collaborating

By Trish Woznuk

Process solutions provide unified plant control and easy system migration

Colorado Springs Utilities set out to strengthen control and reduce costs.

The utility serves more than 410,000 customers in the Pikes Peak region.

Conversion from aging legacy distributed control to modern control systems is an important strategy to improve plant performance, but it often is viewed as a complex challenge. Issues of downtime, reliability, training, maintenance and spare parts all are part of the equation. It takes experienced engineers, industry knowledge and technology expertise to find the right solution. Proven project management helps enable a smooth transition and ensure that the project is implemented on time and within budget.

A utility in Colorado used these tools to convert its water treatment plants' control system for annual savings of more than $280,000. Colorado Springs Utilities (CSU), a four-service utility that provides electricity, natural gas, water and wastewater services to more than 410,000 customers in the Pikes Peak region near Colorado Springs, supplies about 24.1 billion gal of water annually.

As a municipal utility, CSU focuses on providing exceptional service while keeping costs low and develops responsible environmental practices and partnerships with nonprofit organizations to contribute to the community. Over the past few years, CSU has upgraded several of its facilities to run more efficiently and reduce operations costs.

In May 2009, CSU's McCullough Complex water treatment plants converted to a fully integrated control system solution, standardized with the utility group's other plants. The new system has greater efficiency, with a savings on control system design, reduced operating and support costs, and reduced maintenance.

WATER COMPLEX CHALLENGE

CSU's goal was to achieve better control and lower life-cycle costs at its McCullough Complex water treatment plants. It wanted to migrate to a new control system to reliably control and monitor a series of pumps, valves, tanks and filters for the process of turning raw water into potable drinking water.

"These two plants account for 70% of the drinking water in Colorado Springs," said Steve DellaCroce, customer operations superintendent at the McCullough Complex. "Monitoring water quality is essential to prevent health hazards and to meet environmental regulations and water demand."

The existing Foxboro distributed control system (DCS) was approaching the end of its life. Spare parts were difficult to find and stock, and in-house aptitude of the legacy system was diminishing as knowledgeable manpower retired. The Unix-based HMI system had limited control and maintenance capabilities, was not user-friendly and required manual control. In addition, a company reorganization left fewer operators and maintenance staff members to accomplish the same responsibilities.

CSU wanted an open control system, or open systems interconnection (OSI), that would be compatible with its existing networks and consistent with its other upgraded plants. It also was important that the migration to the new control system was completed quickly and cost-effectively to reduce downtime. Ease of use, spare parts availability and system operation and maintenance training were expectations. CSU wanted its investment to contribute to the long-term bottom line.

CONTROL SYSTEM SOLUTIONS

An updated control system helps increase monitoring capabilities in less time and with less effort. CSU first hired an independent consultant engineer to do a feasibility study on converting to a Rockwell Automation control

for control

system. A life-cycle cost analysis showed that the company had lower spare parts prices and lower service and training costs than CSU's previous supplier, which results in reduced overall operations and maintenance costs.

CSU had partnered with Rockwell Automation and authorized distributor Rexel to upgrade control systems at several of its other plants. The utility trusted their ability to understand its needs and deliver the best solutions. CSU operations and maintenance staff were confident in the technology, but more importantly, they saw the benefits and bottom-line value that the automation company provides through its Global Solutions team.

This team—comprised of industry specialists with system conversion experience, Rockwell Automation global process technical consultants and a certified project management professional with control system migration experience—partnered with CSU's system consultant to streamline processes through each stage of the manufacturing cycle to help provide quick and cost-effective solutions.

"The Rockwell Automation delivery team was fantastic to work with," said Steve Moore, a senior instrumentation control specialist at the McCullough Complex. "They made the extra effort to get input from all personnel—from executives to operators and maintenance—to make sure we got everything we wanted. They really listened and discussed everything as a team."

With the Global Solutions team's experience and proven project management approach, Rockwell Automation delivered a complete control system solution with an integrated architecture that helped provide low life-cycle costs, enterprise-wide standardization and an economical design-build approach.

