



Network Control Solution

Naches-Selah automates a complex channel system and improves delivery reliability and safety

Situation

The Naches-Selah Irrigation District's steep terrain and ageing manually channel system made it challenging to operate. The district has steep channels (with slopes of up to 1:500) and a variety of conduits are incorporated into the main channel, including elevated flumes, tunnels and siphons.

In addition, with no formal water ordering system and a number of large water users, demand is always unpredictable. It was difficult for channel operators to react quickly enough to water user demand, to make the frequent manual gate adjustments needed to maintain pool levels. This resulted in the risk of water over-topping channel banks or pools being drained. Large channel water level fluctuations and outfalls were common.

NSID developed an improvement plan to upgrade critical infrastructure and make the system easier and safer to operate while improving supply reliability and reducing outfalls. A gravity flow waste pipeline and a regulating reservoir to pump extra water into the channel during high demand periods were both rejected as being too costly to construct or run. Eventually the plan settled on the automation of the district's main channel.

Solution

NSID began their automation journey with Rubicon in 2007 with a Site Management Solution, which involved installing FlumeGates® along their main channel and remotely operating them using SCADAConnect® software. With remote operation, changes could be made much more frequently and safely, which resulted in significant service improvements.

However, the large, unplanned changes in delivery flows by users meant that gates still needed operator attention 24 hours a day, albeit through SCADAConnect. So NSID sought a higher level of automation to improve performance and manageability to deal with the unpredictable demand. With network capabilities built into the existing FlumeGates, implementing a Network Control Solution along 13 km of the main channel was a relatively simple upgrade, which included installing six additional FlumeGates.

“Rubicon's Network Control has time and time again shown consistent ability in responding to routine and extreme conditions in a complex conveyance system that challenges all canal operators.”

Justin Harter, District Manager,
Naches-Selah Irrigation District



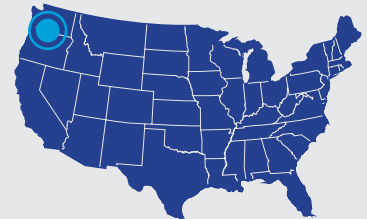
Elevated wood flume



Entrance to one of five tunnel sections along the main channel

USA

Yakima County, Washington



Customer profile

Naches-Selah Irrigation District (NSID) is a 4,500 hectare irrigation district located in the north Yakima County, adjacent to the communities of Naches and Selah, Washington. NSID manages a 120 year old system with a mix of open channel and pipe networks. NSID diverts 60 gigalitres of water per year to support over 1,700 landowners growing crops such as apples, cherries, pears and hay.

Solution components

Software



SCADAConnect



Network Visualisation



NeuroFlo

Hardware



FlumeGate



Radio Network

- FlumeGate x 13
- Radio nodes/repeaters x 1
- Level monitoring sites x 3

Managing a complex channel system

FlumeGates at regulating structures along the main channel now use NeuroFlo® control software to automatically coordinate with each other and adjust continually, providing a degree of responsiveness that remote operation by channel operators cannot match.

Network Control performs well with NSID's hydraulically complex channels because Rubicon engineers configured NeuroFlo control software to incorporate the dynamics of each pool, flume, conduit, tunnel and siphon controlled by a FlumeGate. Rubicon configured a mathematical model of the channel and then calibrated the model using data gathered by measuring the real-world behaviour of water in the channel. The result is that the FlumeGates' responses are tailored to the channel element that they are regulating. This process addresses the difficulties normally associated with automating channels with highly variable dynamics.

Now channel operators set the desired water levels along the main channel and NeuroFlo automatically ensures that they are maintained.

Results

After NSID implemented Network Control in 2012, water users immediately noticed improvements in the reliability of flows through their service points, which meant that they could irrigate more productively. Even without advance notice of withdrawals, Network Control can ensure that there is enough water in the system to meet demand and maintain desired water levels generally within ± 2.5 cm.

Channel operators no longer have to be immediately available to make regulating gate adjustments 24 hours a day in order to ensure a reliable service, which has had a significant impact on the lifestyle of NSID staff. The risk of water overtopping channel banks, pools draining and outfalls are worries of the past.



Each FlumeGate's responses are tailored to the channel they are regulating



Network Control performs well in hydraulically challenging environments



“Rubicon's Network Control solution enables NSID to operate a complex system safely. And with constant control of canal levels, we have eliminated the farms' worry of service interruptions.”

Justin Harter, District Manager,
Naches-Selah Irrigation District

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.