Case study
Selangor, Malaysia

Air Selangor

Advanced analytics used to implement state-wide monitoring program to improve asset reliability and resiliency

Air Selangor is a large water distribution company owned by the Malaysian state of Selangor. The public utility serves a population of 8.4 million residents and manages over 6200 kilometers of trunk mains, ranging from 300mm up to 2200mm, with much of the pipelines located in remote areas of the state.

As a national water company making efforts to cost-effectively manage its network, Air Selangor wanted to reduce its high rate of non-revenue water loss, (NRW) which in 2017 stood at 33.3 percent.

Air Selangor had concerns about its aging infrastructure and took a proactive approach to reduce leaks and bursts and identify the causes of pressure surges to mitigate the damaging transients that could reduce the lifespan of its pipes. By identifying leaks before they become more serious bursts, repairs can be made without requiring line shutdown or without disrupting water supply to the local community..

The challenge

In the past, Air Selangor used a variety of techniques to identify leaks and bursts. However, there was still a need for a quicker response to minimize the runtime of leaks/bursts and the disruption caused. Historically, the utility faced a long runtime of leaks before discovery, often due to the remote geographical location of its trunk main network. Furthermore, pressure transients were known to be an issue within the network, but without information on their sources or causes.

Air Selangor also noticed that leaks often recurred on the same pipelines, causing concern and harming the utility's reputation. Air Selangor actively sought innovative ideas for continuous monitoring to identify leaks and pressure surges earlier, reduce NRW and improve customer relations.

The solution

Air Selangor partnered with Xylem to develop a long-term, state-wide monitoring program to improve asset reliability and resiliency. This decision intelligence approach included **Xylem Vue's Leak Detection application**, a real-time monitoring solution well suited to help Air Selangor prevent premature asset failure across the system.

Program highlights:

- State-wide monitoring program—a first of its kind in Malaysia
- Continuous remote monitoring application used to detect bursts and harmful pressure transients, reducing the runtime of leaks to days instead of months and years
- High-resolution pressure and accoustic sensors enable greater understanding about the nature and distribution of burts on the trunk mains

Leak Detection combines and analyzes analytics from two major leak detection methodologies—pressure transients and hydrophones—to help utilities localize pipe bursts within minutes and detect slowly growing leaks. This automated process, which is supervised by analysts in a 24/7 monitoring environment, simplifies the analysis, visualization and interpretation of massive quantities of data and helps repair crews prioritize their response.

Additionally, Leak Detection provides transient pressure monitoring, a non-invasive and cost-effective way to monitor water networks for the presence of damaging pressure surges. Through its inline detection of pressure transients, the solution helps determine the source of these events and identifies pipes under stress with high likelihood of leakage. This early warning helps manage damaging pressure variations and mitigate the risks associated with premature pipe failure, prolonging the effective life of infrastructure assets.

> "As a public utility, we wanted to reduce bursts and improve our customer service, and the continuous monitoring solution is certainly helping us achieve our goals..."
>
> Air Selangor

The results

The monitoring program started in 2018 with 500 sensors successfully deployed in the first year and 65 major leaks and bursts identified and repaired through close collaboration with Air Selangor. The program continues today, with ongoing installation of new sensors brought into operation daily (1,600 sensors deployed and counting*).

The Air Selangor-Xylem analytic team is identifying 2 leaks per week, with 295 found to date* and continuously monitoring for further leaks on its trunk mains, helping Air Selangor achieve its NRW targets. This compares to traditional methods where the same pipelines may not be revisited for months or years.

Data from high resolution pressure and acoustic sensors have enabled important insights into the operation of the network and the nature and distribution of leaks on the trunk mains. In addition, the transient pressure monitoring has identified operational issues related to pump changeovers, allowing Air Selangor to **implement interventions to prevent premature failure of assets across their system.**

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