

WSSC Avoids Critical Failure Through the use of Fiber Optic Monitoring

54-inch pipe replaced in Prince George's County after warning from AFO system

Challenge

As part of a comprehensive Prestressed Concrete Cylinder Pipe (PCCP) program that manages Wahington Suburban Sanitary Commission's (WSSC) 145 miles of large-diameter PCCP, WSSC and Pure Technologies have been monitoring sections of pipeline using Pure's Acoustic Fiber Optic monitoring since 2007 in order to prevent disruptive and costly pipeline failures.

Solution

In the midst of a heat wave in Suburban Washington D.C., Washington Suburban Sanitary Commission (WSSC) made a tough decision, planning to shut off water for more than 100,000 residents in Prince George's County for at least a few days.

WSSC needed to repair a 54-inch Prestressed Concrete Cylinder Pipe (PCCP) that was near failure. The decision was made after WSSC's Acoustic Fiber Optic (AFO) Monitoring system, which is installed on about 75 miles of WSSC's PCCP, identified several wire breaks in a short period of time.

PCCP is concrete pipe that's reinforced by high-strength steel wires; as wires in a pipe section snap, the pipe becomes more likely to fail. The AFO system used by WSSC identifies these wire breaks as they occur, and when the number reaches a certain limit, WSSC is advised to intervene on specific pipe sections to prevent failures.

After WSSC began experiencing major PCCP failures in the 1970s, it developed a strong commitment to infrastructure management technology in favor of large capital replacements. Beginning in 2007, WSSC and Pure Technologies began a partnership to create and Assess and Address™ PCCP management program. The program combines the early-warning system with regular condition assessment of its large-diameter pipes using inline leak detection and electromagnetic technologies.

Results

Had the pipeline failed, residents in Prince George's County would have been without water for much longer than a few days. A failure would have also been more expensive than proactively replacing a pipe section, since more excavation and restoration is required to remediate a failed pipe. Luckily, four WSSC workers were able to fix an old valve, which allowed water to be diverted to residents and prevented complete water shut off.

- The pipeline is a critical source of water for more than 100,000 residents in the Prince George's area; the decisive action from WSSC allowed a quick repair and little disruption to service
- The prevention of a failure avoided a longer shutdown time and more expensive rehabilitation project; the average cost of a pipe failure is US\$1.8 million
- WSSC's use of advanced condition assessment technologies and pipeline monitoring reaffirms their commitment to providing reliable water service for 1.8 million residents in the Montgomery and Prince George's County, Maryland (suburban Washington D.C.) area
- *"Think about River Road when that water main exploded in 2008, and there was a pouring of water going down River Road. We [didn't] want this situation to end up like that,"* said WSSC spokeswoman Lyn Riggins in a *WTOP radio* interview on July 23, 2013.