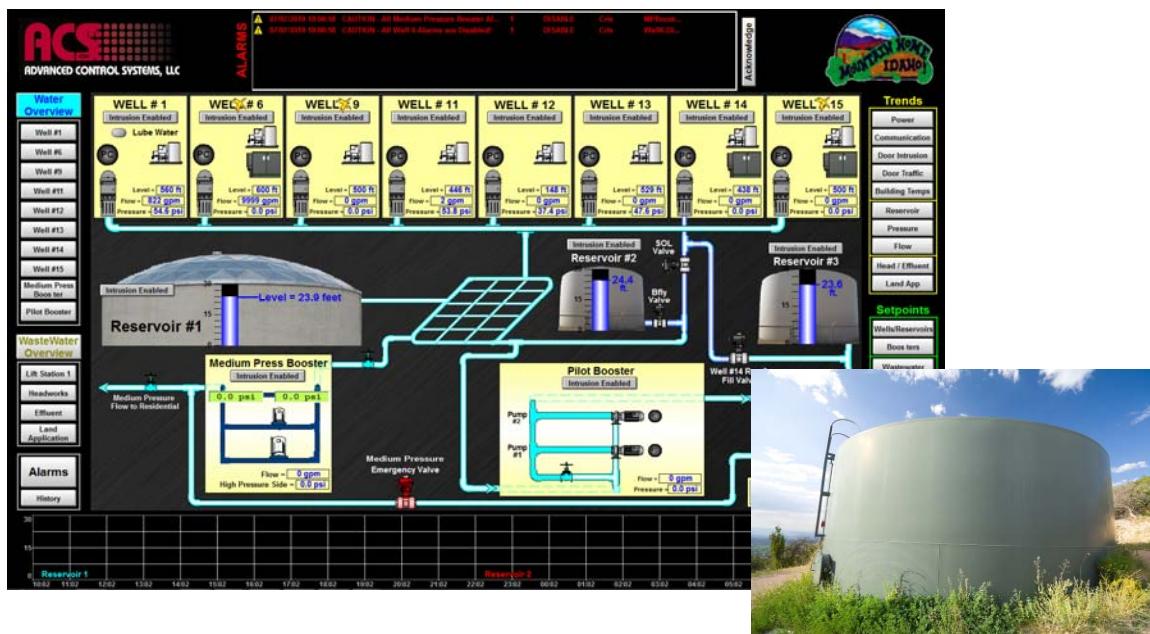


Application Brief

Water Treatment Facility Updated for Improved Reliability to Meet Needs of a Growing Population

Mountain Home, Idaho Automates Water Treatment Plant with Omron Controls and HMI Software, and Radio Emergency Notification



Abstract

Mountain Home, Idaho recognized that the water supply system was no longer able to keep up with the demands of growing population and an expanding business area. In particular, communications had become unreliable between wells, storage facilities and operators. The Public Works Department wanted a water system controls upgrade that was both easily expandable and offered automatic responses to occasional power failures. The solution created by Advanced Control Systems of Boise Idaho, combined Omron controls and InduSoft software for data management with radio communications and Win911 for emergency notification.

