

## Water Remote Telemetry SCADA



*Reliability and scalability are design requirements for state-of-the-art water systems from Tetragenics, of Butte, Montana.*

The City of Shelby, Montana is faced with many of the same water problems as other US cities; aging equipment, unreliable performance, and a requirement to produce the increasing number of reports required by the Government.

Tetragenics Company of Butte, Montana installed a telemetry system for the City of Shelby. The state-of-the-art equipment maintains water levels and alerts City of Shelby workers to any power failures or other problems at the city's water well site near the Marias River.

The system provides pump protection and pump rotation while keeping water storage tanks full. It uses off-the-shelf computer controls to monitor the depth of the water storage tanks and detect any problems or failures with the water system.

"This new equipment will eliminate the need for us to keep running back and forth to the river to see if the pumps are working," said Bill Moritz, a city foreman in charge of the water system.

The system will automatically shut down equipment and alert the operator at Shelby's city shop if anything goes wrong at the water well site," said Chad Carpenter, Tetragenics Project Manager. "Eventually, if the city is required to report distribution figures to the state electronically. With this new system, they can hook their system to a personal computer to log data and produce the necessary reports."

Government regulations are forcing municipalities to add or upgrade technology used in their water systems. "Government regulations will make this type of system more standard. The system we installed is state-of-the-art and offers capabilities for future expansion," said Carpenter. "A water automation system can also be used in water treatment, waste water, and water distribution applications."

Although residents will not notice any difference in the water running out of their taps, Moritz said the installation of the Shelby telemetry system means that

all the water well pumps will not have to run at the same time, as they did before.

Before the new system, an operator would have to drive to the sites daily to turn them on in the morning and off in the evening. Although the number of pumps running will decrease, there will be no effect on residents' water pressure.

"This will save in energy costs," he said. "It will also keep our storage tanks full constantly. More and more government regulations are being imposed on water systems, and this system will enable use to keep up with those requirements."

Chad Carpenter, left of Tetragenics, and Bill Moritz, a city foreman in charge of the water system, stand in front of the new computerized control panel. Photo by Cindy L. Combs..

## The Situation

The City of Shelby Water department needed help. Their existing control system was old and malfunctioning. The City's crew had to manually maintain the water level in their main 1.5 million gallon storage tank. Operators had to travel to the well field that supplied the main tank and turn the pumps on and off daily.

If the level transducer broke down, the main tank would overflow and they would lose water. And the Government was issuing regulations forcing municipalities to automate their systems.

The City of Shelby and Tetragenics got together and came up with a solution.

## The Solution

Tetragenics programmed and installed telemetry equipment to control the Shelby water system and to allow operators to set and view parameters as required.

## Simplified Description

The system monitors the water levels in the main storage tank and maintains a minimum level. The tank supplies residents with water. If the level changes, the system automatically adjusts the water flow coming from eight remote well house pumps.

The system is optimized so that not all the water well pumps have to run at the same time. This saves energy costs. Also, the remote sites can be controlled from the main City Shop.

## Details

For the project, Tetragenics installed an Opto 22 G4LC32 Controller (Master), at the Shelby City Shop. Programmed in Opto 22's self-documenting, flowchart language OptoControl, the Master includes a display and keypad for operators to set alarm points, specify set points, and view the status of various points in the system.

Radios connect the Master and the main tank to the well field. The Master reads the analog level and compares it with flexible limits to determine which pump(s) to turn on or off. It continuously outputs the levels to a chart recorder.

Opto 22 B100 intelligent brain boards are installed at the well field. The Master communicates with these remote brain boards for automatic pump control. The new system interfaces with original control modules to show pump run, fail, and call conditions.

The Tetragenics system gives the City of Shelby;

- better control of their water system,
- an efficient automation system,
- room for future expansion,
- lower energy costs, and
- the ability to meet government regulations.

Plus, they get all of these benefits while saving money, and without having to drive to the well field.

