DETAILED. DETERMINED. BORDERLINE OBSESSIVE

ARB® UTILITY MANAGEMENT SYSTEMS™

In Leak Detection the Smallest Details Make the Biggest Difference

Utilities can't afford to ignore Non-Revenue Water loss. Nor can they afford to literally underestimate the problem. As utilities review better methods to conserve water and control costs, leak detection is becoming more and more important. By identifying – and then addressing – residential and commercial water leaks at the site, utilities can eliminate the guesswork and reduce costs – and just as crucial, save a precious resource: water.

While there are many AMR systems that claim to provide leak detection on the customer side of the meter, Neptune ARB® Mobile™, ARB® Hybrid™, and ARB® FixedBase™ Systems have a leg up on those technologies. That leg is the E-Coder®, Neptune's solid state absolute encoder, the "bloodhound" of leak detection. An E-Coder-based system provides the finest details that together make a difference for a utility's bottom line, including detailed resolution, detailed alerts, and detailed consumption data.

96 X 15, 24/7: A HIGHER STANDARD FOR LEAK DETECTION AT THE METER

Regardless of the Neptune System, the E-Coder remains the heart of the system, providing advanced 8-digit, high resolution data that enhances the system's value. The E-Coder provides resolution down to 1/10th of a gallon (1/100th cubic feet, 1/1000th cubic metres), identifying leaks that might otherwise be overlooked as "normal consumption" by lower resolution systems.

The E-Coder divides 24 hours into 96 15-minute intervals and monitors flow during each of those intervals. The E-Coder continually checks for consumption in each 15-minute interval, while its intelligent metrology distinguishes between intermittent and 24-hour continuous leak conditions with unprecedented precision. It also keeps track of the number of days the leak condition has existed. The E-Coder sets flags in the register to mark these leak conditions, updating the flags every 15 minutes. This level of advanced data, E-CoderPLUS data, is a valuable tool in water conservation and customer service.

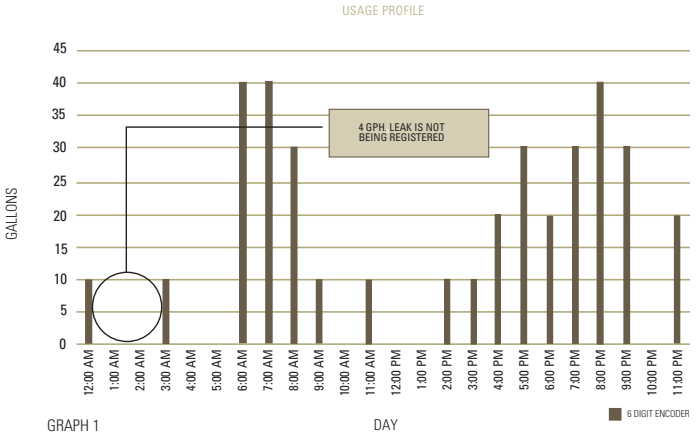
For ARB Mobile customers, Neptune's solid state E-Coder)R900*i*™ DL data logger provides a rolling 96 days of hourly meter readings. The E-Coder)R900*i* DL flags leaks and sends the data to ARB® N_SIGHT™ Mobile software, where utilities can view reports that identify not only when leaks start, but also the duration of the leak event. With this combination of ARB Mobile and the E-Coder)R900*i* DL, utilities are now experiencing "fixed-base"-level meter data with mobile meter reading technology – and realizing a higher level of leak detection than most one-way fixed network AMR systems can provide today.

Neptune's ARB FixedBase AMI System provides the most advanced level of leak detection from leak data generated by the E-Coder. When the ARB FixedBase R450™ MIU is connected to the E-Coder, the system can be configured to recognize E-CoderPLUS leak data (intermittent leak or continuous leak) as "priority alarm" conditions. When the parameters are met for one of these conditions, the system will communicate a priority alarm across the network, sending an e-mail or text message to utility personnel within minutes of the event. This kind of proactive approach not only saves time, money, and water – it saves a whole lot of headaches on the customer service side too.