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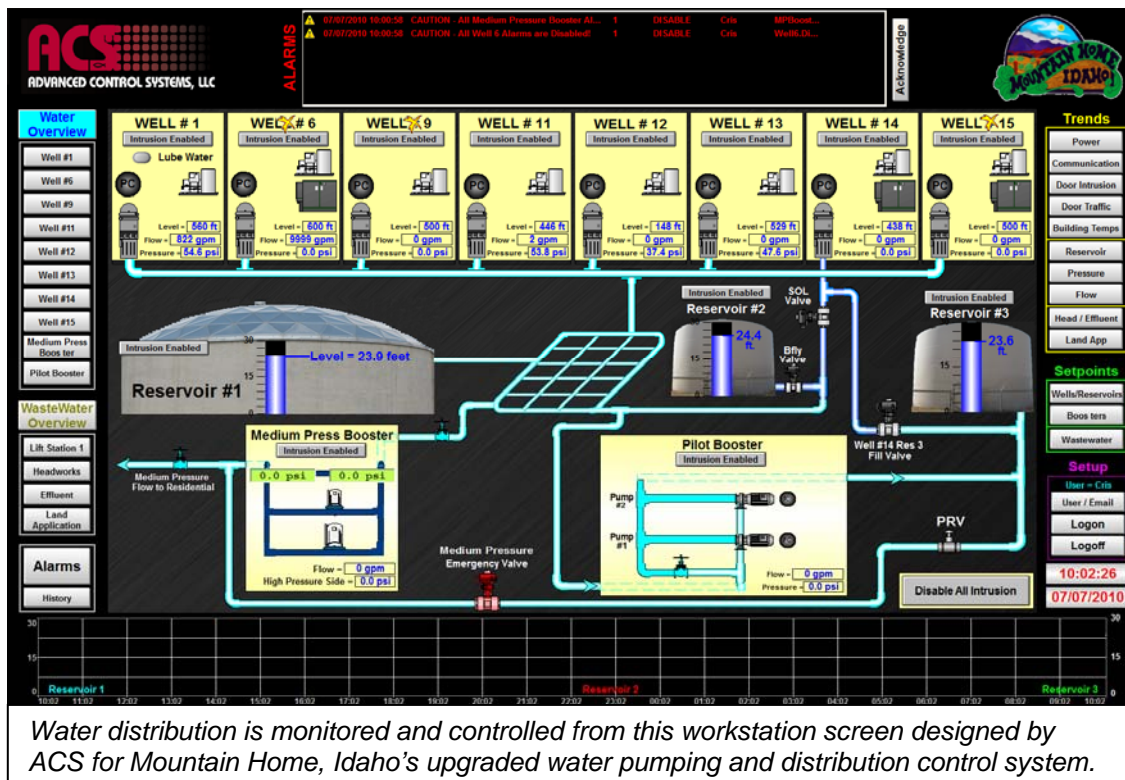
Background

The Mountain Home, Idaho, water/wastewater control system was reaching the end of its useful life and was no longer able to cope with the demands of a growing population and an expanding business area. In particular, communications had become unreliable between wells, storage facilities and operators. The Public Works Department planned a water system controls upgrade that would be easily expandable and offer automatic responses to occasional power failures.

The Challenge

After years of service the communication and data reliability had become a major concern for the local municipality. Intermittent interference, hours of lost communication and crossover caused by use of older frequencies were the main contributors to the data reliability issues. Based on a board level customized product, the current control system made it difficult to find general support and was not easily upgraded from the current platform.

The Mountain Home Public Works Department contracted with Advanced Control Systems (ACS), an experienced integrator for water/wastewater treatment plants, to develop a control system that addressed the current needs with greater communications reliability, and allowed for easy expansion to respond to growing numbers of residential and business users. Occasional power outages made it necessary to equip the system with emergency generators to maintain water service.



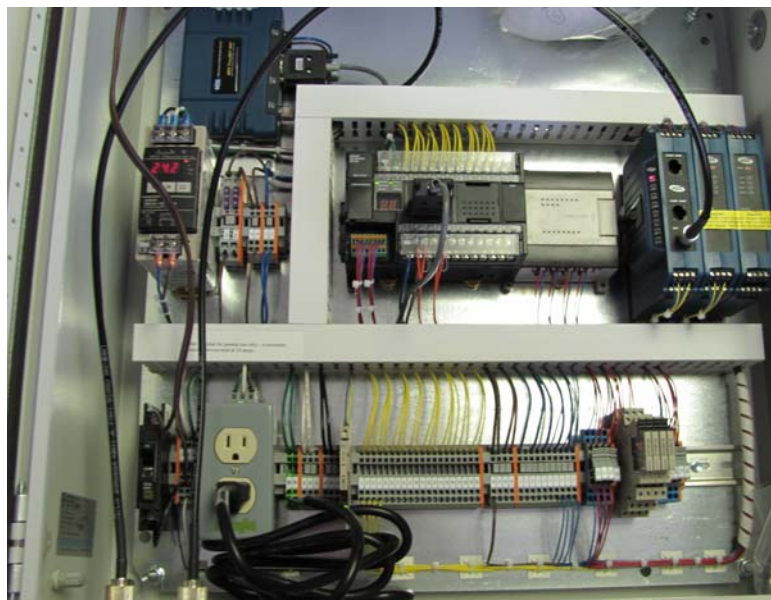
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The Mountain Home water distribution system has over 73 miles of piping ranging across three different pressure zones, drawing from six active wells. Two of the wells are equipped with emergency generators which automatically turn on in case of power outages. The total pumping capacity of these wells is 9500 gallons per minute. There are two booster pump stations in operation. One pressurizes the middle pressure zone and includes Variable Frequency Drives (VFDs) which vary the pumping volumes to match the customer demand. A second booster pump station fills Tank #3 with water to provide storage for the upper pressure zone. There are a total of three tanks. Tank #1 holds 2,000,000 gallons, Tank #2 holds 500,000 gallons and Tank #3 serves the upper pressure zone storage. An additional tank was planned for construction in 2010. The new tank will hold approximately 1,500,000 gallons and will add to the existing storage capacity of Tank #2.

