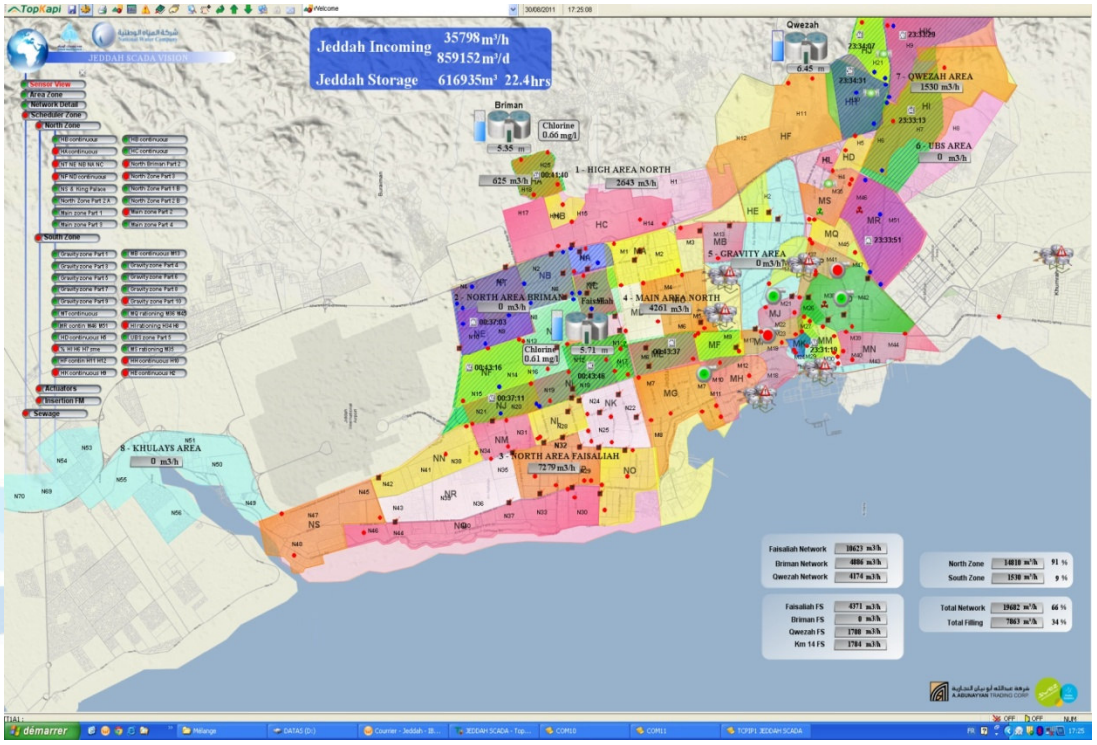
A dedicated layer represents the 7 water distribution areas. Each distribution area includes several supplied districts.

In addition to those sites, information hereafter are also display :

- Levels in reservoirs
- Cumulated volume for reservoirs
- level of chlorine
- total stored water in reservoirs
- Total flow in filling stations