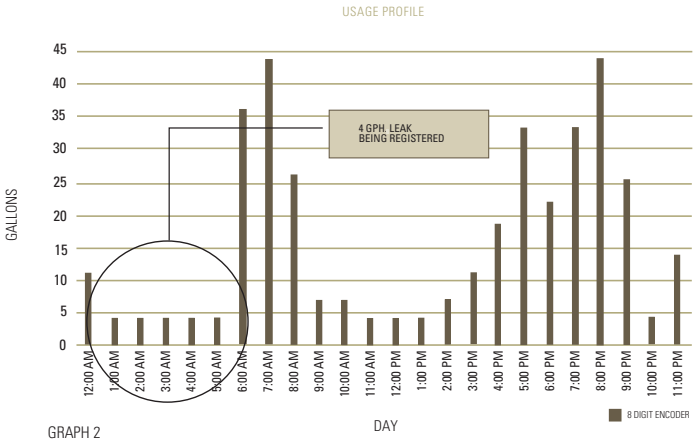
BECAUSE EVERY DROP COUNTS: LEAK DETECTION, NOT LEAK SUSPICION

A small leak may not seem like much. But if it's not caught early, it doesn't stay small. Leak detection for competitive systems is dependent on meter reading resolutions of 1 to 10 gallons from conventional 6-digit encoders that typically read the meters only two to four times per day. At best, these systems have to rely on algorithms programmed into the MIU or software analysis at the host to "infer" that a leak state existed – never really knowing whether there was a true leak.

Consumption graphs based on Neptune's E-Coder further illustrate the value of the E-Coder's 8-digit resolution. Graph 1 shows a typical residential utility service connection using a traditional 6-digit encoder with a visual registration



GRAPH 1



GRAPH 2

of 10 gallons. Graph 2 demonstrates the same residential utility service connection with E-Coder's enhanced 8-digit resolution. This residence developed a four-gallon-per-hour leak at 12:00 a.m. (See the circled area on Graph 2.) The E-Coder's 8-digit resolution not only identifies the leak but also begins to display the consumption when the leak starts. Additionally, the E-Coder sets flags for each 15-minute interval during a 24-hour period when this leak is present. With a 6-digit encoder, the leak could be masked, as this consumption would not register for three hours until the low resolution encoder incremented, and in all likelihood would appear as normal consumption.

THE DROPS ADD UP, AND SO DO THE COSTS

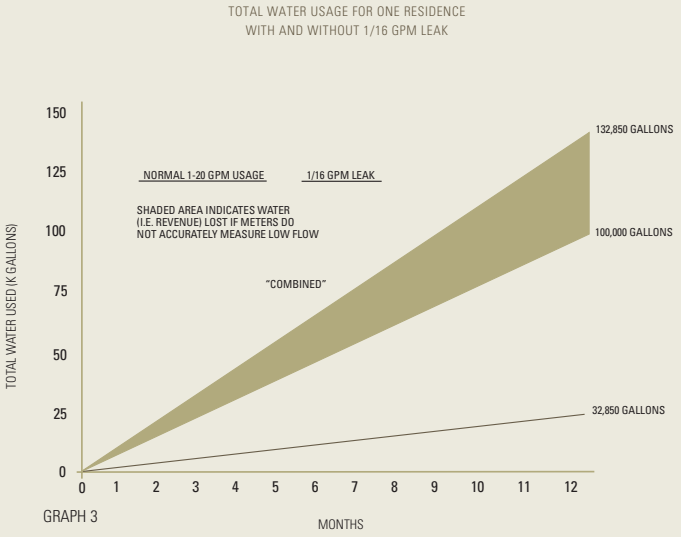
Utilities today are challenged with maintaining and managing an efficient water system in the face of revenue pressures, increasing operational costs, and manpower shortages. Controlling water loss through tighter leak detection measures has become a top priority with many utilities. Small leaks have historically gone undetected for extended periods of time, resulting in hundreds of thousands of gallons of water losses each year. Advanced high resolution leak detection at the meter is not only the best method for water conservation – it's the only method for utilities serious about managing water loss due to leaks on the customer side of the meter.

It doesn't take much to see that what a utility doesn't know *will* hurt it – especially its water supply and its bottom line. An effective leak detection program can account for potentially millions of gallons of water before it is lost.

As water conservation programs continue to grow, E-Coder-based AMR/AMI systems and their ability to detect leaks will become more and more valuable. Now utilities can take the guesswork out of leak detection and water conservation with Neptune's ARB® Utility Management Systems™.

To make a big difference for your utility, call Neptune for the details.

Studies conducted by various utilities and university cooperative extensions, such as Normal, Illinois and Colorado State University, show that dripping faucets and leaking toilets can account for as much as 14 percent of all indoor water use, equivalent to 10 gallons (38 litres) per person of water lost per day (see Graph 3). Typical annual water consumption for a household family of four is approximately 100,000 gallons. Research also indicates that many household leaks occur at less than an eighth of a gallon per minute; for example, an undetected leak at just half that – 1/16 gpm – over an entire year amounts to a water loss of 32,850 gallons. That's almost a third of that household's annual consumption.



GRAPH 3

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