The Solution

ACS worked with Omron's local distributor, Bolen's Control House, Inc., to design the solution the Mountain Home team needed. It consists of Omron's CP1H PLC with Omron-Indusoft HMI/SCADA software operating on the control room workstation PC, combined with upgraded radios. Networking 16 remote stations using serial modem connections has yielded HMI updates in the 3 seconds range with full data reliability and no system downtime. Additionally,

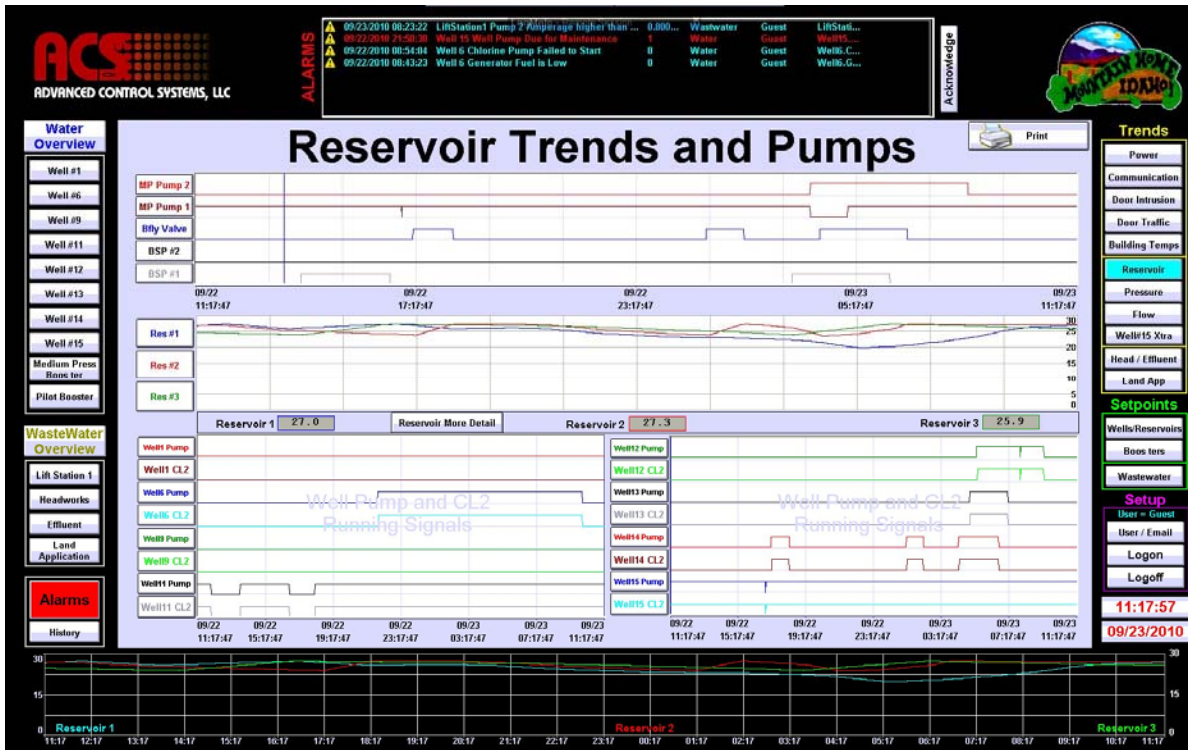
ACS's clever programming allowed for local system control based on historic data for the rare instance that communications might go down.



