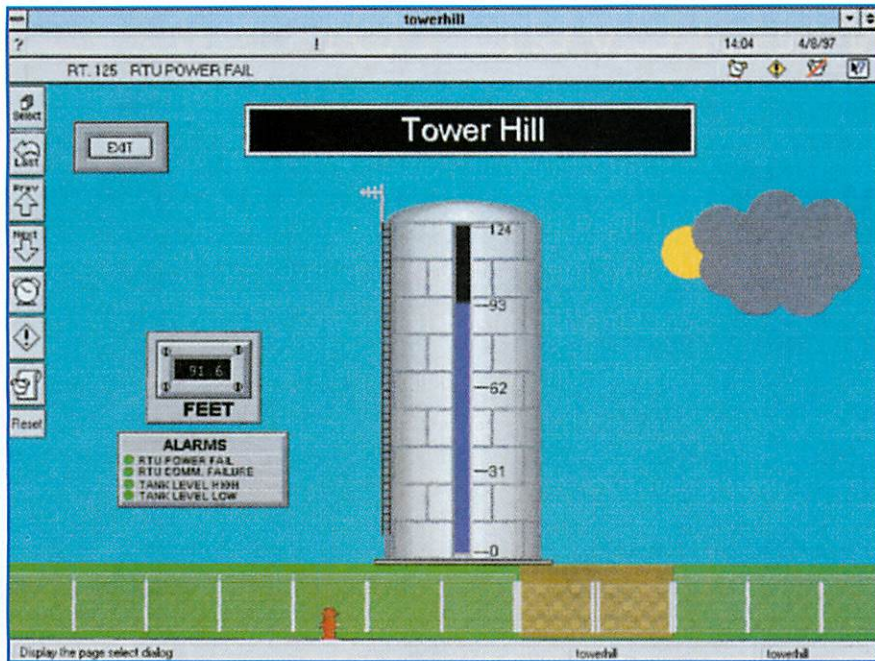


Software Quenches Water Department's Thirst for Data



In 1994, the North Reading Water Department, located 15 miles north of Boston, was struggling to comply with increasingly complex government regulations while using a piecemeal control system. Furthermore, during the summer months, the town was forced to purchase water from a neighboring community to make up a nearly 1.5 million-gal. shortfall each month. According to the water superintendent, Mark Clark, obviously something needed to be done to upgrade the aging facility's control system.

"The facility ran on an old telemetry control system that only provided basic on and off control," says Clark. "We wanted to gain better control over the system—without staffing the facility 24 hours a day—to maximize water production and minimize the amount of water we purchase from outside."

Because North Reading draws water from six wells in a tightly regulated river basin, it must purchase additional water from the adjacent town of Andover when it draws more water than allowed by state regulations from the highly stressed Ipswich River watershed.

For Clark, the solution to this problem came in the form of a PC-based control system using Citect SCADA (supervisory control and data acquisition) software which was installed last year with radio modems for remote monitoring. The Citect SCADA system, housed in the

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main plant, includes remote monitoring of well levels and control of pumps; monitoring of flows, tank levels, and pressures in two storage tanks and in pipes throughout the town; chlorination, fluoridation, and addition of potassium hydroxide for control of pH and corrosion; and automatic backwashing of the system's three main water filters.

With the combined power of a Windows-based SCADA system and inexpensive radio data modems, it is now possible for the department to view the status of the entire system instantaneously and to avoid unnecessary purchases of expensive water.

Problem:

To comply with increasingly complex government regulations that forced the North Reading plant to purchase water from a neighboring community, the Water Department decided to replace its antiquated control system.

Solution:

A PC-based control system using SCADA (supervisory control and data acquisition software).

Payoff:

With the combined power of a Windows-based SCADA system and inexpensive radio data modems, it is now possible for the department to view the status of the entire system instantaneously and to avoid unnecessary purchases of expensive water.

Out of an annual budget of \$460,000 for water purchase, North Reading conservatively expects it will save \$100,000 annually from this improved efficiency. In July of 1997 alone, the town saved \$18,000—far more than expected.

Another savings that the district expects from automation—one that may never show up on the bottom line—is being able to continue to operate without staff on duty 24 hours a day. At present, the water treatment plant operator can use a dial-up modem and laptop PC to check the status of any equipment anywhere in the system and change setpoints, pump status, and other parameters without having to come on site. In addition, the improved data collection made possible by the automation ensures that documentation required to meet ever more stringent state and federal regulations can continue to be met while leaving the system to operate automatically outside the day shift.

Cost savings, however, are not the only benefits of the new system, according to Clark. "We now have access to information that we never had before," he explains. "The new system enables us to communicate with all of our pumping stations as well as our towers and our two interconnections with the neighboring town's water treatment plant. It brings all the information to one spot and gives us complete control over the process."

Furthermore, the system provides almost instant feedback on demand levels as well as long-term trend analysis. The bottom line is: it controls the system the way we feel it needs to be controlled."

For example, by monitoring water usage and well levels during the regular filter backwash process, the department has been able to see how the process causes the well level to drop abruptly at one stage.

As a result, the North Reading Water Department can modify the process to reduce water demand at that stage and keep its well at optimal levels. The process monitoring of flow means that the department can now calculate on a minute-by-minute basis the water demands of the 12,500 people in the 13.6-square-mile township.

The rapid access enables the Water Department to see how usage patterns affect water levels in the district's two storage tanks. "The data has been invaluable for us as we study the effects of building a third tank in the near future," says Clark. □

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