



**ENTERPRISE
AUTOMATION**
A TETRA TECH COMPANY

PROJECT PROFILE

Modicon M580 PLC upgrade *South Coast Water District*

Client background

South Coast Water District (the District) owns and manages various water treatment assets in southern Orange County. With comprehensive infrastructure, including nine pump stations, 13 reservoirs, and over 12,000 water connections, the District's services are crucial in providing safe and reliable water services. The District has been recognized as a premier water district for their achievements in customer service, reliability, environmental stewardship, and organizational excellence. Given their strategy for continuous infrastructure improvement and preparedness, it was natural they sought a control systems partner that resonated with and realize their vision for high-quality services.

Enterprise Automation (EA) first engaged with the District in 2019, initiating a project to replace an obsolete Programmable Logic Controller (PLC) at one of their Ozone treatment facilities and has worked on a variety of projects with the District since.

Project background

After completing the Ozone treatment facility project, the District brought on EA to upgrade the PLC panels at Pump Stations 8 and 9 (PS8, PS9) which work together. PS9 acts as the lag station to PS8's lead station. Therefore, the booster pump at PS9, which increases water pressure within the distribution system, will only turn on if the pumps at PS8 are unable to maintain pressure in the distribution zone.

These projects were executed simultaneously to extract efficiencies in co-design and implementation. As part of an ambitious improvement plan, these projects included the upgrade of existing PLCs to the flagship Modicon M580 PLCs, replacement of the local Tesco Operator Interface Terminals (OITs), removal of unnecessary components, and optimization of systems for enhanced efficiency across the board.

Project Manager



**Paul
Rahmanian**

Project Technical Lead



**Zack
Gentry**

Key Insights:

- Upgraded PLCs to Modicon M580 across Pump Station 8 and Pump Station 9
- Developed tag standard documentation and PLC device standards specifications

Key Technologies:

- Modicon M580 PLC
- Tesco OIT Software
- TopView alarm software

EA Solutions

Investing in standardization across hardware, programming, and workflows maximizes the value extracted from new technologies. A lack of standardization increases the risk of communication failure between devices, undercutting the benefits of even top-of-the-line PLCs with the highest processing speed. As EA worked to enhance the control systems at South Coast Water District, standardization remained a chief priority. These enhancements involved the design, configuration, testing, and commissioning of the pump station PLC panels, and OIT replacements. These upgrades were designed to support the standardization of each existing pump station and future pump stations to come.

Upgrading to Modicon M580 PLCs increased the system's longevity and established a framework that would facilitate future modifications. The M580 PLCs are secure and designed with an open architecture, making it compatible with various systems and devices. Open platforms futureproof operations by allowing organizations to bypass vendor lock-in and decoupling software from hardware.

The District's devices use alarms triggered by factors such as speed, power failure, pressure deviation, and temperature. EA created additional alarms and setpoints to provide the District further flexibility in managing its water infrastructure. The precision and prioritization levels within the alarm system empower the District operators to address alarms and errors with more efficiency while minimizing downtime.

In addition to the typical design phase tasks, EA developed tag standard documentation and PLC device standards specification as a value-addition for the pump station project and future implementations for the District. Any effort to upgrade sites with missing documentation must start with extensive reverse engineering and control strategy review. Established standards avoid this issue. Pre-determining how particular functions work saves time during the programming and design stages. The use of standards reduces overall programming effort, improves testing efficacy, makes a system easier to maintain after commissioning, and makes future upgrades significantly less expensive. EA leveraged their extensive library of standards and best practices to generate a specialized solution for the District.

Following the design phase, EA developed programs for the PLC and the OIT based off the functional specifications and the existing InTouch and OIT screens at the other sites. Before commissioning, EA developed and executed internal testing procedures to make sure the program developed for the new PLC, PLC panel, and OIT functioned properly. EA tested the PLC point to point against the functional specification and tested each button/function for the OIT.

Enterprise Automation's successful execution of the PLC upgrade addressed current challenges and set the stage for South Coast Water District's resilient and standardized future. As a trusted partner, EA will continue to empower organizations to navigate the complexities of water management with confidence and efficiency.

Enterprise Automation, A Tetra Tech Company (NYSE:TTEK), a nationwide process automation consultant - plans, designs, documents, builds, tests, deploys, and supports critical automation and OT infrastructure for process industries.

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