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TELE-CONTROL IN BULK WATER SYSTEM

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SUMMARY – Palestinian water managers, scientists and researchers are at very serious disadvantage as a result of having no access to water resources information and no control. Precise and accurate scientific data is absolutely fundamental to effective water resources management. The most recent water resources assessment available to Palestinian was performed before many years ago. Hydrometric network gathering water resources information has been carefully guarded as an exclusive Israeli asset and Palestinians have been unable to perform the field monitoring and establish the extensive longitudinal data records required. Correlatively, the depth of human skill base which derives from experience in practical control of water resources is absent. The target of using Tele-Control in Bulk Water System is to facilitate and improve maintenance and operation of the water projects in Palestine by Applying of the tele-control system in water supply networks, storage and pressure regulating reservoirs, wells and booster stations. Which will give us a better control of water losses, black losses, water leakage and the pressure zones where the consumer's services, quality of water and availability and reliability of supplying water will be improved for the Palestinian inhabitants. The System involves the full upgrading of the water supply and distribution system in Palestine, rehabilitation of the main water sources, replacement of the water distribution networks, constructing and refurbishment of the storage reservoirs and collecting the required information's data. This system is consist of electrical panels (Software and hardware), hydraulic equipments , radio communications, control room and technical staff to operate and maintain the above mentioned system which is also called SCADA System. Further, in PWA we think that technique is applied in many countries in the world, exactly in Italy which is considered as a pioneer in this field. So, in fulfilment of cooperation between Italy Government and Palestinian Water Authority (PWA), we hope to cooperate with your water institutions for all issues belongs the mentioned subject in order to gain the knowledge, experience and technical training course which are necessary for the installing, operating and managing of our SCADA System.

Keywords: technological resources to improve water management

1. INTRODUCTION

Palestinian water managers, scientists and researchers are at very serious disadvantage as a result of having no access to water resources information and no control. Precise and accurate scientific data is absolutely fundamental to effective water resources management. The most recent water resources assessment available to Palestinian was performed before many years ago. Hydrometric network gathering water resources information has been carefully guarded as an exclusive Israeli asset and Palestinians have been unable to perform the field monitoring and establish the extensive longitudinal data records required. Correlatively, the depth of human skill base which derives from experience in practical control of water resources is absent. Despite all difficulties including Political instability, the West Bank Water Department (WBWD) and the Palestinian Water Authority (PWA) is looking forward to deal with and adopt a good technique and new technology by applying of tele-control system in their water facilities, such as Remote Control and Monitoring System (SCADA).

2. SYSTEM'S OBJECT

The target of using this technology is to facilitate and improve maintenance and operation of the water projects in Palestine by applying of the tele-control system in water supply networks, storage and pressure regulating reservoirs, wells and booster stations. Which will give us a better control of water losses, black losses, water leakage and the pressure zones where the consumer's services,

quality of water and availability and reliability of supplying water will be improved for the Palestinian inhabitants.

3. SYSTEM'S FEATURES

1. Remotely control, monitoring and surveillance of WBWD's production and distribution sites.
2. Immediate transmission of relevant functional and Security events via Visual and audio means e.g. voice massages, e-mail and SMS.
3. Store all system data and other operational variables in database for analysis, review and simulation.

4. SYSTEM'S OUTLINES

The System involves the full upgrading of the water supply and distribution system in Palestine, rehabilitation of the main water sources, replacement of the water distribution networks, constructing and refurbishment of the storage reservoirs and installation of a tele-control system.

The system is consist of electrical panels (Software and hardware), hydraulic equipments, radio communications, control room and technical Staff to operate and maintain the above mentioned system which is also called SCADA System.

In order to operate and manage the PWA water projects according to SCADA System, it is necessary to check and prepare the following:

1. collect all the accurate technical information belongs the existing water projects in Palestine and determine the purposes and the importance of these projects by analyzing of these information.
2. discuss the situation of the existing water projects according to its age, the benefit and the continuity of the projects.
3. clarify the nature of developing for the existing water projects and the visibility studies for the future water projects.
4. select appropriate technical and economical policy for the proposed project.
5. design the proposed water project and applying of tele-control system on the water projects in Palestine by installing of SCADA System.

So, tele-control systems involve the knowledge of many disciplines. First of all we have to know the basics of the process under control (in this case the hydraulic system). We need also some knowledge a bout the electronic and electro-mechanic devices which used as transducers and actuators. For the automatic control of some devices, such as regulation valves it is important to have a basic knowledge of systems theory. Remote control is performed by using PLCs (Programmable Logic Controllers) or similar devices, so it is required a gain some knowledge in electronics, electrotechnic and programming.

Data transmission is usually done by using radio links or telephone cable (copper cables or fiber – optics) for this part of the tele-control systems, some knowledge about telecommunication system is required.

Finally, some knowledge about the computer networks is required for the control room.

5. SYSTEM'S ADVANTAGES

There are many advantages for the using of tele-control and monitoring system in the PWA Water Project such as:

1. Increase the efficiency and cost effectiveness of supply and distribution of water.
2. Contribute to efforts to reduce unaccounted water and water spillage.
3. Encourage efficient utilization of human resources.
4. Enhance the decision making and management information processes.

6. OBSTACLES

The successful implementation of the remote control and monitoring system in the Palestinian water facilities will face many obstacles and difficulties during all stages of planning, installing and operating as follows:

1. Restrictions which are imposed to the Palestinian National Institutions by Israeli Occupation to prevent the developing and the using of any modern technique.
2. It is very difficult to get a permit from Israeli Government for the executing of the components of the system.
3. The water resources is still being under the control of Israeli Side and the quantity of water supply to the Palestinian Local Communities is Limited.
4. Technical problem's in installing and operating the telecommunication Systems, computer networks and the hydraulic devices such as the deliberately interruption and disturbance for these sensitive instruments by the occupied forces and the Jewish Settlers.
5. For Palestinian Local Communities in the West Bank area, the water services are closed and connected directly with Israeli Water Company (Mekorot). For this case, it is difficult to separate their water system from the above-mentioned system.
6. Finical obstacles are the main problem for the implementation of SCADA system such as it is for the other infrastructure projects in Palestine.

7. PROSPECTS

The Palestinian Water Authority and West Bank Water Department are in a stage of capacity building (Including human resources development) and naturally promotes the opportunities of its technical staff to improve their qualifications as in the end this improvement will be positively reflected on the implementation, development and maintaining of water projects in Palestine.

Further, we think that technique is applied in many countries in the world, exactly in Italy which is considered as a pioneer in this field. So, in fulfilment of cooperation between Italy Government and Palestinian Water Authority, we hope to cooperate with the Italia water institutions for all issues belongs the mentioned subject such as the knowledge, experience, technical training course and financial supporting in order to install, operate and manage our SCADA System.