RUBICON™

Site Management Solution

Accurate flow measurement provides water use transparency in Chile

Situation

Junta de Vigilancia Río Elqui (JVRE) manages the supply of water from the Elqui River to 5,000 irrigators within Chile's Coquimbo region, 500 km north of Santiago. The area supports a major agricultural sector, producing grapes for export and for pisco – the Chilean national drink, along with other fruit and vegetable crops.

There is increasing conflict in many parts of Chile as local communities, mining companies, and agricultural users compete for scarce water resources. Tensions between these groups have resulted in a climate of mistrust and have seen accusations that some users were extracting more water than they were entitled to. In the Coquimbo region ongoing drought and advancing desertification has exacerbated the situation.

In this political environment, JVRE wanted to introduce greater transparency into its operations so that irrigators could see that water was being distributed equitably amongst themselves and so that other water users could see that the water resources were being responsibly managed.

To achieve this, JVRE decided to implement accurate volumetric flow measurement at key diversions from the Elqui River and make this information publicly available. Their existing flow measurement process required a field technician to travel to each site and estimate flows based on measurements taken with a water level rule.

The sites were located in remote and rugged areas, far from electricity supplies. Visiting the sites was time-consuming and posed safety risks to staff, particularly in poor weather.

In addition to improving flow measurement accuracy, frequency and safety, JVRE also wanted improved control over flows from the river into the channel systems. Infrequent manual adjustment of control gates made it difficult to ensure that extractions from the river accurately reflected irrigator water rights.

Solution

To meet these needs Rubicon implemented a Site Management Solution to manage individual sites on six of the district's main diversions. It is one of a range of solutions built from our TCC® (Total Channel Control®) technology.

The solution consisted of replacing existing control gates with FlumeGates®. The FlumeGate's reputation for reliable automated operation in harsh environments around the world made it ideal for the Elqui Valley. To enable remote monitoring and management of the FlumeGates, Rubicon installed a radio tower linked to a server running Rubicon's SCADAConnect® software in JVRE's headquarters.

> "This kind of technology for measuring flow rates in channels is essential for better management of water resources."
>
> Sergio Gahona, President of the Regional Government

Chile
Elqui Valley, Coquimbo

Customer profile

Junta de Vigilancia Río Elqui (JVRE) is a privately owned organisation which manages infrastructure and withdrawals of irrigation water from the Elqui River in Northern Chile. Water is supplied to 5,000 farmers in the Elqui Valley irrigating 23,000 hectares via 880 km of channel.

Solution components

Software

SCADAConnect

Hardware

FlumeGate

Radio Network

- FlumeGate x7
- Radio Nodes x1

Case Study

Accurate flow measurement

The FlumeGates installed at each of the six diversions provide JVRE with instantaneous flow and accumulated volume measurement. FlumeGates feature ultrasonic water level sensors which measure water levels upstream and downstream of the gate. The gate uses these measurements together with gate position information to calculate flow as it passes through the gate. This information can be viewed on each gate's display screen and also viewed remotely using Rubicon's SCADAConnect software.

Remote monitoring and management

SCADAConnect software allows JVRE operators to access each FlumeGate's flow data from a computer based at their headquarters in the city of La Serena, 100 kms away from the gate sites. SCADAConnect's open architecture enables the flow information to be shared with JVRE's public website, greatly increasing transparency.

Monitoring of the sites is simplified through the use of onscreen and SMS alerts which indicate if there are operational problems. With SCADAConnect, JVRE operators can also remotely control the gates to ensure that changes in downstream demand for water can be met quickly without making site visits.

Results

Since the solution was implemented in late 2011, accurate flow measurement information on the six river diversions has greatly increased the transparency of JVRE's operations. Anyone can now view the FlumeGates' real-time flow information on JVRE's website www.rioelqui.cl. The 1,300 irrigators on channels supplied by the diversions can be confident that they are receiving their share of water and other water users are now confident that irrigators are not receiving more than their entitlement.

In addition, JVRE and irrigators have experienced other benefits since the solution was implemented:

- Operating gates remotely means staff need to make fewer site visits and can now rapidly respond to emergencies
- Irrigators experience a more reliable supply service because flows are precisely controlled
- Because FlumeGates can only be operated with a password, the potential for unauthorised water use has greatly reduced
- The ability to deliver by volume means distribution is more equitable, in line with government policy
- SCADAConnect management software allows staff to easily add additional automated sites when required.

JVRE is now looking to expand its measurement program to include volumetric flow measurement on other diversions it manages to further improve transparency and management in the district.

An operator at JVRE's headquarters using SCADAConnect to monitor flows

Compuertas		
Aforador canal Pampa		
Caudal En Linea	236.01	Lt/Seg
Aforador El Romero		
Caudal En Linea	505.27	Lt/Seg
Aforador San Pedro Nolasco		
Caudal En Linea	326.07	Lt/Seg
Aforador canal Mainten		
Caudal En Linea	261.57	Lt/Seg
Aforador canal Miraflores		
Caudal En Linea	235.84	Lt/Seg
Aforador canal Bellavista		
Caudal En Linea	1,768.61	Lt/Seg

datos en tiempo real, ultima lectura;
09 Feb 2002 20:57 48.000

Real-time flow information for each of the diversions is publicly displayed on JVRE's website

> "This new technology brings greater transparency to resource allocation, because the exact volume of water delivered to each water right owner is now known."
>
> Jose Izquierdo, Chairman, JVRE

> "The main contribution of this project is that it will provide volumetric measurement of an important resource. In addition, it provides transparency for users with instantaneous information on water distribution..."
>
> Felipe Martin, Executive Secretary, National Irrigation Commission

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.

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