McCROMETER
The Flow Specialists for 50 Years

The Town of Walden Responds to Changing Measurement Needs

Case Study

McCROMETER, INC. 3255 W. Stetson Ave., Hemet, CA 92545 PH 951-652-6811 FAX 951-652-3078
 Printed in U.S.A 24519-01 Rev. 1.0/10-08

Case Study

By Mark Russell
Water and Wastewater Superintendent
The Town of Walden

The Town of Walden Responds to Changing Measurement Needs

Introduction

On the way to Steamboat Springs, Colorado, The Town of Walden rests on a high glacial plain, just 20 miles from the Wyoming border in Jackson County. Situated in the center of a large open valley called North Park, the 734 residents (based on the 2000 census) of the town and the surrounding area refer to themselves as "North Parkers".

Problem

As is the case in many municipalities these days, The Town of Walden's water treatment plant needs changed over time. The town found it now had a requirement to measure finished water. The town's original pump station design did not include a flow meter. The town also had two common problems faced by municipalities when specifying and installing a retrofit flow meter for a finished water application: 1) limited real estate and space requirements and 2) a need for high accuracy flow measurement. Added to that was another common challenge for local governments—the need to minimize both installation costs and ongoing maintenance costs for any new technology solution.

Typically, traditional liquid flow meters require a minimum upstream and downstream straight pipe run in order to operate effectively and accurately. Most traditional flow meter installations require 10 to more than 40 straight pipe diameters upstream from the meter and five or more straight pipe diameters downstream. These straight pipe runs are required in order to eliminate the effects of swirl and other pipeline disturbances caused by pumps, elbows, valves and other devices that negatively affect liquid flow measurement accuracy.

Often, as in the case of The Town of Walden, the required plant real estate for a standard liquid flow measurement solution was simply not available in this system retrofit situation. The Town's existing piping configuration had no space to allow for installation of a traditional liquid flow meter given the lay length requirements and the typical upstream and downstream piping space needed to achieve the accuracy of most flow measurement devices.

McCROMETER, INC. 3255 W. Stetson Ave., Hemet, CA 92545 PH 951-652-6811 FAX 951-652-3078
 Printed in U.S.A 24519-01 Rev. 1.0/10-08

The town's engineers consulted with Canyon Systems, Inc., McCrometer's municipal representative, located in nearby Lakewood, Colorado, about a solution that would provide the best overall flow measurement. Accuracy was another important requirement in this finished water application. The engineers stressed the need for a flow meter solution that would also minimize installation costs—given their installation space constraints.

Solution

Working together, the town's engineers and Canyon Systems evaluated multiple flow measurement options suited for municipal water system applications. The McCrometer V2 System™ Municipal Flow Meter was high on the list of considered instrument options because of its high accuracy, flexible installation requirements and versatile capabilities (Fig 1). It is a differential pressure (DP) type flow meter with a design that includes a self-conditioning cone within the meter.

Figure 1. The V-2 System

This unique DP type flow meter is especially useful when irregular or crowded piping and equipment are in place because its self-conditioning cone design greatly reduces the straight pipe-run required for accurate measurement. Other flow technologies, such as orifice plate, turbine or venturi tube meters, often require complex or expensive construction in the area where the flow meter will be installed in order to install the upstream and downstream straight piping required to achieve the desired measurement accuracy.

This meter's cone design actually conditions fluid flow to provide a stable flow profile that increases accuracy. It features a centrally-located cone inside a tube (Fig 2).

Figure 2. The V-2 System's Cone

The cone interacts with the fluid flow and reshapes the velocity profile to create a lower pressure region immediately downstream.

The cone's central position in the line optimizes the velocity of the liquid flow at the point of measurement. The result is a highly stable flow profile for measurement accuracy.

