A few **drips** here, and a **slow leak** there...

and pretty soon we're talking about real money.

UFR Meter Coupling with Single Check and Non-Check Versions

UFR: The Solution for Slow Steady Revenue Leaks in Your Water System.

With apologies to the late-U.S. Senator Everett Dirksen for adapting his famous quote about fiscal responsibility, the concept is the same when it comes to the cumulative effect of non-revenue residential water loss.

Every community in the country has non-revenue water. In fact, many states require municipalities to make estimates of their non-revenue water – everything from what is used to put out fires, to flushing hydrants, to water main breaks, and theft – but residential losses are sneaky leaks that, for the most part, slip by with little notice.

According to research conducted by the American Water Works Association (AWWA), the largest organization of water professionals in the world, residential leaks – dripping faucets, leaky pipes, and especially water that seeps past toilet-tank flappers – account for just less than 14 percent of a home's total, indoor water use. Multiply that by the tens of thousands of homes in a community, and we're talking about millions of gallons of tax-payer financed, processed potable water that is literally going down the drain…one…slow… drip…at a time. Not good, especially when many parts of the country face serious water shortages now and into the future.

The problem is exacerbated by the fact that these leaks don't cause enough water movement to register on meters, especially after the meters age over time and become less accurate. That means homeowners might not be aware they have a leak because it's not showing up on their water bill.

"The average household can leak as much as 25,000 gallons a year and not pay for it," said Scott Knapp, vice-president of marketing for A.Y. McDonald Manufacturing Co., who offers an innovative solution.

It's called the Unmeasured Flow Reducer (UFR).

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BACKGROUND

The UFR was devised to address water-loss problems in arid regions of the world – specifically Israel – where water is costly and loss is not acceptable.

The United States is not immune to this. According to the U.S. Environmental Protection Agency (EPA), virtually every region of the country has experienced water shortages in the last five years. Even if they are not facing drought conditions, at least 36 states anticipate local, regional, or statewide water shortages by 2013.

Meanwhile, homes in this country use more than half of the processed water supplied by their municipalities, according to the EPA, which is significantly more than is used by either business or industry. For example, a family of four can use approximately 400 gallons of water every day.

With growing concerns related to water shortages coupled with the desire by communities to become more accountable and sustainable in their use of resources, the UFR was brought to this country and adapted for U.S. water systems by A.Y. McDonald. ■

The UFR is a simple way for communities to be responsible stewards of their water resources and fiscally responsible with their water revenue. You really can't hold someone accountable for waste caused by a drip or a leak if it isn't measured and nobody knows about it.

> "This isn't a new tax, this is simply charging for services that you are providing and doing it in a way that is more representative of the water being used. If you don't use a lot of water, you're not going to pay."
>
> – Scott Knapp, vice-president of marketing for A.Y. McDonald Manufacturing Co.

10 Series UFR Meter Resetter

Drawing National Attention

The City of Dubuque, Iowa – home to A.Y. McDonald Manufacturing – has included the UFR in its citywide, water-meter replacement program, called the Smarter Water project. This pilot project replaces 22,500 residential water meters, the majority of which have been in service for 20-30 years, with new, "smart" meters. The new meters, manufactured by Neptune Technology Group, transmit hourly usage data back to city offices.

This system not only eliminates the need for manual reads, but allows the city and its water customers to identify slow, previously unmeasured leaks – an ability that is enhanced by the addition of the UFR.

Since a national review states that up to 30 percent of water-service accounts have leaks, the pilot project has gained wide-spread attention. City of Dubuque Water Department Manager Bob Green has given presentations on the project before AWWA members at both state and national conferences. He points out that the new water meters are already quite accurate, but accuracy ebbs after years of use.

"Meters are still man-made and there's no guarantee that we will have one-hundred percent of our meters registering accurately all the time, today, tomorrow or in the future," Green said. "What we do know is that these UFR devices function and will assist the meter in registering low-flow usage, no matter what it is."

