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PROCESS INSTRUMENTATION

Township water authority uses clamp-on flow meters to avoid peak limit surcharges

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A suburban township in the upper Midwest United States buys their drinking water from a major municipal water district. The township's water distribution system network has four connections to the larger municipality's water transmission main. The municipality has many wholesale customers and has implemented contracts with each customer to limit the peak flows and the time of day in which they may occur. If a customer exceeds the limit, they are assessed significant surcharges.

These potential surcharges make it essential for wholesale customers to manage water demand prudently. As a result, many customers invest in solutions to minimize usage peaks

and control what time of day they occur, including elevated water storage towers and control valves at each connection to the transmission main.

Challenge

The major municipal water district owns and operates "metering pits" with electro-magnetic flow meters (magmeters) immediately upstream of the control valves owned by each customer. However, as a rule, the signals from these meters are not made available to any customers on a real-time basis. Wholesale water customers are only provided with datalog summary reports from these meters on a routine schedule for billing purposes.



SITRANS FS230 flow meter

Without a method of measuring flow or receiving timely flow rate data from the water district, the suburban township had no means of knowing, in real time, the amount of water they were drawing from the transmission main. Therefore, they did not know if or when they were exceeding the contractual peak flowrate limits and

incurring significant surcharges from the water district until they were billed.

The township needed to determine the flowrate at each of its four connections to the transmission main so that they could control how much was being drawn at each site. They also needed to know the total flow from the municipality's transmission main so that they would not exceed their contractual peak demand.

The control valves were initially installed without flow meters. The intention was to use valve position and upstream/downstream (differential) pressure readings to estimate the flow using the characteristic curve of the valve. However, this proved to be too complicated and cumbersome for the township's SCADA system to implement effectively.

Solution

The local Siemens representative worked with the township and their engineer to find a solution to measure the flow rate and totalize the volume of flow at each of the customer's control valve sites. The most significant challenge was the piping configuration, as all of the valves were previously installed without proper spacing for a flow meter.

The Siemens representative used a Siemens clamp-on ultrasonic flow meter to demonstrate the technology to the customer and prove that it would reliably meet their objectives. The valve with the worst piping configuration was selected for the demonstration, with the assumption that if the flow meter would work for the worst site, it would work at the other three sites as well. If the Siemens flow meter did not work for that site, the township would need to consider alternate and more costly flow measurement technologies.

Within minutes of arriving on site, the meter was installed and providing reliable readings. The unit was allowed to log for a period of three days. After that, the data was retrieved and compared to the readings from a competitive magmeter in the municipal water provider's metering pit. The logger on the Siemens clamp-on flow meter helped establish and solidify the confidence of the owner and the engineer that the meter would work for these applications.

Three key reasons the customer chose Siemens flow meters:

- The Siemens flow solution has the capability to handle tough measurements and provide information on the quality of those measurements.
- The customer received attentive, professional and knowledgeable service from the local representative and Siemens personnel, including field service technicians who installed the sensors on the pipe and commissioned the transmitters.

- The local representative conducted the demonstration and assisted the township engineer in evaluating the clamp-on ultrasonic flow meter against the magmeter owned by the water district. The representative invited the major water district to a Siemens level and flow seminar, that resulted in the district supporting the Siemens clamp-on technology being used by the township.

Benefits

■ Cost savings

If the customer had been unable to use the Siemens clamp-on ultrasonic flow meters, they would have had to excavate and install a below-grade vault to house a magmeter and associated isolation and bypass valves, along with conduit and wiring, at each of the four sites. This would have required cutting the water pipe and then going through a cumbersome disinfection process, both of which would have required lengthy permitting and costly testing. Further, some of the sites had little or no room to accommodate such modifications. It was estimated that this work would have totaled over \$250,000. In comparison, the customer ended up spending \$25,000 for the clamp-on meters along with field service to install some conduit from the pipe to an existing above-grade SCADA panel.

■ Time savings

The customer had already made improvements to the distribution system and installed four new control valves. However, their construction contracts were closing and they could not use their water tower until the new flow controls were added, so time was a critical factor. The customer saved 3-6 months by using the Siemens clamp-on flow meters instead of having to construct new vaults to house magmeters.

■ Improved process reliability

Now that the meters are in place, the customer can control how much water they are taking from the water district at each of the four locations and ensure that they do not exceed their contractual peak. In addition, they can now properly manage the fill and draw of their elevated storage tank to offset peak demands, as well as during periods of low demand.

SITRANS FS230 Clamp-on Ultrasonic Flow Meter

The SITRANS FS230 is the most versatile clamp-on ultrasonic flow meter available. Because it can operate in either WideBeam or transit time mode, there is no need to change the meter when operating conditions change. This makes it suitable for virtually any liquid.

Legal Manufacturer

Siemens Industry, Inc.
100 Technology Drive
Alpharetta, GA 30005
United States of America
Telephone: +1 (800) 365-8766
usa.siemens.com/pi
Order No. PICS-00156-0721

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