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Case study

Hot Springs combats aging infrastructure challenges with Xylem digital solutions

Arkansas utility cuts non-revenue water nearly 50%

Many water pipelines in the United States were installed in the early to mid-20th Century, with some systems still relying on cast-iron pipes more than 100 years old. Aging infrastructure stands as a critical challenge in the water sector for utilities across the nation, posing significant threats to the reliability and safety of water systems.

The City of Hot Springs, Arkansas knows the challenges of dealing with aging infrastructure well. The city's 143-year-old system covers 923 miles of water mains in rocky terrain, making it difficult to detect leaks. That is why the utility's water department decided to act.

"We spend $3 million a year replacing aging infrastructure for capital improvements, making a noticeable dent over five years," said Monty Ledbetter, director of utilities at the City of Hot Springs. "Our first wise investment was the deployment of Advanced Metering Infrastructure (AMI) in 2011, which allowed us to monitor the system more efficiently."

Challenge
Address water loss due to aging infrastructure.

Solution
Combine the power of Xylem's digital solutions for advanced leak detection.

Result
Nearly cut in half non-revenue water loss from 44% to 24%.

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> “With Xylem Vue, we’re not just reacting to leaks. We’re proactively detecting them before they become major issues. This ability to pinpoint problem areas in real-time allows for substantial cost and time savings.”
>
> Monty Ledbetter, Director of Utilities, City of Hot Springs, Arkansas

Aging infrastructure is a critical issue that Xylem helps solve with remotely managed meters and advanced leak detection.

Unearth a 4 million gallon per day leak

The strategic move to AMI with the help of Xylem addressed the pressing issue of water loss due to aging infrastructure. The city replaced outdated meters with Sensus iPERL® residential water meters and implemented the FlexNet® communication network. The network provides two-way communications between the utility and its meters to transmit and bring in data seamlessly. This technology upgrade enabled real-time data collection and analysis to identify leaks, reduce water loss and optimize resource management.

“We uncovered a significant issue on a 24-inch water line during our routine leak detection efforts,” said Ledbetter. “A broken 2-inch air release valve was causing massive water loss of nearly four million gallons per day. Thanks to our advanced leak detection technology, we identified the problem quickly and stopped the leak thereby preventing further water loss.”

Hot Springs added 30 acoustic listening devices to further enhance leak detection. Sensus Analytics Acoustic Monitoring Application combines Permalog®+ technology with FlexNet to monitor distribution lines and localize leaks. Acoustic sensors use soundwaves to monitor the distribution system overnight when background noise is minimal, reporting pipeline flow conditions to the utility via FlexNet and proactive leak alerts. The utility team moves the devices monthly to maximize leak detection.

Hot Springs field technicians quickly located an issue with this 24-inch prestressed concrete pressure pipe thanks to advanced leak detection technology.

Cut non-revenue water nearly 50%

Hot Springs reduced their non-revenue water (NRW) from 44 percent to 24 percent with the use of AMI and acoustic listening devices. The advanced technology is credited for the utility’s impressive improvement–cutting its water loss close to half. The goal is to reduce NRW to 20 percent within the next year, eventually aiming for 10-12 percent within the bounds of good water management.

Virtual DMAs optimize water management

The utility continued its digital transformation with the implementation of virtual District Metering Areas (DMAs) using Xylem Vue, an integrated software and analytics platform. Inline flow meters were deployed alongside AMI to create smaller, more manageable zones within the network. This strategic approach enabled the utility to pinpoint high water loss areas with greater accuracy, optimizing their water loss reduction efforts. The initiative began on a small scale with five virtual DMAs, targeting isolated systems with one-way feeds to demonstrate the system's capabilities.

"With virtual DMAs, there is a cost-effective return on investment," said Ledbetter. "They pay for themselves by providing notifications that allow us to address leaks sooner and more efficiently."

The early success led to an accelerated three-year timeline. The next phase involves installing seven more meters for a total of 14 DMAs. The data collected flows through the communication network to the integrated software, where advanced analytics provide valuable insights.

Hot Springs monitors the analytics dashboard daily to manage accounts effectively. This capability proved crucial when monitoring specific zones. An anomaly in one zone prompted them to inspect the area after noticing a high volume of unaccounted-for water. Despite finding nothing in the first two inspections, persistence paid off on the third try when a leaking fire hydrant was discovered, losing 2,000 gallons of water per hour directly into a creek.

"Water production is costly, at $1.13 per 1,000 gallons," said Ledbetter. "With Xylem Vue, we're not just reacting to leaks. We're proactively detecting them before they become major issues. This ability to pinpoint problem areas in real-time allows for substantial cost and time savings."

Building a Water-Secure Future

As technology improves, so does Hot Springs. The utility's director is mindful of the next opportunity to enhance their service.

"Xylem's digital solutions improve our water management, make our community safer and enhance our customer service. That's what it's all about," said Ledbetter.

The analytics dashboard showed a spike in water usage within a specific zone. This data helped the utility team locate a fire hydrant spewing thousands of gallons of water directly into a creek.

The Hot Springs team uses the latest Xylem digital solutions to their advantage for improved work efficiency and enhanced customer service.

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