

Halifax Water

Drying up water leaks with the PI System



Halifax Water serves nearly 350,000 people in central Nova Scotia, delivering clean water from nine water supply plants via 1,600 kilometers of pipeline. In early 2000, rising water costs pushed water losses to the top of the company's priority list. Water loss is nearly always the result of a leaky pipe somewhere in the system. The challenge is to find the location of the leak, and to do so quickly with minimum staff time, before significant water is wasted. Halifax Water used its already installed PI System to support water leakage reduction by 40 million litres per day, saving more than C\$600,000 on an annual basis.

“We’ve developed new tools and practices to address leakage problems; the PI System is a centerpiece of those efforts.”

– Graham MacDonald, Superintendent of Technical Services, Halifax Water

Situation

Today, the Halifax Water network operates under one organization, but before a regional merger in 1996, the system was managed by three separate municipal water utilities. As part of the consolidation, Halifax Water faced the enormous task of integrating three different businesses' ways of processing, filtering, monitoring, delivering and billing for clean water. Among the first tasks was bringing a new filtration plant to the previously underserved eastern region. The new plant was completed in 1998, at substantial cost to the utility. While it improved the water quality for customers it also raised the utility's marginal cost of water.

By early 2000, water costs had become a significant issue for Halifax Water. New, higher costs for delivering water were compounded by leaky pipes throughout the eastern and western regions of the utility's territory. Now leaky pipes weren't just wasting water — they were wasting expensive water.

Identifying leaks isn't an easy task. It's data-intensive and requires monitoring of pressure and flow system-wide. But the newly-integrated utility had limited access to data. Each of the former municipal water utilities had its own solution of hardware and software systems but few of these systems talked to one another — leaving data fractured among several databases. This disconnect made water leakage control (and other company-wide mandates) even more challenging. Finding leaks was becoming a slow and costly process. The longer it took to identify, locate and fix the leaks, the more water, staff time and money was wasted.

Solution

Halifax Water began bringing the PI System online in 2001 as a central repository for all of the pressure, flow and process data from its formerly fragmented regional components. When the company shifted its attention to the problem of water loss, operators turned to the PI System to see if the existing infrastructure could help them address the new issue.

To detect leaks, operators needed a clear view of both baseline and real-time data. The PI System connected Halifax Water's many system data sources, giving operators access to a variety of data. With a rapidly accumulating volume of historical data, it was easy for Halifax Water to set expected (baseline) levels for water pressure and flow. The PI System also provides operators with needed real-time information and can flag unusual variations from baseline for the operators to review (saving them time).

Initially detecting leaks is challenging, but isolating the exact location of the leak can be onerous. Because it was easy to connect new meters to the PI System, Halifax Water was able to expand its number of District Metered Areas (DMAs), which helps operators hone in on the precise place in the system where water is being used or, in the case of leaks, lost. “Looking for water leaks is like looking for a needle in a haystack,” says Carl Yates, General Manager of Halifax Water. “The PI System helps us break that single haystack into 70 piles.”



Benefits

Breaking the haystack down into manageable, searchable units has paid off for Halifax Water. The new approach to leak management saves 40 million litres of water daily, which adds up to hundreds of thousands of dollars in annual cost savings. Halifax Water now extends detailed

leak monitoring services to its large industrial customers, as well. But efficiency gains aren't the only benefit Halifax Water has realized through its use of the PI System:

- **Water quality:** The PI System integrates water quality data from both the treatment plant and the distribution system to create system wide visibility. “We can see the turbidities and chlorine levels at the plant — and also out in the distribution system. That’s a beautiful thing,” says MacDonald.
- **System planning:** A detailed data archive allows planners and engineers to use real, accurate, data for reporting, regulatory compliance and planning issues. Planners can base recommendations on actual data—not assumptions.
- **Regulatory compliance:** Granular, accurate real-time and historical data allows for better operational planning and design to meet regulatory compliance. By demonstrating that current operating practices meet regulations, Halifax Water saves time and resources by avoiding unnecessary upgrades.

Overall, Halifax Water has realized significant savings and efficiency gains through its use of the PI System and improved the quality and scope of its services to customers. Its efforts have garnered several regional and national awards for sustainability excellence. “The PI System has changed the way we do business here,” MacDonald says.

Customer Business Challenge

- Non-interoperable systems and fractured information sharing.
- Rising water costs made system leaks vastly more expensive.
- Operators and planners often relied on estimates, rather than real data, to do their jobs.



Solution

- PI System integrates data from multiple systems.
- Real-time monitoring and alerts help quickly identify water leaks.
- Visualization tools and web parts provide role-specific data views for engineers, operators and customers.



Customer Results

- Water leakage was reduced by 40 million litres per day, saving C\$600,000 annually.
- Faster, more accurate, reporting to regulators.
- Planners can use real, historical, data to better predict future water needs.