[Schneider Electric Case Study]

Florida Keys Reap Benefits of New Control System for Water Treatment

New system improves reliability, energy efficiency and allows remote monitoring

In 2006, the Florida Keys Aqueduct Authority (FKAA) developed a strategic master plan and 20-year water system capital improvement program (CIP) to address increasing water demands from population growth, as well as more stringent environmental protection and regulatory requirements. The CIP identifies short- and long-term improvements to water transmission, distribution, water storage, raw water supply and water treatment plants. The upgrades increase water treatment and storage capacities, and improve flows and pressures to meet anticipated water demands. Ultimately, the CIP changes will improve the reliability and quality of the FKAA's drinking water, and meet regulatory standards and projected water demands.

As part of its CIP planning, FKAA personnel met with Schneider Electric, one of the world's leading suppliers of power, control and automation solutions, about standardizing its control system communication platform. The FKAA utilized Schneider Electric's Lifebook planning tool. Lifebook is an analysis tool that gives customers a facility-wide view of their automation system and helps them determine a long-term strategy for their automation infrastructure. The results give customers the basis for evaluating and prioritizing change.

Through the Lifebook process, the FKAA embarked on an automation system migration to replace 20-year-old equipment that was out of date, expensive and difficult to maintain. One of the other main drivers for the upgrade was to expand the capabilities of the control system. The FKAA wanted to move to a common communication platform, a common programming language and implement remote monitoring capabilities.

The FKAA facilities extend over a 130-mile range on 800 islands. Dispatching service technicians when there's a potential problem is time consuming and costly. Therefore, the authority wanted to establish control and monitoring access of every unit, from

large water treatment facilities to small boost pump stations, via one Ethernet connection. Remote monitoring capability also allows FKAA employees to bring the facilities back on line in the event of a hurricane or other natural disaster.

New Automation System

Schneider Electric's Automation Services team undertook the project with FKAA staff, migrating 36 stations from their existing control system to new automation hardware and software utilizing the same programming language. Using Schneider Electric's Unity™ Pro development software reduced the FKAA's development costs and will reduce downtime across the application's entire lifecycle, from design to maintenance. The single software package also allows on-line updates and simulation.

All of the equipment, including Schneider Electric Modicon® Quantum™ and M340™ programmable logic controllers (PLCs) and Magelis® human machine interfaces (HMIs), is outfitted with Schneider Electric proprietary technology that allows it to communicate on a secure Ethernet connection. The common Ethernet communications platform also enables FKAA staff to remotely access the equipment via a secure Ethernet connection from anywhere in the world to make software and control changes. Schneider Electric also updated the telemetry system, which monitors things like water flow, pressure and pH balance, with new PLCs.

Energy Savings and Remote Monitoring Benefits

The new equipment has been a huge boon for the FKAA, improving the water system's reliability and energy efficiency, and offering remote monitoring capabilities.

The new control system gives the FKAA information they didn't have before, such as their current water level. Based on this data, the FKAA can make more informed decisions about how much water to pump. Prior to the new system, the authority would run its pump systems at full capacity because it wasn't sure how much water was needed — a common practice, but one that's neither resource nor energy efficient. Now, FKAA staff can make decisions based on their actual water level and can better plan and predict to meet the water need, greatly reducing energy consumption and waste.

The greatest benefit to the FKAA, though, has been the ability to communicate remotely with the PLCs.

"Prior to the upgrade we had to travel to each and every PLC, covering over 130 miles. Just the transportation and overtime costs to send a technician to one site was huge," said Carl Brewster, Chief Information Officer, FKAA. "We are more efficient now because we've eliminated any need to travel to any PLC for troubleshooting. Our technicians can identify the problem remotely and then take any needed equipment with them instead of having to make 3-4 trips for troubleshooting and then repair."

The FKAA also installed new water meters that monitor a customers' water consumption at the account level. Once the control system is interfaced with the meters, it will be able to identify and alert FKAA operators about water problem, such as a water leak, through programmed alarms. In turn, the FKAA can proactively contact customers who may not even be aware they have a problem.

The control system upgrade has laid the foundation for the future and simplified service and maintenance for customers. From the perspective of Florida Keys' residents and visitors, the FKAA's objective is for the water supply to be simply, "business as usual."

For more information, visit www.schneider-electric.us.

Schneider Electric USA, Inc.

8001 Knightdale Boulevard
Knightdale, NC 27545 USA
Tel: 919-266-3671
www.schneider-electric.us

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