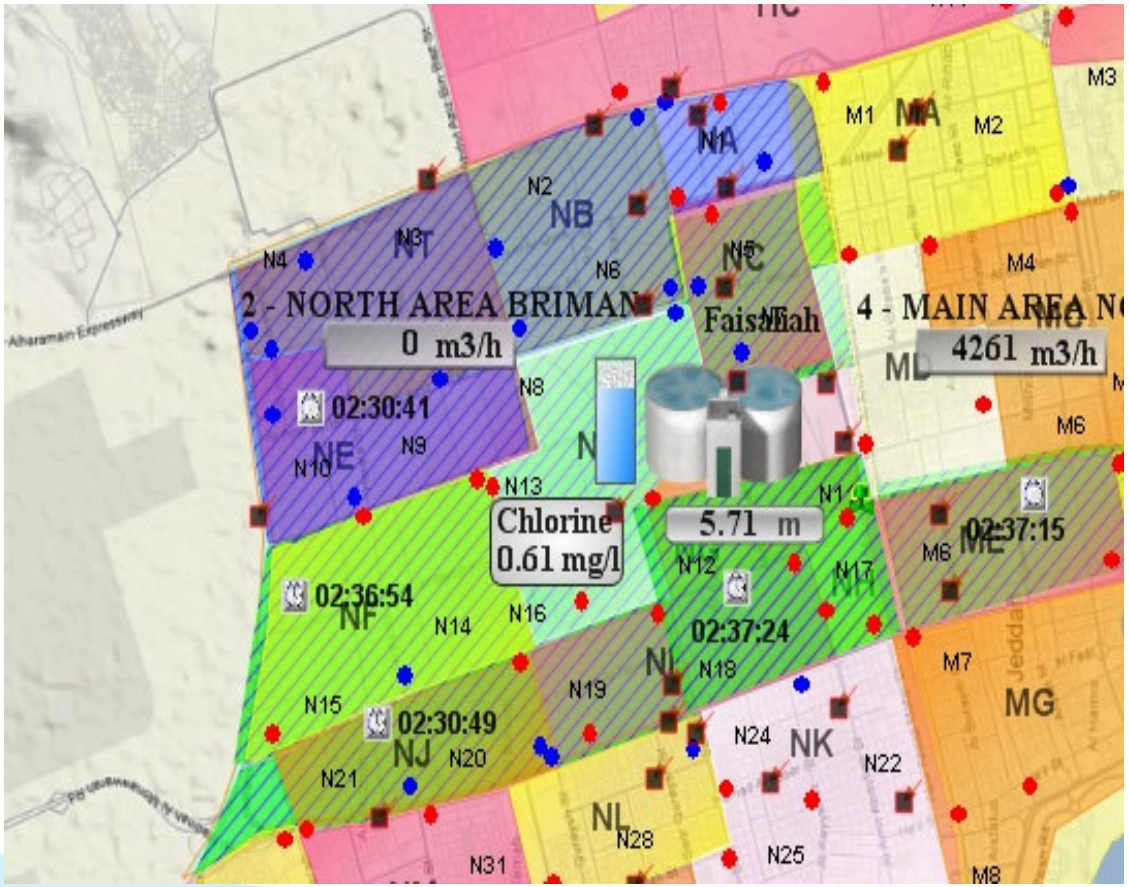
- You can select / unselect area to display

- All sites are represented



Mimic level 1 – Area Zone

- Hatched green area zone represent zone with active schedule and NOT water detection with the reference pressure sensor.
- Hatched blue area zone represent zone with active schedule and water detection with the reference pressure sensor.



Mimic level 1 – Sensors points

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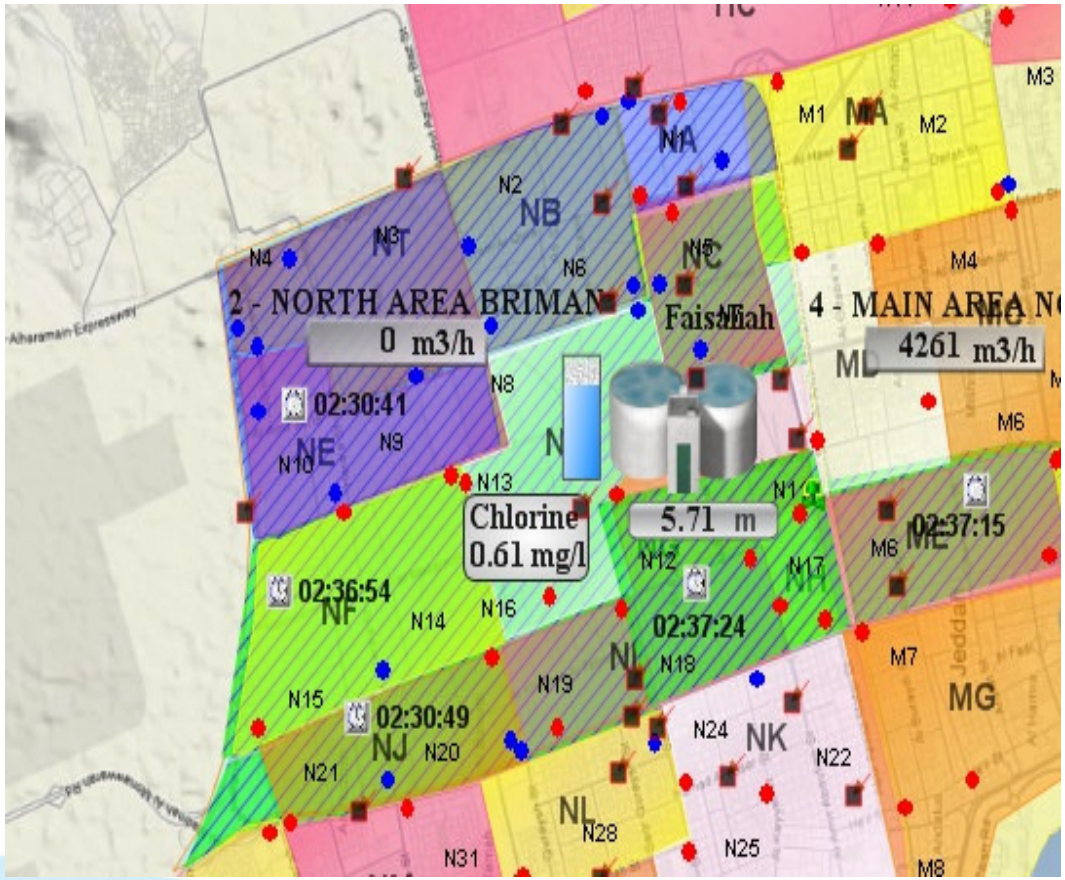
Red points represent sites where there is minimum one default/alarm on-going (circle for pressure points, squares for flow meters,…).

