ENTERPRISE AUTOMATION
A TETRA TECH COMPANY

PROJECT PROFILE

Hydroelectric power generation system

Sweetwater Authority

Client background

Sweetwater Authority provides water treatment and distribution to 200,000 people in a service area that covers 32 square miles near San Diego, California. It is a publicly owned water agency governed by an elected Board of Directors. Since 1977 Sweetwater Authority has provided water services from three primary sources: freshwater ground wells, Sweetwater reservoir, and the San Diego Formation wells which provide brackish groundwater. Enterprise Automation has provided automation and integration services for Sweetwater Authority since 2005.

Project background

The Perdue Treatment plant is the main source of treated water for Sweetwater Authority (SWA) customers. The treatment plant can process water from 3 sources: (1) surface water collected in the Sweetwater reservoir, (2) untreated water supplied by San Diego County from the Colorado River, or (3) treated water supplied by San Diego County. While treated water is expensive to import, the other two options provide cost-effective water sources for SWA. During drought conditions, they generally receive untreated water from San Diego County, which is transported and delivered at over 150psi. Since the water treatment process happens at atmospheric pressure, all of this potential energy is wasted when the water is brought into the treatment plant. By using hydroelectric turbines to reduce the pressure, the plant can use this captured energy.

EA solution

EA provided the entire controls system to handle the fully automated startup, shutdown, and flow balancing of the entire dual hydro turbine station. Engineers developed sophisticated control philosophies to ensure that no matter what quantity of water was need into the plant, the station would be optimized to maintain constant pressure and produce optimal electric output. Prior to deployment, engineers conducted extensive simulation to verify operation and ensure startup was a quick and smooth process.

Project Manager

Matt Avila

Project Technical Lead

Alex Coker

Key Insights:

- Designed control system for hydroelectric power generation
- Automated startup, shutdown, and flow balancing

Key Technologies:

- Citect SCADA
- Modicon M340

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