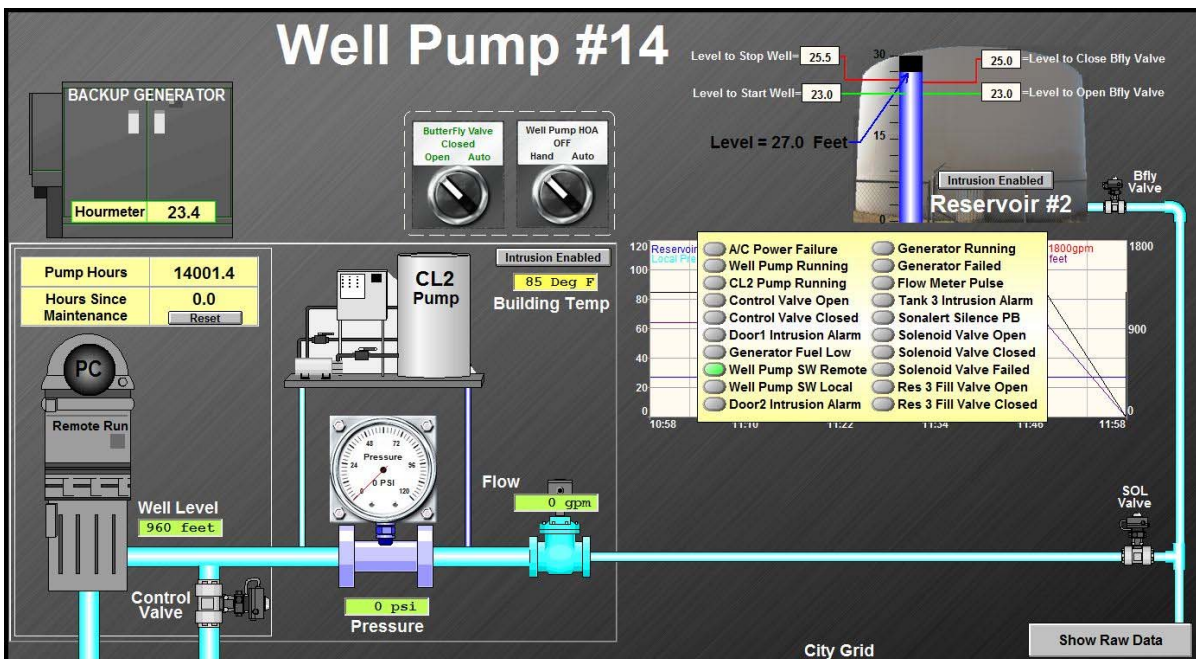
Omron's CP1H micro PLC controls operations and collects data for the water system. The PLC's built-in pulse I/O control a variable frequency drive. The Omron-InduSoft software collects data from all sites and displays it on Central Control workstations.

The networked system provided by ACS uses a radio system--MDS Transnet 900 radio--and analog sensors that are all controlled/monitored by the Omron micro PLC. Select sites use a local HMI for monitoring or bypass control. A Win911 dialer provides a real-time, Windows-based alarm manager to monitor operations and notify personnel of problem conditions. It works with signals from the remote sites to autodial facility staff for maintenance or emergency situations.

Leaving room for easy future expansion and maintenance was something the Mountain Home Public Works wanted as part of the selected system. The Omron micro PLC can be easily expanded at the remote sites and the Omron-Indusoft HMI package and Win911 dialer have the ability to support remote site video if the need arises.



The Trend Display screen for Mountain Home's water system identifies alarms at the top then shows pump activity in the system, reservoir fill level, and water and chlorination flow to maintain fill levels.



A diagnostics window (overlay box at right) provides a quick overview of status and conditions to shorten troubleshooting. Each pumping station diagram displays values from key components.

Application Brief



Results

The Mountain Home Water Department brought a new well online and was able to integrate it easily into the control system. The ACS-designed system delivers the data reliability they need with fast updates for better resolution of data logging and control. It has improved operability and labor efficiency.

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