RUBICON™

Network Control Solution

Oakdale implements Network Control for stable water levels and outfall elimination

Situation

Following an evaluation of system performance, Oakdale Irrigation District (OID) embarked on a program to modernise their gravity distribution system. In particular, they aimed to reduce outfalls and improve service by reducing fluctuations in channel water levels. With stable water levels, OID would be able to provide more consistent flows at farm service points and channel offtakes supplying downstream districts.

As part of its modernisation program, OID identified two key channels where improved control would realise significant benefits:

- The 10 km Claribel channel, which has 17 pools and supplies water to 75 farm service points and four channel offtakes. It was a priority for OID to significantly reduce annual outfalls of more than two gigalitres, while ensuring that customer service was not adversely affected.
- The 14 km Cometa channel, which has 13 pools and a channel slope of up to 0.8%. This swift moving channel required frequent operator adjustment to supply water to 21 farm service points, seven channel offtakes and two separately managed downstream districts. It was difficult to meet required flow setpoints for downstream districts while maintaining stable water levels at all farm service points using traditional methods.

Solution

On both the channels, Rubicon implemented a Network Control Solution, which is one of a range of solutions built from TCC® (Total Channel Control®) technology. This involved replacing 42 gates in 30 structures with FlumeGates®.

OID also automated six service points along the Claribel channel with SlipMeters®.

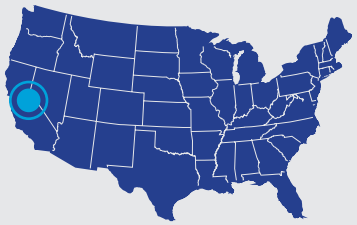
Key elements of the solution included a server running SCADAConnect® and NeuroFlo® software, the brains behind the control of the networked FlumeGates and SlipMeters. Communications were supplied using a Rubicon telemetry network.

Network Control automatically coordinates the regulators in the two channels so that water passed through them exactly matches measured outflow at all points downstream.

All regulators are in constant communication with other upstream and downstream regulators and with the server, sharing information about water levels and flows along the length of the channel in real time. This means that water level fluctuations are minimised, ensuring high flows and service levels to all farms along the channel.

> "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, OID General Manager

USA
Oakdale, California



Customer profile

Oakdale Irrigation District (OID) is a 29,000 hectare irrigation district located in the San Joaquin Valley of Central California.

OID manages a 100 year old gravity flow system diverting about 370 gigalitres per year to a mix of irrigated agriculture farms, pasture land and municipal users (2,800 farmers and 700 domestic users near Oakdale).

Solution components

Software

Hardware

- FlumeGate x42
- SlipMeter x6

Case Study

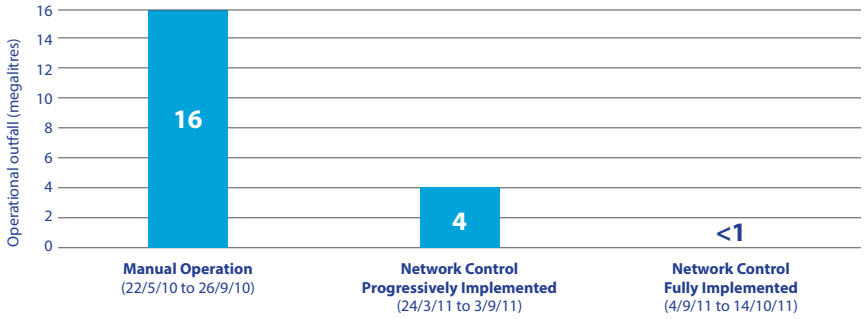
Results

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

Outfalls eliminated

Since the implementation of Network Control on the Claribel channel, unintentional outfalls have been completely eliminated as shown below. Based on 2010 season outfall figures, this would result in an equivalent savings of more than two gigalitres of water. Also, more consistent flow through service points have enabled farmers to irrigate more efficiently.

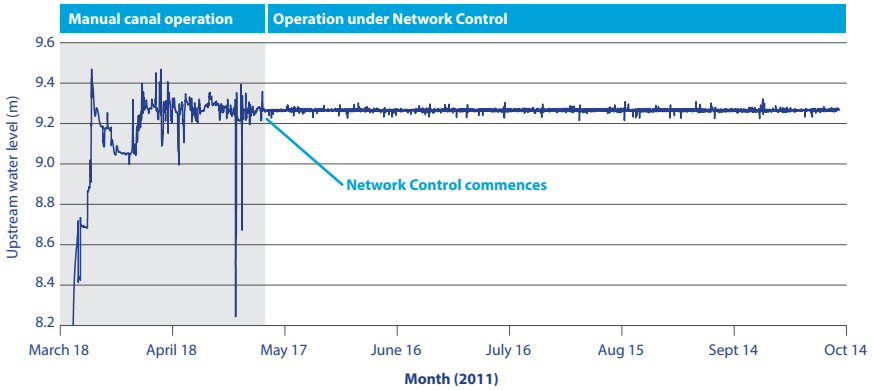
Average Daily Outfall Before and After Network Control
(Claribel Channel)



Water levels stable and flow commitments met

The implementation of Network Control on the Cometa channel has seen significant improvements in both channel water level variation and the consistency of flow to seperately managed downstream districts. Below is a graph of upstream water level at the Hirschfeld headgate, which provides flow to one of the Cometa's downstream districts. Under manual control, the water level varied significantly. Under Network Control, water level is tightly controlled which ensures consistent flows to all farm service points and channel offtakes.

Water Level Variation
(Hirschfeld Headgate, End of Cometa Channel)



Claribel outfall before and after Network Control

Outfalls are eliminated and upstream pool level is maintained.

> "Our farmers recognise the benefits of upstream level control and our ditch tenders recognise the benefits of continued automation."
>
> John Davids, OID District Engineer

> "We always have the required flow to the downstream divisions, we never lose it like we used to."
>
> Michael Evans, OID Channel Operator

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 25,000 gates installed in TCC® systems in 15 countries.

CS-ONCS-04/18-AU

1 Cato Street
Hawthorn East
Victoria 3123
Australia

Tel: +61 3 9832 3000
Fax: +61 3 9832 3030
enquiry@rubiconwater.com

www.rubiconwater.com