Pre-packaged and ready to install, this self-conditioning DP meter features a built-in 3-way valve that isolates the transmitter from the process fluid flow for easy maintenance without shutting down the pipeline. It arrives from the factory wet-flow calibrated, eliminating

McCROMETER, INC. 3255 W. Stetson Ave., Hemet, CA 92545 PH 951-652-6811 FAX 951-652-3078
 Printed in U.S.A 24519-01 Rev. 1.0/10-08

many of the common headaches that arise when adding a flow meter to any existing installations.

The self-conditioning DP flow meter selected by the Town of Walden reduces flow meter straight pipe run requirements by up to 70 percent or more, and needs only 0-3 straight pipe diameters upstream and 0-1 downstream to operate effectively. This flow meter can be installed in close proximity to pumps in crowded plant retrofit projects by reducing the number of straight-pipe runs required by other meters. This installation flexibility results in real estate, pipe and labor cost savings that can actually exceed the cost of the instrument.

This flow meter also met the Town's accuracy needs. This flow meter operates over a wide flow range of 10:1 with low head loss and supports line sizes from 4 to greater than 18 inches. The accuracy provided by this flow meter is dependent on the line size of each application. The range of accuracy is +1% over the 10:1 turndown for between a 40 to 7500 gallon per minute liquid flow rate In addition to the installation flexibility, the Town's engineers were interested in the flow meter due to its consistent performance and low cost of ownership. The engineers liked the fact that the flow meter requires virtually no recalibration or maintenance over an exceptionally long life. This low maintenance requirement allows The Town to keep its operational costs down.

The Town's city engineers installed an eight-inch self-conditioning DP flow meter (Fig 3). To ease installation, the eight-inch flow meter was equipped with a flange connection on the inlet and a plain end connection on the outlet. These connections made it easier to mate the existing flange by Dresser sleeve piping connections.

Figure 3. V-2 System And Sleeve

Due to space limitations, the lay length of the flow meter was shortened by 13 inches from the standard lay length of 34 inches to 21 inches. The last consideration was to install the flow meter downstream of a "Y" fitting with no straight run of pipe and upstream of an ell and a valve with no straight-run of pipe (Fig 4).

Figure 4. V-2 System Installed In A Tight Fit

McCROMETER, INC. 3255 W. Stetson Ave., Hemet, CA 92545 PH 951-652-6811 FAX 951-652-3078

 Printed in U.S.A 24519-01 Rev. 1.0/10-08

Results

This self-conditioning DP flow meter was ideal for the town's water plant retrofit and finished water application. The flow meter selected and installed by the town is specifically designed to enable municipal water engineers to rely on the flow meter for consistent performance. The flow meter was just as easy to locate and install as the town anticipated that it would be.

A key benefit to the town's engineers in selecting this flow meter for their water plant application included the ability to measure finished water effluent with a high degree of accuracy. Additionally, the meter's transmitter produces 4-20 mA signal for easy integration with the plant's SCADA system (Fig 5).

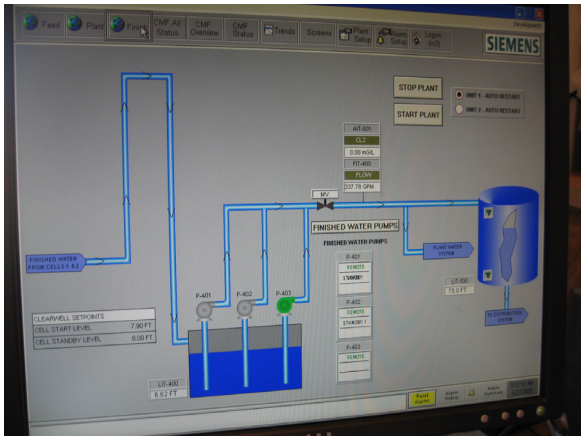

Figure 5. Walden's SCADA Unit

The completed retrofit project provides the town with better water plant process control and accounting of water usage.

McCROMETER, INC. 3255 W. Stetson Ave., Hemet, CA 92545 PH 951-652-6811 FAX 951-652-3078
 Printed in U.S.A 24519-01 Rev. 1.0/10-08