Case Study | Royal Palm Beach, Florida

Tapping into SCADA technology

How one Florida utility is benefiting from a state-of-the-art management tool.

The management of wastewater transmission has improved significantly in recent years with advancements in PC's and other technologies. Supervisory Control & Data Acquisition (SCADA) ranks among the more noteworthy of these tools to reach the field of public works.

With telemetry, hardware and software elements of SCADA, proven by years of successful installations in large cities, scores of smaller municipalities are now investing in the technology. Some use it mainly for heightened safeguard against overflows and to gain centralized electronic control.

Utilized as a broader management tool, however, SCADA also can reduce staff overtime, help in preventive maintenance scheduling and enhance the operational cost efficiencies of a utility.

These were the types of incentives that led The Village of Royal Palm Beach, Florida to recently invest in a technologically advanced MultiTrode® Outpost SCADA system.

"We viewed the addition of SCADA less on the basis of the initial costs than as a natural progression for any modern utility", states Paul Webster, Director of Utilities and a 14-year veteran of the civil engineering field. *"Our goals are to steadily increase the reliability of our operations by incorporating appropriate technologies".*

The Multitrode Outpost system reduces dependence on system integrators because it comes preconfigured with built-in expansion capabilities via pop-up screens. The central monitoring station works in tandem with field hardware units that consist of a pump controller and monitoring units. These deliver full condition monitoring of the pumps and electrical supply system that enables remote diagnostics of multiple alarms. Site responses are often eliminated by remotely resetting the units at a station. The broad range of other information proves equally useful in programming preventive maintenance. It's these capabilities that distinguish the advanced system from predecessor technologies.

Comprehensive Data and Control

MultiTrode's sophisticated system is an off-the-shelf pump station management package that provides all the data required to remotely manage lift stations—without the complexities of some New Emergency Response Protocols.

Over the years, The Village's eight-man field force has had to juggle new construction and meter installations with emergency response to alarms at the various lift stations, along with associated maintenance and regularly scheduled on-site inspections. The previous protocol relied on a basic horn/flashing light alarm system at the stations. Reports from the neighboring public were fielded during off-hours by an answering service that paged the assigned field worker.

He would have no recourse but to respond blindly to the site in order to first determine the cause. That job, though, is about to become a lot easier with the scope of information, remote troubleshooting and centralized electronic control delivered by the MultiTrode system, which was recommended by E. K. Phelps & Company, a trusted pump supplier to the utility.

Improvements are already evident over the often inadequate telemetry system that the village had tested at four of the most critical stations during a pilot program. According to another department spokesman, the immediate results are improved efficiency and better utilization of a limited workforce.

Time and Resources

"We had personnel spending hour after hour at lift stations trying to visually determine the root cause of a failure when they could have been better utilized elsewhere," says Dan Scantland, Utilities Projects Coordinator. *"The old alarm system only told us whether or not a station was working, but not why it failed".*

"We had no two-way capability for diagnostics or restoration. We have gained that and much more, but haven't even fully utilized all of the capabilities of the SCADA," notes Scantland, who personally established the telemetry paths using a handheld Garmin GPS 5 unit. *"After the initial round of connections, we brought one or two stations online weekly. Thus far, the system seems to present a rather fast learning curve which is important to successfully implementing new technology."*

Dan Scantland personally established the new SCADA's telemetry paths; he likes the system's simplicity and ability to supply a wide range of data.

The data from the operational archive kept on each station provides a tool for preventive maintenance. Nearly 300 points of site information are retrievable by the software package that continuously takes the pulse of the lift stations and enables workers to remotely diagnose and control them from a Central Station.

Now, instead of driving out to a lift station, the field force can remotely reset a motor and analyze the cause of failures from the Central Monitoring Station. The worker on call during off-hours uses a laptop computer to access the SCADA for identifying and troubleshooting a problem.

In addition to the evident improvements in monitoring, remote diagnostics and electronic control over the lift stations at Royal Palm Beach, the system also stores a broad range of data on pump flow, start/stop frequency, thermal trips, run duration and electrical resistance. These can forewarn of impending problems with motors, electrical supply or potential blockages that serve as the basis for proactive maintenance for motor windings, seals or electrical supply systems.

