

Recapturing Lost Water and Revenue

Providence Water Integrates Itron's Leak Detection Technology into Daily Operations

BACKGROUND

As the largest water utility in the State of Rhode Island, Providence Water supplies 60 percent of the state's drinking water, which includes wholesale distribution and 72,000 retail customer connections across 17 cities and towns. Renowned for its quality, Providence's water is sourced from surface water reservoirs fed by surrounding watersheds, necessitating a comprehensive management program to ensure purity and sustainability. On its website, PWSB defines its mission:

The purpose of the PWSB is to supervise, manage and control water collection, storage, purification, and distribution systems of the City of Providence, Rhode Island (the "City") and other areas within its jurisdiction; and to protect and conserve the water supply of the City and other areas within its jurisdiction.

Environmental stewardship and operational efficiency form the backbone of the water utility, which prioritizes customer engagement through education programs that help reduce water pollution and teach conservation practices. Even with distribution system water loss at 11.6 percent, which is comparatively low by national standards, the utility continually seeks to improve conservation practices and provide its customers with excellent value by improving operational efficiencies.

Its deployment of Itron's automated meter reading (AMR) technology, in 1999, was a testament to the utility's commitment to conservation and customer value. Leak detection technology that could integrate seamlessly with Itron's AMR infrastructure was a logical next step. The deployment of Itron's affordable, reliable MLOG leak sensors, paired with the mlogonline™ software application, offered the best cost-to-benefit ratio for achieving the utility's conservation, efficiency and customer engagement goals. Indeed, with the first full season of leak detection and repairs underway, hard cost savings and other less tangible benefits are only starting to be realized.



CUSTOMER

Providence Water Supply Board
Rhode Island

CHALLENGE

Achieve conservation goals
Minimize lost water and recover lost revenues
Avert costly water line ruptures

SOLUTION

Providence Water deployed Itron's MLOG and mlogonline solutions



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OPPORTUNITY

Providence Water’s distribution system includes over 950 miles of piping. To monitor the integrity of this system on any regular basis with past technology would be near impossible, which is why complete system leak surveys were historically conducted on 10-year intervals. As the customer service manager for Providence Water, Mark Ceseretti saw the results of this reactive water management strategy. All but the most obvious leaks, which sometimes surfaced as blow-outs with catastrophic consequences, went undetected for years. There was, in effect, no way to integrate leak detection and repair into a comprehensive program that could be implemented by operations.

With 11.6 percent (2.57 billion gallons) of water pumped into the distribution system ending up as non-revenue water—an annualized net cost of \$954,315—the economic benefits of leak detection and repair are readily apparent. More concerning, this cost figure does not account for the capital necessary to repair roads and to pay for property damage if and when leaks grow into catastrophic ruptures. In one such recent example, a mainline blowout underneath a state road, the final tab totaled \$45,350, excluding final road restoration costs. A leak on the same road that had been detected and repaired as part of regular operations cost \$12,967. Similarly, an emergency repair on a residential service line totaled \$5,480, compared with \$3,417 for a scheduled repair.

The economic benefit of leak detection would also be complemented by less tangible perks: as a testament to its commitment to sustainability and operational efficiency, the utility could leverage leak detection and water recovery to enhance its relationship with a diverse group of water stakeholders. Conservation could extend further into day-to-day operations as well as into the utility’s educational outreach programs. Moreover, to achieve the tenets of Providence Water’s “Green Initiative,” devised to mitigate against droughts and heavy demand, the utility would need a way to measure results.

SOLUTION

In 2010, Providence Water received American Recovery and Reinvestment Act (ARRA) funds, of which a portion would be used for leak detection technology. A key consideration in selecting a leak detection vendor was the solution’s ongoing operational costs, whether labor or continued investment in equipment. Having deployed Itron’s AMR solution in 1999, there were significant operational synergies in choosing Itron’s leak detection solution, a pairing of MLOG Radio sensors and mlogonline™ Network Leak Monitoring System. Plus, as a requisite for ARRA funding, Itron’s products met the “Buy American” provision.

