

2011 Process Control Systems (SCADA) Master Plan

In February 2011, Valley Water completed its first Process Control Systems (SCADA) Master Plan.

The Process Control Systems Master Plan provided a road map to guide Valley Water in its identified upgrades, replacement, and expansion of its process control and SCADA systems through the year 2021.

The collaborative plan included the participation of Valley Water Engineering, Operations, Maintenance, Water Quality, Information Technology, and Capital Planning staff. It followed a well-established methodology for the evaluation of process control and SCADA systems and included an evaluation of the costs and benefits of automation improvements as covered in the American Water Works Association Research Foundation Report - The Costs and Benefits of Complete Water Treatment Plant Automation.

The 10-year plan included recommended technical improvements and identified budget, schedule, and resource requirements for their implementation, intending to be updated as progress was made and as conditions changed over time.

The work throughout the document was structured around “three levels of process control system improvements”. This approach focused toward identifying changes and improvements in the following categories or “Levels”:

- Level 1 – Changes to support the current level of Valley Water operations
- Level 2 – Changes to provide or enable process and operations improvements by providing better tools for operations
- Level 3 – Changes to provide or enable optimized operation, defined as making the process control systems as functional and effective as possible or providing more “intelligent features”

The Master Plan identified the following seven projects for implementation:

- 1) Process Control System (PCS) Standards – Establish and document the PCS design standards, Human Machine Interface (HMI) and controller standards, SCADA security standards, and standards for management of changes
- 2) HMI Improvements – Development of improved graphic displays, enhanced alarm management, procurement and configuration of the replacement HMI (if needed), and related activities

- 3) Remote Architecture/Communications Upgrade – Detailed design and replacement/upgrade of the remote controls and communications infrastructure
- 4) Process Control/Automation Improvements Phase 1 – Detailed evaluation of individual process control systems, focusing on instrumentation and control element replacements and upgrades and process sequence improvements
- 5) Process Control/Automation Improvements Phase 2 – Automation improvements focused on process optimization, energy efficiency, and data access
- 6) SCADA Expansion – Provide improved monitoring and control of remote recharge and stream outflows
- 7) Automation Program Maintenance – Overall coordination efforts and management activities associated with implementation of the projects

An opinion of probable costs for the recommended improvements projects was provided in the plan. This included consultant design services, materials, installation, programming and system integration and construction phase oversight. Budget estimates were also included for Valley Water's ongoing program management and Owner's Engineer support efforts needed for the work. The costs presented in the master plan were the estimated costs for the projects themselves, and did not include full life cycle costs, such as maintenance costs associated with the asset life cycle, for example.