How It Works

The architecture for the MultiTrode "Outpost" system consists of a (CMF) Central Monitoring Facility equipped with a 1-GHz PC, with an Intel Pentium 4 processor, 256 Mb RAM, Windows 2000 operating system, and a 19" color monitor to display a broad range of screens, and various related accessories.

The software generates comprehensive reports. The more critical stations can be grouped or placed in a priority set for more frequent polling and scrutiny.

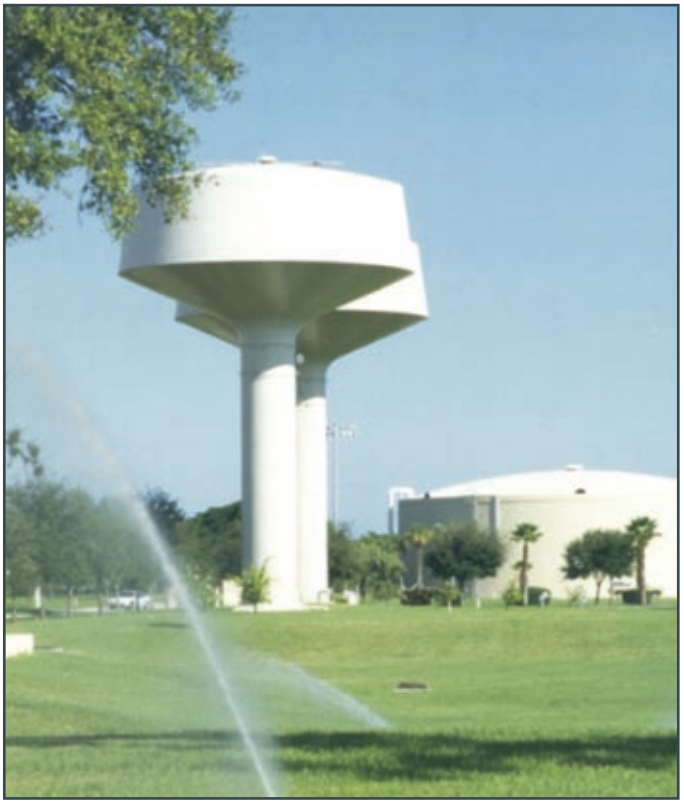
A 24-hour fault notification feature will ultimately replace the off-hour answering service.

To learn more about the MultiTrode system, log on to **www.flygtus.com**.

Beyond Expectations

"We've already used it effectively during power outages caused by lightning," Scantland recalls. *"We were here one afternoon when a particularly big thunderstorm rolled through and caused power outage across a section of the city. We could clearly see which lift stations were affected on the SCADA display screen. We have on-site generators at the two largest lift stations but use 12 portables for outages at the rest. The battery back-ups kept real-time assessments coming in to us so we knew how and when to respond. The system will help us a lot in these situations and during hurricane season."*

"Another big advantage is our ability to control lift stations that piggyback into a master lift station," he adds. *"We can monitor and control the flows remotely, even shut them down and use the combined storage capacity of the wet wells and lines. This will really help manage the flow when we encounter a problem in the system. It may take at least a half-hour to get a technician on site while the upstream stations would otherwise still be pumping and compounding the problem. That can now be avoided."*



Energy costs should also decline due to the utility's ability to use SCADA information to equalize or stagger flows and harness the inherent storage capacity of the collection lines to benefit from off-peak pumping to the treatment plant.

The workforce now has the ability to pulse-start pumps, apply varied fluid levels at times of peak load and even hold out stations. A field unit that incorporates level indication for a full range of fluid levels also reduces the need to open wet wells during inspection itineraries.

This Florida utility was looking for a State-of-the-art management tool. With their new wireless MultiTrode Outpost SCADA, it looks as though they found it.

When Power Goes Out?

At MultiTrode installations around the world, main computers are normally equipped with uninterruptible power supplies (UPS). If a power outage were to occur at a public utility using a MultiTrode system, operators would still be able to monitor lift stations. While water levels would continue rising, vactor trucks could be dispatched to key lift stations to pump their levels down, thereby alleviating the danger of spills. The excess water buildup at lift stations could be safely delivered to holding tanks at their respective treatment plants.

Edited by Jane Alexander Pumps and Systems Magazine

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