# SCADA for certainty

**By John J. Cronley**

*In today's world of increasingly complex technology, two very different utilities with very different issues came to similar solutions regarding their telemetry needs. A quickly deployed and easy-to-use SCADA system is adaptable to a variety of problems commonly faced by modern water and wastewater operators.*

## Bluegrass State sewer and water departments adopt new telemetry solutions

### Frankfort Sewer Department

Bob Peterson is the deputy director of collections for the Frankfort, Ky., Sewer Department. A few years ago, the Frankfort system began a systematic evaluation of its existing collection system. Early in the evaluation process, it became clear to Peterson that the existing telemetry system, which consisted primarily of aging dialers, was not trustworthy; he described it as "unreliable and costly."

A 15-minute lag time was typical between an event (e.g., a high wet well or power failure) and notification of a responsible party. Some stations did not have land-based phone lines available and instead relied on audible and visual systems that required a concerned citizen to notice and report the incident alarm. Those reported events were not verified easily and required the sewer department to dispatch an employee each time an incident was called in to the switchboard.

Frankfort's first step was to establish the framework that would be used to evaluate proposed solutions to its telemetry issues. After much discussion and analysis, the system managers agreed that the primary criteria of reliability, cost and functionality would be considered. During the initial stage of the project, several potential technologies were analyzed and evaluated.

Peterson's team first considered traditional licensed, radio-based SCADA as a solution to the problems. They quickly came to the conclusion that, because Frankfort is a hilly area and most radio requires a clear "line of sight" for reliable communication, several repeaters would be needed, substantially increasing the overall project budget. Peterson's initial budget estimates, based on submittals from prospective SCADA contractors, came in at "around $150,000 for the base radio station and about $25,000 per lift station," he said. The advantage of the radio-based SCADA solution was its perceived reliability and low ongoing fees, but the high cost of initial acquisition was a negative. Peterson also was surprised at the high cost projected for ongoing maintenance costs.

Frankfort briefly considered satellite-based communication systems as a potential solution, but the initial cost estimates and pricing structure posed issues; when team members checked with existing users, they found the reliability to be less than expected from other, lower-cost solutions.

Frankfort was introduced to cellular-based SCADA by Dave Ross, the Mission Communications representative for eastern Kentucky. Skeptical at first, Peterson is now an advocate of data cellular-based SCADA.

"Cellular gives us the ability to go anywhere," Peterson said. "Of all the options we considered, the Mission system offered the most reports and usable data at the lowest cost. Their ongoing price structure for both service and replacement parts was better than the competition, and the upfront cost was the lowest of any

option we evaluated. The best thing about Mission is that several times it has saved us countless amounts of money by alerting us to a problem, such as bad floats or excess pump starts, before it becomes a more serious problem. … We are currently deploying Mission SCADA for our flood station control systems, and we are evaluating [it] as a potential solution to our SSO [sanitary sewer overflow] issues."

### Ashland Water Department

Ryan Eastwood came to the Ashland, Ky., Water Department in June 2009 as the director of engineering and utilities. One of his first projects was to get a handle on the efficiency issues plaguing the department's existing water delivery system. Although Ashland had a SCADA system, much of that system was unusable, according to Eastwood. The high cost of servicing the system had forced the department to allow many parts to go dark rather than increase maintenance budgets to the point that would be required to keep the network operating.

"The equipment we had required a lot of service," Eastwood said. "Every time our SCADA contractor came out to work on the system it cost us a minimum of $1,000 for travel and another several thousand for the service. We were forced to resort to 'dinosaur' techniques of driving around and checking each station individually."

This combination of high cost and unreliable equipment made it difficult to use the existing telemetry to gather the data necessary to identify, diagnose and repair the system.

"When I started with Ashland, over half our existing SCADA system wasn't working," Eastwood said. "We were trying to evaluate our system loss but had no real way to gather accurate data. Our existing computers were becoming obsolete, and our software was out of date. The initial audits of our system indicated that we were experiencing a loss of 30% to 40%. From a financial point of view, I had a great reason—and a goal—to reduce system loss."

Eastwood began looking for a new easy-to-use and easy-to-maintain SCADA system. "Around that same time, our supervisor of water met Dave Ross at a conference. [Ross] came to Ashland and did a presentation covering costs, ease of installation and explained the cellular-based system. … When he offered to install a unit for side-by-side comparison to the competition, it was a pretty easy decision. We purchased and installed two units at our worst sites."

