National Water Carrier Uses Motorola's MOSCAD

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In many parts of the world, water is not plentiful. However, since it is a necessity for life, every effort is made to ensure availability and keep its cost as low as possible. A remote control system, such as Motorola's MOSCAD,is designed to keep the cost of water within the reach of all, without sacrificing quality and ensuring the desired quantity.

Operational Savings

A control system will ensure operation of the system's pumps during hours of low energy rates. It will only do essential running, for the least amount of time, during peak hours to save costs. Minimal control center personnel can run the system and monitor maintenance requirements of the entire system, including the pumps and electrical panels in the stations. Burst pipes, pump problems and reservoir overflow are immediately located and repaired by mobile maintenance crews. The prompt repair of a problem has been shown to significantly reduce maintenance costs.

System Reliability

A computerized control center not only ensures proper treatment and supply of the water, but it also ensures that the consumers are guaranteed a steady supply. Here too, by careful monitoring, any problem can be instantly identified and located by the system and repaired by the maintenance crews that are instantly dispatched to the site.

Control System

The control system is hierarchial and is divided into three levels: control center, subcenters and field units. Each level has its own configuration and responsibility. Hierarchial design lends itself to redundancy so that if there is a failure in the control center, the system will continue to function. Other levels in the system take over and continue operation of the water system in the most optimal manner possible.

Control Center

Configuration

The control center is composed of an FIU MOSCAD connected to the field units by radio and wire and to a personal computer by FRONT END software through RS232. The software handles communication with the field units and transfers data from the DECNET to a VAX computer. SCADA software, running in the VAX, displays the data graphically to the operators.

Responsibility

- Displays concentrated field data to the operators
- Analyzes data and warns of unusual values
- Runs software to automatically check proper functioning of units and to send new parameters for optimum operating efficiency of water system equipment
- Sends operation commands and parameters to the field, at operator's discretion
- Displays reports and graphs of required statistical information

Subcenters

Configuration

Subcenters consist of a MOSCAD connected to the control center by radio and by wire and to an additional MOSCAD, which communicates with the RTU (Remote Terminal Units) field units, also by radio and by wire.

Functions

- Connects the remote control center to the field units that are in close by
- Operates the field units automatically and centrally. It will also act independently from the main control center according to data received from the field units and operating parameters received from the control center

RTUs

Configuration

The RTUs are installed in pumps, storage tanks, valves, etc. They have a MOSCAD connected to the subscenter by radio or by wire. The unit has I/O cards for receiving data from the sensors. In the newer stations, data is received by communication between Programmable Logic Controllers (PLCs), the MOSCAD and the electric panel controller.

Functions

- Gathers, processes and transmits field data to the control center
- Operates pumps according to requirements of the control center and subcenter
- Operates pumps locally and automatically according to operational parameters and requirements of the control center

Future Development Plans

Control Center

- Improve the quality of the data arriving from the field
- Run comprehensive supervisory software for total operation of the control center so that operator can focus on the more important operating problems
- More extensive and detailed display for managers and water, electrical and mechanical engineers, etc.

Field Units

- Improve communication capability between the units by developing more sophisticated radio systems protocols
- Increase MOSCAD data receiving and processing capability
- Expand MOSCAD communication capability with electrical panels

The future will see a growing dependence on water supply systems because of increasing population, industrial development and weather changes. We MUST continue to develop control systems to meet this challenge.

Motorola stands in the forefront of companies constantly seeking improvement in control systems for water supply.