Blue points represent sites where water is detected (> 15.1 meters) and schedule is active for this area .

Blinking blue points represent sites where water is detected (> 15.1 meters) and schedule is NOT active for this area .



Mimic level 2 - Zone

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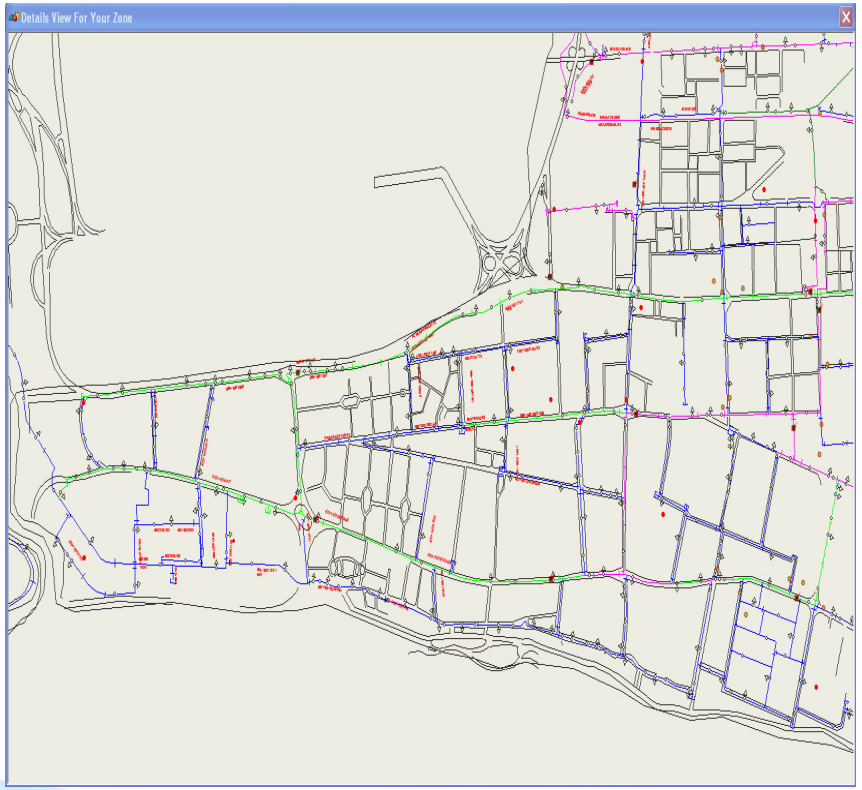
- Each mimic level 2 is displayed full screen by double clicking on the corresponding polygon on mimic level

- A dynamic dwg file corresponding to the same is displayed with the following layers appearing when the zoom level increases.



Mimic level 3 – Site information

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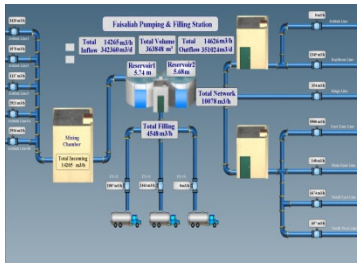
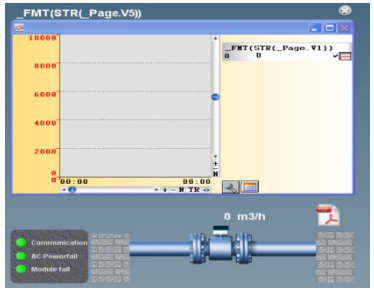
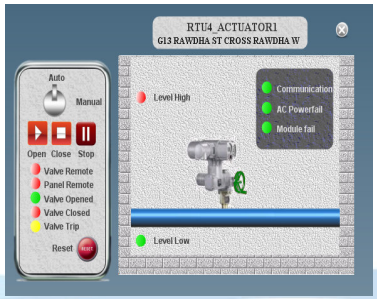
Each mimic level 3 is displayed full screen by double clicking on the corresponding icon on mimic level 1. Mimics level 3 are representing each type of site.

