



Network Control Solution

Oakdale implements Network Control for stable water levels and spill elimination

Situation

Following an evaluation of performance, Oakdale Irrigation District (OID) embarked on a program to modernize their gravity distribution system. In particular, they aimed to reduce operational spills and improve service by reducing fluctuations in canal water levels. With stable water levels, OID would be able to provide more consistent flows at customer turnouts and downstream divisions.

OID identified two key laterals where improved control would realize significant benefits:

- The 6.5 mile Claribel lateral, which has 17 pools and supplies 75 farmer turnouts and four lateral headings. It was a priority to significantly reduce annual spills of more than 1,700 acre-feet.
- The 8.5 mile Cometa lateral, which has 13 pools and a canal slope of up to 0.8%. This swift-moving canal required frequent operator adjustment to supply water to 21 farmer turnouts, seven lateral headings and two separately managed downstream divisions. It was difficult to meet required flow setpoints for the downstream divisions while maintaining stable water levels.

Solution

On both canals Rubicon implemented a Network Control Solution, replacing 42 gates in 30 structures with FlumeGates®. Six turnouts along the Claribel canal were also automated with SlipMeters®.



The solution included a telemetry network, a server running SCADAConnect® and NeuroFlo® software, the brains behind the coordination and automatic control of the network of FlumeGates and SlipMeters.

Network Control autonomously coordinates and controls all the FlumeGates so that the water passed through each check structure exactly matches measured outflow at all points downstream.

FlumeGates are in constant communication with each other and with the server, sharing information about water levels and flows along the length of the canal in real time. This means that water level fluctuations are minimized, ensuring high flows and a high level of service to all farms along the canal.

“Automating two laterals has allowed us to better manage our water and enhance service levels to farmers. Farmers have benefited from consistent flow rates, which the system is able to achieve by closely matching demand and supply.”

Steve Knell, PE., OID General Manager



USA

Oakdale, California



Customer profile

Oakdale Irrigation District (OID) is a 72,000 acre irrigation district located in the San Joaquin Valley of Central California.

OID manages a 100 year old gravity flow system diverting about 300,000 acre feet per year to a mix of irrigated agriculture farms, pasture land and municipal users (2,800 farmers and domestic users near Oakdale).

Solution components

Software



SCADAConnect



Network Visualization



NeuroFlo

Hardware



FlumeGate



SlipMeter



Radio Network

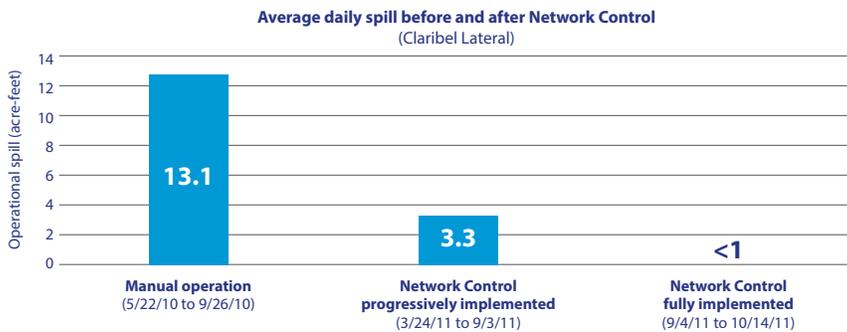
- FlumeGate x42
- SlipMeter x6

Results

Operational spill reduction, water level control, service to irrigators and delivery of flow commitments at lateral headgates have all greatly improved since the implementation of the solution. Examples of performance pre- and post-implementation are shown below.

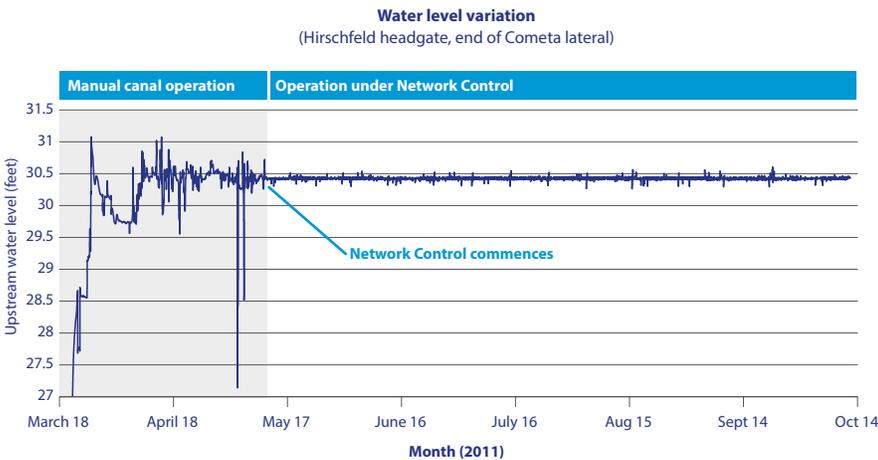
Operational spills eliminated

Since the implementation of Network Control on the Claribel Lateral, unintentional operational spills have been completely eliminated as shown below. Based on 2010 season spill figures this would result in an equivalent savings of more than 1,700 acre-feet of water. Also, more consistent flows through turnouts have enabled farmers to irrigate more efficiently.



Water levels stable and flow commitments met

The implementation of Network Control on the Cometa Lateral has seen significant improvements in both canal water level variation and the consistency of flow to downstream divisions. Below is a graph of upstream water level at the Hirschfeld Headgate, which provides flow to one of the Cometa's downstream divisions. Under manual control, the water level varied significantly. Under Network Control, water level is tightly controlled which ensures consistent flows to farm turnouts and downstream divisions.



Claribel spill before and after Network Control



Operational spills are eliminated and upstream pool level is maintained

“ Our farmers recognize the benefits of upstream level control and our ditch tenders recognize the benefits of continued automation. ”

John Davids, P.E., OID District Engineer

“ We always have the required flow to the downstream divisions, we never lose it like we used to. ”

Michael Evans, OID Ditch Tender

About Rubicon Water

Rubicon Water delivers advanced technology that optimizes 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 and meters installed in TCC systems in 15 countries.