By using the group's design-build model, CSU was able to save the cost of a design consultant, eliminate the time-consuming bid process and maintain continuity between plants. The previous installations at other CSU plants meant that Rockwell Automation could use specifications from pre-tested code stored in knowledge management libraries. This reduced development time and cost, and it increased support capabilities while reducing the risks of new implementation.

Rockwell Automation engaged the PlantPAx (Plantwide Process Automation Excellence) process automation system, leveraging core Integrated Architecture technologies and custom solutions for plantwide control. It ties in with CSU's existing SCADA network systems and servers as well as historian OSI PI.

The Integrated Architecture system encompasses the Logix Control Platform, FactoryTalk View SE operator interface and open system networking via ControlNet and EtherNet/IP cabling. Allen-Bradley ControlLogix programmable automation controllers are fully integrated with all aspects of the water treatment process to help operators access plant and production information for better management, decision-making and production automation and optimization. It offers real-time visibility into monitoring water quality for chlorine, turbidity and pH, as well as trending of loads, levels and clarity.

Wireless transmitting allows remote data visibility as well as control from CSU control rooms and from operator and maintenance laptop computers in other areas of the plants.

"The new system uses Microsoft Windows and is really user-friendly, so you don't need a degree in programming," Moore said. "It's a lot easier to make changes, and we can easily add tasks to the new system. I can set up a trend in two minutes to make our system more efficient and more accurate."

The FactoryTalk View software provides a visual representation of the entire plant and allows the plants to share data throughout the distributed system. It simplifies information and automation system design, enables multivendor connectivity and provides central administration of key functions.

TRAINING & SPARE PARTS

As part of the solution package, CSU operations employees received comprehensive onsite training, including after-hours training for multiple shifts. They also have opportunities to attend free training at regional seminars or at the Denver office training facility. Rockwell Automation also can provide group training at the CSU site.

Another benefit to the automation solution was cost savings on spare parts storage and management. By standardizing hardware across CSU's water treatment plants, the McCullough Complex was able to take advantage of an existing agreement, co-managed by Rockwell Automation and Rexel, to store and manage spare parts. The agreement makes sourcing replacement parts a quicker and easier process, helping maximize uptime and simplifying asset management.

The CSU plants all use the same parts, so it is only necessary to stock one of each to use at any plant as needed. The reduction in spare-parts purchase and storage gives CSU operations and maintenance a predictable annual cost and reduces the expense of depreciating assets being stored at each site. Traditionally, spare parts are ordered when something breaks down, making it difficult to estimate spare part expenses each year. By using consistent control systems across the

CSU organization, the skill set required for replacing them is universal.

RESULTS

The new control system was commissioned in May 2009 using Rockwell Automation best practices and CSU standards to provide total cost savings of more than $280,000 annually. CSU was able to reduce annual operating costs by $240,000 due to fewer system operator hours required to perform monitoring and trending tasks. CSU estimates an additional $40,000 annual savings on system support and maintenance thanks to the system's increased control capabilities and ease of use.

"This new DCS has increased our confidence in the control and monitoring. It has a lot more aptitude and is a lot quicker," DellaCroce said. "It reduces our concern about poor water quality because we can run more efficiently and fine-tune our operations."

CSU also said it has received many hours in system and product training from Rockwell Automation. By training employees on one software platform, their skills can be transferred to any CSU facility, which is particularly useful in the event of an emergency. CSU also can leverage its engineering and maintenance services throughout the system life-cycle, including consulting/assessments, design, installation/startup, training, onsite/remote support, asset management and repair services. In addition, the Global Solutions design-build process, compared to a design-bid-build process, resulted in an estimated one-time cost savings of $110,000.

The entire DCS installation was completed on budget and ahead of schedule. The original project proposal called for completing the control system projects within two years with the physical installation/implementation occurring by the end of 2009, during the plants' offseason, when less water is required by the public. The Rockwell Automation team was able to complete the entire project installation/implementation in May 2009—one year earlier than CSU had projected. CSU expects to achieve a full return on investment in less than 36 months. WWD

Trish Woznuk is marketing communications specialist for Rockwell Automation. For more information, contact Dani Litt of Padilla Speer Beardsley at dlitt@psbpr.com or 612.455.1726.

For more information, write in 1104 on this issue's Reader Service Card.

Write in 127