The test went well. The water department was impressed not only with the amount of usable data it was able to obtain easily from the unit, but with the reliability of the cellular network. Ashland now uses the tank and well control package to operate the pumps at the well and to keep its tanks at an optimum level. Over the course of several months, Eastwood and his



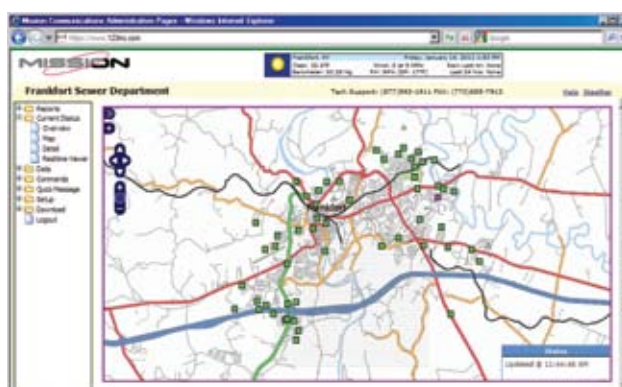**Ashland's new SCADA system is easy to use and maintain.**
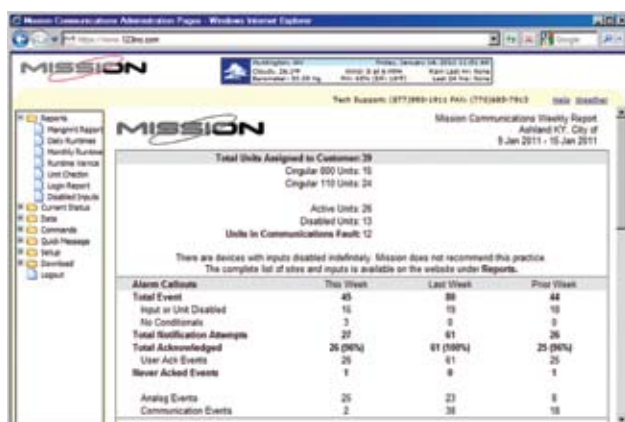


**The new system has enabled lower budget and operating costs.**
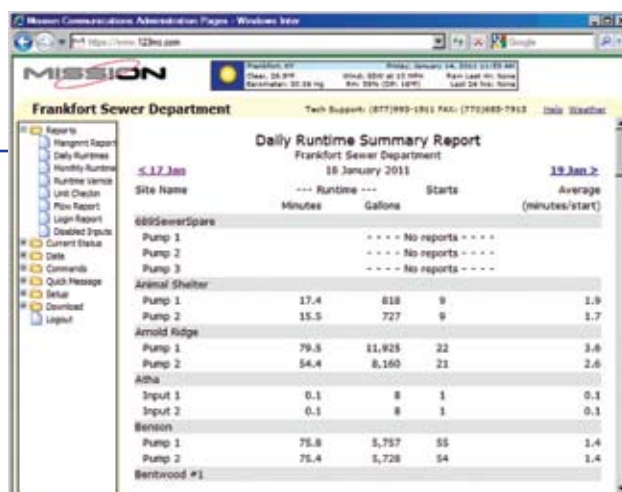
The new SCADA system offered Frankfort the most reports and data at the best price, said the deputy director of collections.



SCADA is deployed at Frankfort for the city's flood station control systems.



Cellular SCADA gives Frankfort the ability to go anywhere.



Frankfort is considering Mission as a solution to its sanitary sewer overflow issues.

team were able to reduce the system loss by more than 1 million gal of treated water per day.

"The staff was amazed to see daily production demand drop to levels that they hadn't seen since 2006," Eastwood said. Overall budget and operating costs, too, are down dramatically since the SCADA solution was implemented.

The city's system had a minimum of five tanks that consistently were over-filling and subsequently spilling water. Those tanks were in remote areas and not affecting the surrounding population enough that the spills were noticed easily, so the water authority seldom was notified when a spill occurred. Prior to the installation of the cellular SCADA, the water department visited each pump station an average of two times a day; after the installation of the SCADA, staff visits about once every other day as is required.

Eastwood also added that the accurate alarms have helped the department reduce overtime dramatically. Because the alarm messages staff members receive have detailed information, and because they can access their station data from any computer or smartphone, they are better able to prioritize and thus spend less time driving and more time working.

"Our city engineer is using data directly out of the Mission system for his own modeling," Eastwood said. "It helps that all the runtime and flow data is already in Excel format and available for quick download."

Eastwood currently is evaluating adding telemetry equipment to Ashland's master meters, which he plans to interface to the Mission unit using a 4- to 20-mA output signal. The department also is considering the Mission M-80 self-contained unit to track manhole surcharges and overflows, which have been hot issues for state regulators in recent years.

"Overall, we are very happy with our choice for SCADA," Eastwood said. "It is a convenience to be able to see what is going on with our pump stations from wherever I'm working. I can even turn pumps off or on from my smartphone if I see a problem starting to develop." WWD

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