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OPEN SECURE AUTOMATION

Case Study

Arkansas Water Utility Upgrades to Cyber Secure Bedrock Universal Control System

The Russellville Water and Sewer System has replaced a legacy PLC with a secure Bedrock™ industrial control system. Bedrock certified solution provider Brown Engineers, of Little Rock, Arkansas, completed the upgrade in November 2015 and the system has been performing to specifications ever since.

Summary

Customer requirement:
Replace aging PLC with modern, cyber secure platform

Bedrock Automation solution:
Bedrock™ control system

Results:
Running without fail since installation. Customer planning to migrate to all Bedrock systems

The Russellville Water and Sewer System, in Russellville, Arkansas, provides sewage treatment and pollution control for a population of nearly 30,000. The utility relies on Programmable Logic Controllers, (PLCs) for automatic control of its plant equipment which includes digestion blowers, clarifiers, sludge pumps and chlorination chemical feed pumps. But the PLCs it was using were installed many years ago and were becoming obsolete. So when one of them failed, the search was on for a replacement.

"We wanted to replace it with something that would provide a path to the future. The Bedrock™ control system from Bedrock Automation, with its high performance, scalability, and built-in cyber security protection, offered an ideal solution," said Steve Mallett, Jr., P.E., General Manager of the City Corporation, which is responsible for the Arkansas pollution control facility.

Although the Bedrock control system would perform essentially the same function as the legacy PLC, it is a dramatically different control solution. For one thing, it uses an electromagnetic backplane instead of a traditional pin-based backplane. This eliminates pin corrosion and breakage, improving long term reliability and reducing significantly the possibility of intrusion by counterfeit I/O modules. It also creates a galvanic isolation barrier between field wiring and the controller and provides a high performance, deterministic I/O update rate to support current functionality and

additional planned expansions. The new system is also different from the legacy PLCs in many other ways:

- The Bedrock system runs a military-grade safe and secure real-time operating system, further embedding security into the software and firmware used to control the facility.

- It is a simpler, more robust solution that can operate from 90-260 VAC, 125-330 VDC, or 24 VDC without fans or DIP switches. It also embeds standard open system technologies, including OPC UA, a fully compliant IEC 61131-3 programming environment, and standard Ethernet support at the control and I/O networks.

- The Bedrock control system consists of only a dozen part numbers, reducing installation and maintenance costs.

- The system is scalable for more advanced control functions, such as serving as a SCADA remote transfer unit (RTU) or distributed control system (DCS).

"We are seeing increased interest in cyber security among municipal utility clients such as City Corporation," said Dee Brown, P.E. of Brown Engineers. "Many want to control security functions from their tablets and control centers, because their networks are getting hammered every day by probes and attempted intrusions. The Bedrock controller gives them another layer of protection beyond firewalls and VPNs. It is unique in that as it powers up, it checks to be sure that all hardware and software components are validated. Regular PLCs just can't do that."

The Bedrock controller is part of an integrated plantwide SCADA system. Users connect to that system via Ignition software from Inductive Automation, an industrial applications platform that coordinates control and data acquisition for all plant PLCs and remote transfer units (RTUs). Performance of the Bedrock controller has been so successful that plans are now underway to phase in usage across the entire utility.

About Bedrock Automation

Bedrock Automation, based in San Jose, California, is the maker of Bedrock™, the world's most powerful cyber secure automation platform. From Silicon Valley, Bedrock Automation has assembled the latest technologies and talents in both the automation and semiconductor industries to build an unprecedented automation solution for industrial control based on three prime directives: Simplicity, Scalability and Security. The result is a system with a revolutionary electromagnetic backplane architecture and deeply embedded cyber security, which delivers the highest levels of system performance, industrial cyber security and reliability at the lowest cost of ownership.

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