

Network Control Solution

RD108 uses Network Control to help the environment and lower operating costs

Situation

Reclamation District No.108 (RD108) pumps its irrigation water directly from the Sacramento River. The river is the largest in California and serves as a critical migration route for Chinook salmon, along with other endangered fish species. To prevent these fish from entering their irrigation channel system, government resource agencies directed RD108 to screen three of their largest pumping plants along the river.

RD108 determined that replacing the three plants with a single screened plant, with interconnecting channels, was the most cost-effective solution. However, it would require constant operator action to control the pumps, maintain channel water levels and react to variable irrigator demand. Otherwise, there would be large water level fluctuations in the channels, making it difficult to provide consistent flows at offtakes. Keeping the pumps running permanently was one solution, but would have resulted in unacceptably high energy costs and large outfalls.

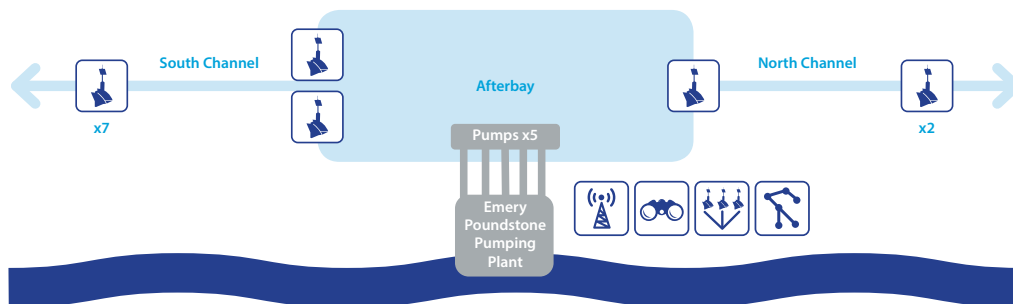
Solution

In 2008, RD108 completed construction of the Emery Poundstone Pumping Plant. The new plant features state-of-the-art fish screens and utilises two variable-speed and three fixed-speed 150 ML/d pumps to divert water from the river into a limited capacity afterbay. The afterbay feeds two primary channels, which in turn feed six secondary channels.

Rubicon implemented a Network Control Solution to automatically manage the pumps, afterbay and primary channels. Flow into the secondary channels is controlled by FlumeGates and operators use SCADAConnect® to remotely set flow rates at these offtakes to meet downstream irrigator demand.

On the North Channel, a relief pump station controlled by a third-party SCADA system has been integrated with the Network Control solution which automatically compensates for changes in flow made by the third-party system.

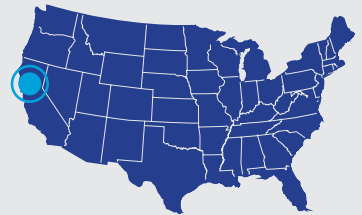
System overview



An aerial view showing the new pumping plant drawing water from the Sacramento River into the afterbay, which feeds the North and South channels.

USA

Grimes, California



Customer profile

RD108 lies along the western edge of the Sacramento River in Northern California. RD108 is one of the largest agricultural water providers on the river, delivering water to nearly 19,000 hectares of farmland primarily growing rice.

Solution components

Software



SCADAConnect



Network Visualisation



NeuroFlo

Hardware



FlumeGate



Radio Network

- FlumeGate x12
- Master radio tower at pump station

Meeting variable downstream demand

The key task of Network Control is to ensure that the requested flow rates at the offtakes are met, while still maintaining the desired water levels in the primary channels.

NeuroFlo® software coordinates and controls actions of the FlumeGates™ regulating the primary channels and also controls the pumps so that they supply the exact amount of water needed by the downstream network.

When channel water levels begin to drop as a result of extractions at the offtakes and service points connected to the primary channels, NeuroFlo automatically generates commands for FlumeGates to increase the flow rate into each of the pools upstream and for the pumps to vary their flow rate so that the desired water levels are maintained along the channels.

Results

RD108 has met the requirements of the government resource agencies by dramatically reducing the fish take while ensuring that energy and other operational costs are minimised.

Network Control ensures the right amount of water is pumped from the river, water level fluctuations are minimised and the required flow rates at the offtakes are met.

Water levels are now maintained within 75mm of their designated level 97% of the time. With stable water levels and reliable flow rates, channel operators can provide a better service to customers downstream.

Channel water levels maintained



The SCADAConnect graph illustrates a FlumeGate along the South Channel automatically adjusting its flow rate (blue line) to maintain the channel water level (green line)

SCADAConnect remote monitoring and control



SCADAConnect allows operators to remotely monitor the pump station and control FlumeGates at the six offtakes



NeuroFlo software controls the actions of the FlumeGates and the flow rate of the pumps to maintain stable water levels.

“With Rubicon’s Network Control Solution we pump only the water we need. We’re able to keep more water in the river and save pumping costs. When we made the decision to go with Rubicon hardware and software products, we were sure they could handle our unique situation. We haven’t been disappointed.

Lewis Bair, RD108 General Manager

“Having the Rubicon FlumeGates working together with the variable speed river pumps has simplified operations. The Rubicon system maintains stable canal levels which is essential for providing our water users a constant flow rate during the irrigation.”

Chad Navarrot, RD108 Operations Manager

About Rubicon Water

Rubicon Water delivers advanced technology that optimises gravity-fed irrigation, providing unprecedented levels of operational efficiency and control, increasing water availability and improving farmers’ lives.

Founded in 1995, Rubicon has more than 30,000 gates installed in TCC systems in 15 countries.