

TEST METERS BEFORE JUMPING TO CONCLUSIONS ABOUT WATER LOSS

The accuracy of water meters plays an important role in every public water system in Kansas.

For systems treating water, the first meter that comes into play is the raw water meter. This meter shows the amount of water that is being pumped into the treatment facility. If that meter is not accurate, then there is no way to properly calibrate the chemical feeds to properly treat the drinking water. The flow rate is one of the main factors in making calculations to adjust chemical dosage rates. It is very important that a raw water meter is tested to ensure accuracy.

Next is the master meter that supplies the system. Many systems have multiple master meters. Sometimes these are at the points of entry where water is purchased from a neighboring city or RWD. It is absolutely critical that the master meter(s) be accurate. The master meter not only provides information for billing, it also is key to correctly determining water loss. If the operator monitors the master meter daily and records data from it, that information becomes the benchmark for understanding pumping or usage history. But the information is only as good as the accuracy of the master meter. That is why I stress to test the master meters.

And last, there are the individual residential meters. Most systems in Kansas have 5/8 x 3/4-size meters. These meters are the primary billing source for the water system. If the meters are inaccurate, then the system loses revenue.

Test the meters!

KRWA is the only organization that provides onsite meter testing in Kansas – at least that we are aware of. Testing larger master meters is not always easy.

Frequently, we find that the design and installations were made without providing test ports. When there is no test port, one has to be installed. KRWA also has the ability to do that or help do it. It would sure be nice if all designs included test ports. Installing them later is an expense – but it will be very beneficial long-term.

A portable meter tester can be used when a test port is available. KRWA has four or five such testing units. The procedure is relatively simple. We connect the test meter to a port, using a fire hose. Flow rates may have to be adjusted during the various tests. Small meters and compound meters will be tested at different flow rates.

If a test port is not available, sometimes a portable flow meter can be used to test the meter. This is a flow meter system that uses transducers that convert electrical energy into ultrasonic pulses when in a transmit cycle, and convert the ultrasonic pulses back to electrical energy. It's imperative to know the inside diameter of the piping when testing meters in this fashion.



Testing large meters is routine work by KRWA staff. Here, KRWA Tech Tony Kimmi sets up a test with Paul Strathman, Manager at Nemaha RWD 3.

This “non-intrusive” meter uses various digital processing techniques, including cross-correlation, to determine transmit times and then uses the transmit times to calculate flow velocity. KRWA has two non-intrusive test meters.

When to replace?

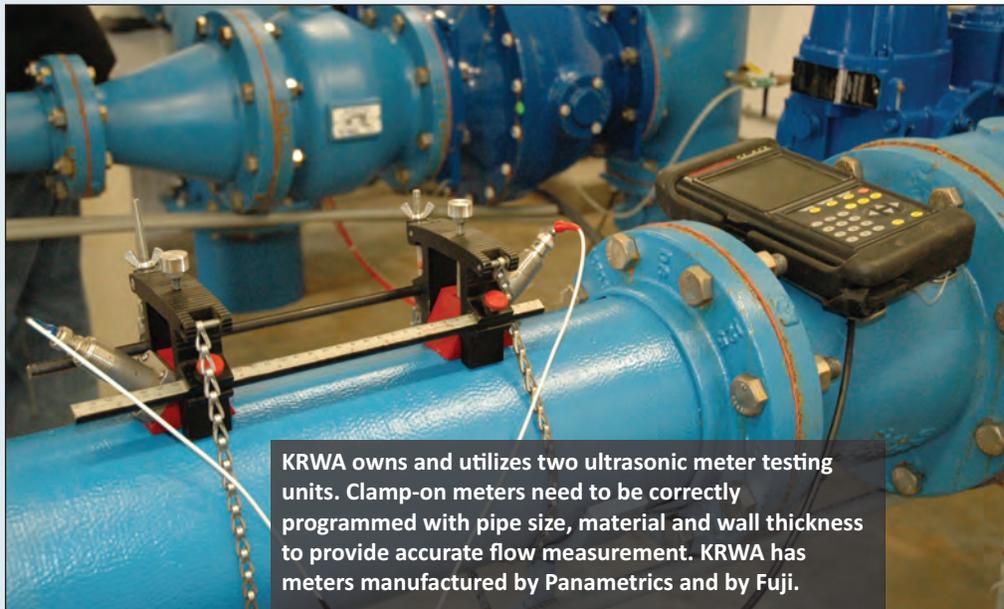
It's often suggested that a residential meter be replaced after ten years in use, or at one million gallons of use, whichever comes first. Not everyone agrees with that. While the suggestion for replacement may be a guide, I know that there are rural water districts in Kansas with customers who have up to 250,000 or more gallons of use per month! Those water systems do not change such customers' meters three times a year! Aside from use, meter accuracy is affected by water quality

and perhaps the pressure range and conditions it is operating in, etc. In other words, there's no one-size-fits-all for replacing water meters every ten years or at one million gallons. Those are parameters. Systems with aging meters should pull, say ten or so meters, and test them. Based on actual tests, informed decisions about replacing meters can be made. Without testing a sampling of the meters, no one knows how accurate or inaccurate the meters are.

Another factor in meter accuracy is the manner of installation. KRWA staff frequently find meters that are improperly plumbed. Some of these are new installations! Sometimes we find meters butted directly to an elbow or other control valve. Some meters have been installed in a vertical position. That's not correct. Generally, all meters should be installed horizontally.

To summarize, having accurate water meters is absolutely critical for sound management of a water system. Sound management includes operations – and financial. It's not fair to customers who are served through accurate meters to be subsidizing those who are served through meters that are inaccurate. It's the responsibility of the management and governing bodies to ensure that all customers are treated fairly. No more should someone allow one customer to pay, say 75 percent of the billed amount of water, than allowing another customer to only pay for 75 percent of the water being used.

I have been involved in water system operations for a relatively short time compared to some other KRWA staff. I have already seen some very good and



KRWA owns and utilizes two ultrasonic meter testing units. Clamp-on meters need to be correctly programmed with pipe size, material and wall thickness to provide accurate flow measurement. KRWA has meters manufactured by Panametrics and by Fuji.

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some very poor operations. The attitudes of people who work in systems and the governing bodies have can affect system performance. It's often in their approach. There are some fantastic improvements in metering technology. Most recently, satellite meter reading has become available. For those larger distribution systems, and especially for those that do not have SCADA systems reading meters remotely, I think this new technology would be an incredible asset. Getting a handle on water being pumped or

purchased and controlling water loss means big dollars for many systems. People operating and governing water systems should be looking at the cost of the loss and trying to do something about it when the loss exceeds a normal amount, typically anything in excess of 15 percent.

KRWA is available to provide assistance with water loss and meter testing. Please call or send an email to me at tony@krwa.net if I or anyone else can be of help.

Tony Kimmi has worked as a Tech Assistance for KRWA since October 2009. He has extensive experience in the operation of construction equipment.

He has assisted in the construction of several rechlorination stations and ongoing monitoring of water quality issues. Tony enjoys providing assistance to public water systems.



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