Whereas competing systems in consideration required that leak sensors be moved manually and attached to different parts of the distribution infrastructure, Itron's sensors are permanently affixed to the supply side of meters, which allows operations personnel to capture leak detection data at the same time as periodic meter reads. The predictable costs of this arrangement weighed heavily in the utility's decision to choose Itron. To validate its selection, Providence Water's initial product feasibility testing showed that the technology could be easily integrated into daily operations.

Deployment of 9,400 MLOG sensors and hosted mlogonline began in March 2010 and was substantially complete by May 2012. The 2012 construction season marks the first real opportunity to act on the leak detection data and begin proactive repairs. In preparation, Kevin DiNoble, a long-time employee, was assigned to the leak detection program. As DiNoble explains, "priority one...was MLOG." Progress has been quick since then.

BENEFITS

With the leak repair program now under way in earnest, the benefits have been immediate. According to DiNoble, as of June 1, 2012 the utility is tracking 167 probable leaks. In three weeks, DiNoble's crew has investigated 72 of these probable leaks—as many as 15 per day—and created 31 work orders for repairs. Leaks have been located on copper, lead and cast iron lines and averaged about three gallons per minute (gpm). Just these initial repairs will recover more than 31 million gallons each year.

Customers served by Providence Water are responsible for water service piping after the curb stop and to the meter. In some cases, the MLOG sensors have indicated that these service lines are compromised and leaking, which means that the homeowner is responsible for repairs. By detecting these leaks remotely and then verifying in the field, the utility is able to notify customers and establish timelines for reparations.

Leak detection has not been limited to active accounts. Along with the rest of the nation, Rhode Island has suffered its share of home foreclosures, which often leaves homes vacant and unmonitored for long periods. In at least six instances so far, thieves have broken into these vacant homes to steal copper piping, only to leave the water running continuously. With 15 gpm or more of water streaming from 1-inch and 5/8-inch service lines, the waste—and the related costs—add up quickly. In a similar case, thieves broke into an old school house to steal copper piping; with a 6-inch service line dumping water into the basement unfettered, the damage was enough to warrant a visit from the fire department. Itron's leak detection solution put these and other leaks on system radar and on an operations task list.

Peripheral benefits of MLOG deployment include some unexpected finds. First, leak alerts have led to discoveries of leaks on gate valves and hydrants. Though flow estimates are difficult, the water recovered has been significant, given that this infrastructure is fed with large-diameter mains. Second, because the utility must gain access to homes to install the sensors near the meters, field technicians have had the unique opportunity to inspect meter integrity. Regulated by the Rhode Island Public Utilities Commission, the utility must demonstrate that consumers are being fairly treated; in-person inspections and manual reads mean that the utility can verify that consumption data is accurate and that bills are fair. While performing inspections, field technicians have also discovered homeowner water theft and tampering made possible with "jumper" pipes or other types of meter bypasses.

CONCLUSION

Competing priorities require utilities to constantly balance workload and resources. For Providence Water, the top two priorities are water quality and public safety; the third, at least recently, has been leak detection. Now that the utility has access to leak detection data and a trained crew to investigate and repair probable leaks, operations can better optimize its use of personnel and equipment. The utility's future savings in water production and treatment can in turn be used to fund other necessary infrastructure improvements.

Providence Water is looking forward to a future with decreased non-revenue water, increased cost recovery and revenues, more robust conservation programs and enhanced customer engagement. Best of all, the past reactive water management strategy has been supplanted by a proactive, comprehensive plan designed to systematically reduce unaccounted-for water.

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Itron is a global technology company. We build solutions that help utilities measure, monitor and manage energy and water. Our broad product portfolio includes electricity, gas, water and thermal energy measurement and control technology; communications systems; software; and professional services. With thousands of employees supporting nearly 8,000 utilities in more than 100 countries, Itron empowers utilities to responsibly and efficiently manage energy and water resources. Join us in creating a more resourceful world; start here: www.itron.com

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