ABSTRACT for the 2017 ISA WWAC Symposium

Case Study: WTP2 PLC Upgrade Project

As-builting, Design, Fabrication, Installation, Testing & Commissioning

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Modicon Hot-standby Remote-I/O PLC, upgrading programming language to IEC-61131, Ethernet Remote IO (ERIO).

ABSTRACT

The Alameda County Water District (ACWD) recently completed a $2Million Programmable Logic Controller (PLC) control system modernization at it's existing potable water treatment plant, Water Treatment Plant No2 (WTP2). WTP2 is the District's main water treatment plant, and one the District cannot live without; due to this production constraint the project had to be fast paced and performed with no additional annual outage time at the treatment plant. This critical upgrade constituted the largest single re-investment in automation the District has undertaken to date.

The existing 25year-old PLC control system consisted of three (3) Remote Input/Output (RIO) Hot-StandBY (HSBY) PLCs, one (1) single-CPU RIO PLC and one (1) stand-alone PLC; all Modicon 984-series. The driver for the project was the obsolete 984-Series PLC hardware, which is no longer supported by the manufacturer and the District was running out of spares. In scoping the project, the PLC programming environment, SCADA network infrastructure, and network security were additionally identified as obsolete and/or deficient.

The project was implemented in phases, over three (3) years, utilizing multiple contracts for fabrication, programming and installation. The District provided design and commissioning resources in-house for this project. To ensure a successful implementation project phases were defined under the following premise: prioritize impact of failure, constrain project work to available outages and maximize probability of success. The result of this project is a documented and maintainable control system with greater reliability, redundancy and network security.

Key lessons from this project will be presented, including:

- Understanding upgrade cost ratios: labor verse hardware.
- Dealing with undocumented systems and networks.
- Controlling the temptation for scope creep.

Opportunities for in-house knowledge growth.

ABOUT THE AUTHORS

Benjamin John Stanley Egger P.E. *has worked as an Electrical Engineer in the Project Engineering Department at Alameda County Water District, Fremont CA, since 2008. Proud father of two, cycling enthusiast, and an Australian. Contact: benjamin.egger@acwd.com*