

Project Experience

SCADA System Telemetry Investigation Services & Alternatives Study

City of Redwood City, Redwood City, CA

Timberline Engineering assisted the City and its SCADA system integrator in analyzing communications between

REDWOOD CITY



PC-based master stations and PLC-based RTUs. The City has two co-located SCADA systems, one for its water system, the other for its wastewater system. Each uses Wonderware NT software, Pentium-133 computers, Advanced Digital Network (ADN) leased telephone lines, and Allen-Bradley SLC5/03 RTUs with DF-1 communications protocol. This investigation involved onsite troubleshooting and testing, data communication analysis, and development of recommendations for problem resolution.

The SCADA telemetry system uses City-owned CSU/DSU equipment and ADN leased lines. Each ADN serves as a point-to-multipoint synchronous communication network, one dedicated to 22 water remotes, the other to 42 wastewater remotes. Because of unreliable ADN performance, poor maintenance support by the service provider and high monthly costs, the services of Timberline were retained to study alternatives.

Timberline reviewed the current telemetry configuration, maintenance history and overall performance. Alternatives suitable for both centralized and distributed SCADA architectures were evaluated. Criteria were established by which alternative technologies could be compared. Timberline developed a methodology for analyzing seven alternatives. The general criteria included ten factors under the categories of cost, maintenance and performance. Through staff interviews, the relative importance of each factor was established and alternatives were ranked based on how well it met the criteria.

Timberline developed system configurations for the three best technologies for the Redwood City application. System hardware was configured for licensed MAS, spread spectrum MAS, a hybrid licensed/unlicensed MAS, and single and multiple domain packet-switched networks. Timberline recommended spread spectrum MAS using two geographically separate masters to meet coverage, data speed and data throughput requirements.

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