Simplifying Control of your Water Treatment Plant - Wireless SCADA System Case Study

Michael Buzicky, P.E.
Kevin Stock

Sangamon Valley Public Water District
Mahomet, Illinois
GOALS OF THE SCADA SYSTEM

- Simple to Operate
- Expandable for Future Sites
- Provide Operator Monitoring and Input
- Wireless
- Remote Monitoring
- Cost Effective
- ‘Talk’ with Proposed PLC Units

Proposed SVPWD SCADA Sites

- New Water Treatment Plant and Clearwell Tank
- Existing Elevated Tank
- New Remote Booster Station & Tank
- New Well

Future SVPWD SCADA Remote Sites

- Waste Water Treatment Plant
- Pump Stations
- Existing Wells
Who Could Benefit From Having a SCADA System?

- Water and Waste Water
- Industrial Manufacturing - Machine Condition Monitoring
- Medical & Pharmaceutical Manufacturing
- Oil & Gas
- Energy/Power
- Flood Control Monitoring
- Government/Defense/Aerospace
Why is a SCADA System Important?
**Specifically Related to Water and Wastewater But Not Limited To.**

- Allows an operator to monitor and control processes that are distributed among various remote sites.
- Monitoring- Water Tower Level, Water Pressure, Chemical Levels, etc..
- Ability to turn on or off Equipment
  Example: Turning on Pumps to replenish water in a Tank or Tower
- Alarming in the event of possible leaks or malfunctions long before human engineers can find the same problems

Why is a SCADA System Important?

- Reduces operational costs
- Provides immediate knowledge of system performance
- Improves system efficiency
- Increases equipment life
- Reduces costly repairs
- Reduces number of man-hours (labor costs) required for troubleshooting or service
- Frees up personnel for other important tasks
SVPWD – SCADA Technology Platform

- **SCADA Software Suite**
  - Primary Interface – Located at the Plant
  - Turnkey - User Friendly Software

- **PLC - Programmable Logic Controller - Tonka Filter Panel**
  - An industrial computer control system that continuously monitors the state of input devices and makes decisions based upon a custom program to control the state of output devices.
  - Example - Allen Bradley PLC

- **RTU - Remote Terminal Unit - Wells & Booster Site**
  - A microprocessor-controlled electronic device that interfaces objects in the physical world to a SCADA system by transmitting telemetry data to the software.

- **Forward Compatible Technology Platform**
  - Expandable for growth and future technology
  - Example - Condition Monitoring - Motors

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SVPWD - SCADA System Features

- Off-the-Shelf Turnkey Software
- Real-Time Information
- Log History - Every Second
- Print Reports - Excel, Word
- Control Equipment Remotely
- Historical/Instant Trend Graphs
- Predict Problems
- Alarm/Notify Instantly
- Remote Access - Smart Phone App
SVPWD - SCADA System Overview Chart

- Levels
- notification/alarms
- Conditional Alarms
- Reports
- Trends
- Levels

PC with SCADA Software

- Real Time Monitoring
- Tonka Panel
- Internet

SVPWD Water Treatment Plant

- Notifications
- Cell phones
- Smartphones
- Tablets
- E-Mail

WEB Enabled Remote Access or Phone App

LAN Network

Remote or Local LAN

SVPWD - Google Earth Overview
SVPWD - Path Study Overview

Communications

SVPWD Communications Platform:
- Mission Critical Radio Supplier
- 902-928 MHZ - Unlicensed Radios
  - Jamming Resistant Frequency Hopping Spread Spectrum
- Forward Compatible Technology
- Fast Speeds
- No Monthly Cost
Mesh Radio Technology

- Radios Communicate to One Another
- Determine Strongest Signal
- Millisecond Transmission Speed
- Secure - Jam Resistant

SVPWD - Water Plant SCADA Panel
SVPWD - Booster SCADA Panel

SVPWD - Distribution Overview
SVPWD - Production Treatment

SVPWD - Chemical Feed System
SVPWD - Pur-IX System

SVPWD - Water Treatment Plant Pump Details
SVPWD - Well 1

Design & Implementation

- PLC as Primary Control, SCADA Secondary
- SCADA design utilized PLC structure, screens, I/O, and functionality
- Booster Station Remote Site to serve as template for future remote expansions
- Incorporating Owner and Operators a plus
- Treatment Equipment and Project only as good as the Controls
Questions?

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