**Fen River meets efficiency and information technology objectives more quickly and at 25% of the cost of traditional modernization alternatives**

“Rubicon’s gates ensure stable water levels and consistent flows, which enable us to provide our customers with a safe, stable and flexible irrigation supply service”

Fen River Irrigation Authority

**Situation**

The Fen River Irrigation District in China’s Shanxi province consists of two reservoirs and three weirs diverting water from the Fen River into five main canals for irrigation and industrial uses. In recent years the province has faced serious water shortages resulting from drought and growing demand from domestic and industrial water users.

Built in 1950, the district’s infrastructure mainly consists of manual control gates and almost no flow measurement. The distribution efficiency of the system, which includes farm canals, is estimated to be around 45%, meaning most water is lost before it reaches farmers’ fields.

However, in recent times greatly reduced inflows have meant that the district has struggled to supply water to irrigators reliably and equitably. Shortages are now common, particularly for irrigators whose farms lie furthest downstream.

A series of central government directives requiring irrigation district modernization provided the catalyst for the Fen River Irrigation Authority to look for a solution. The Water Reform and Development Plan required districts to improve distribution efficiency through infrastructure modernization, which had traditionally involved lining canals with concrete and replacing control gates. Additionally, the Rural Water Information Transformation Plan required districts to introduce automation, flow metering and comprehensive data collection by 2020.

**Solution**

Rubicon recommended the implementation of a TCC® Network Control solution, which would involve installing FlumeGates™ on primary and secondary canals. NeuroFlo® software would automatically coordinate and control the gates to optimize the delivery of water and eliminate spills and SCADAConnect® would provide remote management and data collection.

With Rubicon’s solution Fen River would be able to achieve distribution efficiency improvements without the expense or major interruption to irrigation involved with concrete lining of its canals. Plus the FlumeGate’s integrated flow and level measurement and remote communications would meet all measurement and data collection requirements in a single device. This would provide Fen River with a low cost and simpler alternative to integrating many different automation, measurement and communications components.

Fen River immediately implemented a pilot project involving the installation of FlumeGates at two check structures and three laterals (known in China as chargepoints). These were remotely managed by a server running SCADAConnect at Fen River’s office.

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**Customer profile**

The Fen River Irrigation District in China’s Yellow River Basin is managed by the Fen River Irrigation Authority. The district covers 250,000 acres and supplies water on rotation to hundreds of thousands of small landholders growing crops that include wheat, corn and vegetables.

The district’s irrigation water is supplied to farmers via 260 miles of main canals and over 1800 miles of smaller farm canals, which are also managed by the Authority.

**Integrated solution components**

**Software**

- SCADA Connect
- NETWORK VISUALIZATION
- NEUROFLO

**Hardware**

- FlumeGate x 7
- Radio nodes x 1

**Services**

Installation, gate calibration and commissioning, operational training, and basic maintenance training
**Network Control Solution**

**Results**

The pilot project enabled Fen River to assess the costs and the benefits of the solution and work with Rubicon staff to gain a better understanding of a new way of managing their water resources. It also enabled them to trial the FlumeGate’s ability to control flows in harsh local conditions, including the very cold temperatures experienced during winter irrigations.

FlumeGates proved to be robust in these conditions and could control flows in temperatures as low as -4°F. And together with Rubicon’s SCADAConnect software, they met all of the Government’s information and communications technology requirements.

Impressed with the performance of the pilot installation, Fen River authorized the China Irrigation and Drainage Development Center (CIDDC) to assess the trial and compare the costs and benefits of implementing Network Control throughout the district with the alternative of lining canals and replacing existing gates with new manual gates.

The CIDDC report found that Network Control:
- Would provide farmers with an equitable, reliable and flexible water supply
- Could improve efficiency by up to 20%
- Could be implemented at 25% of the cost of canal lining and would enable the easy identification of high-loss areas of canal for targeted lining
- Could be deployed much more quickly than traditional canal lining and gate replacement
- Was the most effective way of reducing losses. The cost of each percentage point improvement in distribution efficiency for Network Control was 1.9 million RMB ($300 000) compared with 8.9 million RMB ($1.4 million) for lining all canals with concrete
- Should be used by other large irrigation districts to enable them to meet their modernization objectives

CIDDC concluded that Network Control should be implemented throughout the district. Fen River has now commenced installing Network Control on a 11 mile secondary canal and will follow this with the 35 mile East Main canal in 2013.

**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 have more than 10,000 gates installed in TCC systems in 10 countries.