Before embarking on the $8.7 million project, the city hired an engineering firm to gauge the need for the switch-out program by studying 150 of the old meters. They found the older meters did not meet the low-flow minimum standard set by the AWWA, which is a quarter-gallon of water per minute.

"Then, we did a second pilot study where we took meters that were five years of age and tested those. We wanted to see if the relatively new meters were accurate," Green said. "There were enough of the newer ones that failed the accuracy test to drive us to say we needed a meter-change program."

That's when A.Y. McDonald officials approached the city about the UFR and the decision was made to include it in the citywide, switch-out program.

"Newer style meters that we're using are more accurate, but the UFR is a safety net to pick up those low-flow usages," he said. "Between the new meter and the attachment of the UFR device, it will be pretty much a guarantee that we'll be picking up all the low-flow usage and getting the most accurate reads."

Already the combined smart-meter/UFR devices are bearing fruit. There's been a 6.6-percent drop in water usage on the homes that have had their meters switched out, according to Dubuque Mayor Roy Buol.

"Dubuque is a city of 60,000. In a year's time, that's millions of gallons of water saved," he said. "You can imagine the water that can be saved in a community where you can actually show people that they have leaks. They have an incentive to fix them because they are now being charged for that water."

Apart from the revenue advantages, Buol said these devices would be invaluable for communities located in parts of the country that face water shortages.

"Every time I hear about something like that from the Southwest or Southeast, the shortage of water, I immediately think about the City of Dubuque's Smarter Water pilot, our smart water meter and the UFR we put on it," Buol said. "Over 25 percent of the water produced in the country is lost through leaks. The UFR in conjunction with our smarter meter is one way that we can show people that they have leaks in their system."

UFR Yoke Expander

EFFECT ON OLDER METERS

In June 2008, A.Y. McDonald joined with officials of the Watts Bar Utility District in Kingston, Tenn., in a pilot project to test the UFR. The group of 35 locations that were part of the test was serviced by a three-inch bulk meter. The 35 meters, each approximately four-years old, were fitted with a UFR resetter and placed back in service.

In short order, the review of hourly reads revealed 35 percent of the homes had consistent leaks. In the months following the installation, the study revealed decreases in non-revenue water:

- July – December 2008: **8.7 percent**
- January – July 2009 : **3.7 percent**
- July – December 2009: **8.1 percent**

The overall reduction in non-revenue water during the course of the study was 6.9 percent. Since that time, the Watts Bar Utility District has incorporated the UFR into its specification for new construction. ■

What is the UFR?

The Unmeasured Flow Reducer is a brass device installed in conjunction with of a water meter. Slow leaks and drips can cause up to a quarter gallon of water per minute to seep through the meter without triggering its mechanism. The UFR holds back those minute flows, allowing them to build up, and then releases them in batches, creating enough force to register on the meter.

Produced in a variety of units to match up with different residential service-line configurations means installation can be "plug-and-play." That can reduce installation costs and encourage more widespread implementation of the device.

Further, the UFR has few moving parts, which means there's less to wear out, increasing its longevity.

In Conclusion

Currently, the agencies administering water systems in the U.S. spend a great deal of money to process and manage their water supplies. In many communities, the highest power expenditure is in the processing and delivery of potable water and later, the treatment of wastewater. Combine the physical plant requirements, cost of the chemicals, machinery and staff time, and you can see that delivering safe, potable water can be a significant expense. In many communities, however, when broken down to the gallon, this safe water product is quite cheap. So, often times, a drip here and a leaky toilet there is no big deal…for now. Projections are that water shortages in this country will continue to increase in the years ahead.

"But this is really about accountability, people can use as much water as they want, but they should pay for the water they use…or let leak down the drain."

– Scott Knapp, vice-president of marketing for A.Y. McDonald Manufacturing Co.

WEBPAGES

> "Residential End Uses of Water Study (1999)"
http://www.allianceforwaterefficiency.org/residential-end-uses-of-water-study-1999.aspx

> "Water Supply and Use in the United State"
http://www.epa.gov/WaterSense/pubs/supply.html

Meter Setter with UFR Angle, Dual-Check Valve

10 Series UFR Meter Resetter