

Providing Reliable and Robust Systems for Water and Wastewater Valve Automation

“There is a \$540 billion gap between current spending and projected needs for a combined water and wastewater infrastructure over the next 20 years.”

Environmental Protection Agency
Analysis 2012

What if...

- You could simplify the automation of your systems?
- You had experts available to support you 24/7?
- You had a reliable single source actuator and controls provider?

There is a nationwide need for a significant investment increase in water and wastewater treatment infrastructure. However, government funding at all levels is being outpaced by a growing population and deterioration of the existing facilities throughout the United States. As the American workforce ages, veteran employees operating these facilities are not being adequately replaced, furthering the gap of operational skill and knowledge. Compounding the situation are constant advances in technologies that demand automation systems to improve efficiencies and increase operational reliability among multiple and differing devices and systems.

PLANT AUTOMATION SYSTEMS ARE COMPLEX

Water and wastewater plant automation is extremely complex. With water influent going through multiple stages of physical, chemical and biological processes, there are often hundreds or more electrically actuated valves and gates controlling flow, level, DO, pH and turbidity throughout the various filtration and disinfection systems in a typical facility. Multiple control loops contain actuators, each with a unique system address, and miles of wiring in the total digital network connected to a Distributed Control System (DCS). All parts of the system need to be reliable and provide a seamless interface with each other regardless of manufacturer.

OUR CONTRACTORS AND INTEGRATORS ARE NOT ALWAYS FULLY KNOWLEDGEABLE

Municipal water and wastewater facilities construction is generally awarded to the lowest qualified bidder. While that is the standard practice, the electrical portion of the project may be subcontracted or directly placed with contractors who do not have an expertise in wiring and installation of electronic networks such as a DCS. Similarly, system integrators are not always capable of efficiently configuring and commissioning complex systems found in the water/wastewater industry. Electrical contractor errors are common and can lead to reverse polarity, ground loops, breaks and network noise. The end result can be rework, system redesign and project delays.

WE NEED A SINGLE, RELIABLE SUPPLIER

Valve, actuator and system reliability is paramount. Slow response, lack of robustness, system failures and unreliable performance are not acceptable in operating a plant with critical needs and requirements to ensure the quality of our drinking water and prevent pollution of our water resources.

Within water and wastewater facilities, applications may range from 1-inch quarter-turn ball valves for chemical injection and odor control, to multi-turn energy dissipation gate valves exceeding 80 inches in diameter and 12-ft x 12-ft slide gates. Inventory requirements for replacement actuators for these valves and spare parts can be significant and extremely difficult to manage.

WATER AND WASTEWATER VALVE AUTOMATION

EMERSON CONTROLS THE ENTIRE NETWORK

Emerson has the expertise, experience and products to work reliably with complex networks as found in water/wastewater facilities. The Bettis Modbus RTU Master Station controls up to 250 actuators per network, supporting Bettis' report-by-exception and priority scanning, interlacing moving valves with others in the network to provide the fastest response time, and operating at a considerably higher throughput. Data is updated with zero delay and is reliably stored, with built-in redundancy. By being brand neutral, the Master Station can support numerous actuator brands. When combined with Emerson's Ovation™ DCS, a component of the PlantWeb™ digital architecture, the open architecture system provides seamless interface with current bus standards and offers the ability to expand with system advancements. Multiple Master Stations can be linked to the DCS, providing a reliable system to control thousands of actuators.



EMERSON HAS APPLICATION AND OPERATIONAL EXPERTISE

An Emerson differentiator is our ability to understand network operation and provide necessary technical assistance to the original equipment manufacturers (OEM's), contractors and system integrators. We can provide recommendations about selecting correct cables with controlled impedance and low capacitance to allow best signal reception at a maximum distance between the actuators. We understand the network operation, can provide expertise with open architecture systems and are often consulted to commission Emerson and non-Emerson actuators. Our local business partners, factory-trained service personnel and engineering support are available to assist at any stage of project installation, commissioning and start-up. Emerson can also assist with system design, training for the best network installation practice, and network start-up.

EMERSON CAN BE YOUR RELIABLE SOLE SOURCE

Emerson's product offering of Bettis electric valve actuators has been performing reliably in water/wastewater applications for decades. We have a broad range of actuators for quarter-turn and multi-turn operations within the plants that can be configured with remote display modules for operation in confined spaces or with compact facility footprints. The advanced TEC2000 utilizes field-proven technology with state-of-the-art features that allow extended submersion and a non-intrusive housing for reliable, trouble-free operation. When the need is for compact or lightweight actuators on small quarter-turn valves, the HQ provides a reliable solution. The M2CP actuator provides a robust, long-lasting product that is recognized for its performance. All models meet AWWA standards and are capable of operating in a single digital network at high speeds over long distances, while reducing wiring costs by up to 60 percent. Bettis can support your facility with local factory trained technicians and spare parts inventory.

“Bettis’ systems engineer did a phenomenal job designing operating software capable of interpreting data scans sent from the job site. Data scan analysis of the digital communication loops, some as long as 20,000 feet, was instrumental in diagnosing network wiring integrity problems, reducing time to correct from days into hours.”

Project Engineer – New York Water Treatment Facility

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