xylem
Let's Solve Water

Case study
Leak and air pocket detection

Acquedotto Campano, Italy

ITALIAN UTILITY IMPROVES SYSTEM RELIABILITY AND SAVES WATER, MONEY AND ENERGY BY LOCATING WATER LOSS ON A SUBMARINE PIPELINE

Italy faces two compounding water challenges: aging infrastructure and growing water stress due to climate change. According to Utilitalia, 38 percent of water is lost on average from the country's distribution networks. By reducing these losses, the country's utilities can achieve a more sustainable water supply, lower energy demand, and better financial stewardship.

Off the coast of Naples, Italy, twin steel pipelines supply the small islands of Procida and Ischia with water from the mainland. Acquedotto Campano operates the pipelines. The utility provides drinking water to over 70 municipalities in the Campania Region in the southwestern part of the Italian peninsula.

Acquedotto Campano measured water loss on the pipelines between Procida to Ischia. About 50 liters (13 gal) of water were leaking into the surrounding sea every second. However, the utility was unable to locate the source of water loss using traditional tools.

Challenge

Two submarine pipelines constructed in the early 1950s connect Naples to the Island of Procida. Another pair of underwater pipelines connect Procida to the Island of Ischia. All four pipelines are 300 millimeters (12 in) in diameter.

The pipelines provide the primary water supply for the island's residents and the many tourists who visit in summer to experience the beaches, hot springs, and sights like Aragonese Castle.

Acquedotto Campano has collected more than 20 years of flow data, recording the amount of water produced and delivered to users. Water flows from Procida to Ischia at a rate of 260 liters per second (70 gal/s). However, the utility measured a significant loss of 50 liters per second (13 gal/s) along the pipeline.

Despite the rate of loss, locating the leak proved challenging. Acquedotto Campano tried using traditional acoustic correlators. Divers also visually inspected the submarine pipelines, which reach

PROGRAM HIGHLIGHTS

- Inspected four submarine water mains off the coast of Naples, Italy using inline leak detection technology
- Mapped one water main on the Island of Ischia
- Identified one very large leak
- Saved 50 liters of water per second (13 gal/s) by locating and repairing the leak

SERVICES PROVIDED

- SmartBall® leak and air pocket detection
- Sahara® leak and air pocket detection

Pipe Material: Steel
Inspection Length: 10 kilometers (6 mi)
Diameter: 250 and 300 millimeters (10 and 12 in)
Application: Water

depths of 30 meters (100 feet) in some places. Both methods failed to locate the source of water loss.

Accurately pinpointing and measuring the size of leaks was critical since expert divers would have to complete any repairs. The pipelines are also essential for everyday life on the islands, so they cannot be shut down for long inspections or repairs.

Solution

Working with Ena Sud srl, an Italian consulting firm specializing in water distribution networks, Xylem deployed two innovative pipeline inspection tools. Both the **SmartBall®** and **Sahara®** platforms are acoustic, inline tools that can pinpoint leaks and air pockets without disrupting service.

The inspections took place between November 2019 and February 2020. The team expected to find one or more significant leaks on the 2.7-kilometer (1.7-mi) pipelines between Procida and Ischia. They inspected the pipelines with the Sahara platform. The tool travels with the flow of water, but because it is tethered, operators can reverse it to confirm the presence and location of suspected leaks in real time. The team also visually assessed the inside of the pipeline with the tool's live video camera.

The team inspected the two 2.5-kilometer (1.6-mi) pipelines stretching from Naples to Procida with the SmartBall platform. A free-swimming tool, this platform excels at covering long inspection distances in a single deployment.

The SmartBall platform can also map pipeline networks. On the island of Ischia, the team inspected about 500 meters (0.3 mi) of a 250-millimeter (10-in) water main. Their goal was to both detect leaks and confirm the pipeline's position to inform future maintenance work.

Outcome

The Sahara platform located a burst on one of the underwater pipelines between Procida and Ischia. Ena Sud quickly deployed divers to fix the leak. With this repair, Acquedotto Campano reduced non-revenue water loss by 50 liters per second – enough to provide a daily supply of water for a third of Ischia's residents. By locating and repairing the leak, the company can now provide reliable service during the busy summer tourism season, when the island's population increases more than threefold. Reducing water loss also lowers Acquedotto Campano's energy demand and benefits their bottom line.

Inspecting the pipelines between Procida and Ischia, Italy with Xylem's Sahara platform.

"Leaking pipes and equipment, due to bursts or breaks, are a primary cause of water loss. When a leak occurs, it can take days, weeks or even months before it gets reported. In addition to that, localizing the exact area of a leak in a huge, wide-reaching network is no easy task. It is only when a loss becomes visible that we typically react. Investing upfront in a targeted leak detection program that involves inspecting, collecting and acting on assessment data is vital for efficient management. This is the biggest learning that Xylem gave us, alongside the technology to fix the issue in a timely manner."

Dario Longobardi, Owner, Ena Sud srl, Italy

puretech@xylem.com

© 2021 Xylem