- Plant
- Flow meter
- Pressure logger
- Level sensor
- Actuator







Use of PROFIBUS in National Water Company

1. Qwizah Reservoir
2. Briman Reservoir
3. Fasyalyah Site
4. Wastewater main lifting stations
5. Wastewater treatment plants

all of the above are/will be communicated via Profibus DP and Profibus PA

Qwizah Reservoir

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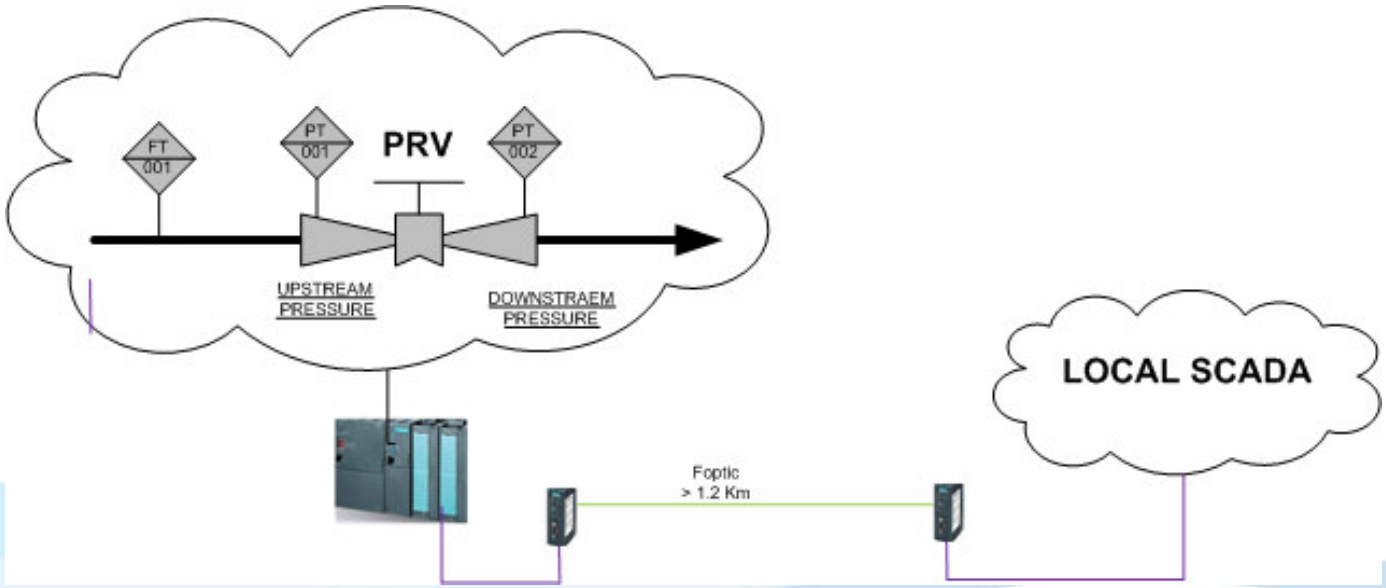
There are Siemens PLC that communicate via Profibus
For example, s7200, s7300 and TPs



Briman Reservoir

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There is on-going project that is to communicate all the local PLC via Profibus and then send the data to the RTU which will update the Main Operating Control Center (OCC) at Tahlyiah
We have selected the Profibus, because it is standard fieldbus protocol And Easy diagnostic and maintenance

Fasyalyah Site

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There is on-going project that is to automate the water treatment plant.
There is also, BMS burner management systems with related instruments.

We have agreed to have Profibus DP for the PLCs communications and Profibus PA for instruments communications.
 we will be using the flowing transmitters:
•pH meter
•Oxygen analyzer
•Flame detector and its ignition
•Flow meters
•Pressure transmitters
•Level transmitters
All will be communicated via Profibus PA

Wastewater main lifting stations

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Most of the main lifting station is communicating via Profibus
The communication is between the PLCs, VSDs and the
Related instruments and the expansion rack

There is an RTU in each MLS is to update the data via UHF to the OCC

Wastewater treatment plants

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Each treatment plants has own control system . The basic communication Protocol is the Profibus.

Some of the treatment plant is updating the data to OCC via UHF and the others Are updating the data via GPRS/3G

Benefit of using Profibus

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- Standard Field bus protocol
- Easy to manage and diagnostic
- Get more information from the instruments
- Reduce cabling
- Reliable and secure
- Having diagnostic tools

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شكراً لكم

THANK YOU