

# Force Main Management

OPTIMIZE FORCE MAIN RELIABILITY, MAXIMIZE PIPELINE LIFE, AND MINIMIZE CAPITAL COSTS WITH DATA-DRIVEN FORCE MAIN MANAGEMENT.

Today, utilities can gather high-confidence data on their force mains without significant operational effort. Condition assessment empowers utilities to plan targeted repairs, get ahead of failures, and take a more strategic approach to long-term planning.

Utilities face the difficult task of prioritizing how to spend finite capital dollars to meet the growing needs of their communities. This becomes even more challenging when the condition of buried infrastructure is largely unknown. Assessing force main condition has long proven difficult due to inspection costs, lack of redundancy, access, and technology limitations, among other challenges. As a result, utilities have reactively managed this critical infrastructure despite its high consequence of failure.

Today, utilities can leverage proven technology to assess force mains without removing them from service. Our expert engineers can help you determine which pipes require repair and which can continue operating safely. Advanced analyses inform how pipe assets are likely to degrade over time. Understanding current and forecasted degradation leads to more defensible, cost-effective force main management strategies.



About 7.5 percent of collection system assets are force mains<sup>1</sup>, which convey sanitary flows under pressure. Most force mains are comprised of metallic pipe, though nonferrous materials, particularly prestressed concrete cylinder pipe, dominate in diameters above 36 inches.

**+1,700 MILES**  
**+2,750 KM**

Of force mains assessed  
with Xylem's advanced  
technology platforms



## Benefits of a Proactive Force Main Management Program



### • **Reduced costs**

As wastewater infrastructure ages, there is an unprecedented need for capital replacement funds. However, force mains rarely deteriorate or fail systematically. Only about 4 percent of inspected pipes show signs of distress, and even fewer require repair or replacement. By identifying and addressing individual pipes with deterioration, utilities can extend the life of their critical force mains for about 5-15 percent of full replacement costs.



### • **Greater reliability**

When a force main fails, it hits a utility hard. Not only does this affect the utility financially and operationally, but force main failures also have a large impact on the community and environment. Yet nearly 75 percent of metallic force main failures and 65 percent of failures on non-metallic pipe are preventable.<sup>2</sup> Condition assessment empowers utilities to act before a pipe fails. Planned repairs are significantly less disruptive and less expensive than a failure. For unavoidable failures, optimizing system control saves time when its needed most so you can reduce damage and restore service faster.

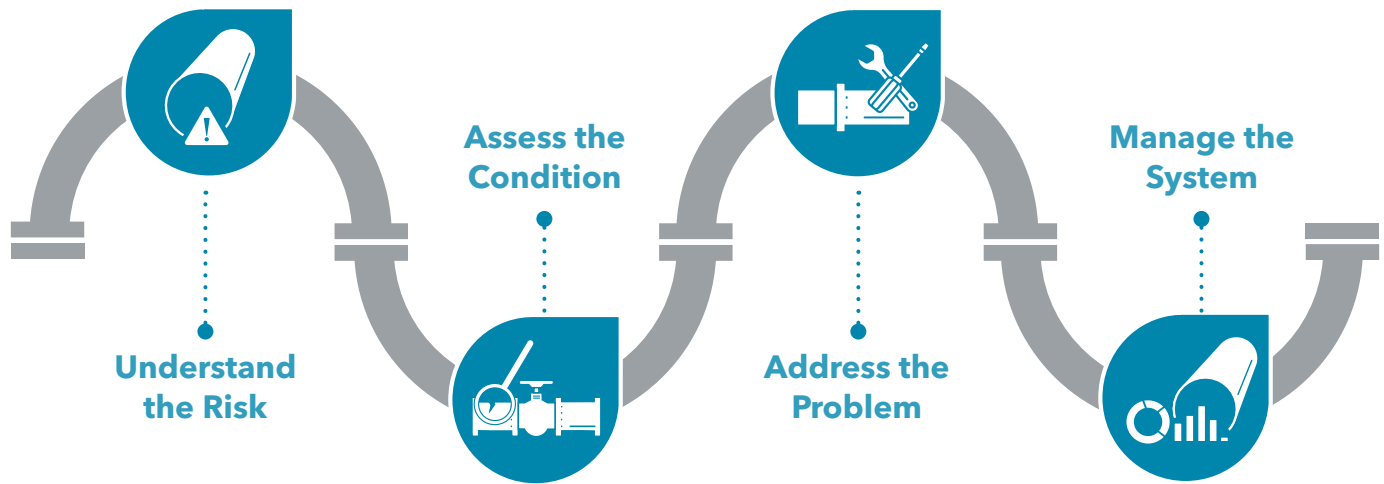


### • **Smarter planning**

Utilities are increasingly leveraging data to make confident, long-term investments in their force main infrastructure. Condition assessment quantifies risks so you can mitigate them on your schedule—investing in the right assets, at the right time. Insight into current and future risk shifts reactive maintenance to proactive planning. This approach reduces the overall cost of ownership by preventing failures, emergency repairs, and the unnecessary and disruptive replacement of force mains with remaining service life.

<sup>1</sup> Water Environment Research Foundation (2004) "An Examination of Innovative Methods Used in Inspection of Wastewater Systems (01CTS7)"

<sup>2</sup> Water Environment Research Foundation (2010) "Inspection Guidelines for Wastewater Force Mains"



## Xylem's Approach to Force Main Management

Force main failures typically result from a combination of localized threats. Xylem delivers actionable data to help you target these threats and optimize the reliability of your force main. Learn more about our proven technology and advanced analytics below.

### Risk assessment

Understanding risk is an important step in determining which force mains to inspect and which inspection techniques to use. As risk increases, so does the value of using high-resolution, comprehensive assessment methods. Inspection planning involves reviewing existing force main data, conducting a preliminary risk assessment, and identifying information gaps.

### Valve assessment

Valves are critical assets responsible for controlling flow and expelling trapped gas from force mains. Knowing the location and operating condition of valves helps utilities protect their pipeline while minimizing the consequences of a failure.

### Gas pocket inspection

Internal hydrogen sulfide corrosion is a leading cause of force main failure and starts when a gas pocket forms in the pipeline. Xylem's free-swimming **SmartBall®** platform accurately locates leaks and gas pockets in force mains of all materials. The tool is easily deployed through existing features, inspects the pipeline while in service, and covers long distances in a single deployment.



Valve condition assessment



SmartBall inline free-swimming pipeline inspection platform



## Pipe wall inspection

Xylem offers external assessment services as well as inline inspections with its **PipeDiver**® platform. This free-swimming pipeline condition assessment tool is easy to deploy and operates while the pipeline remains in service. The PipeDiver platform accurately pinpoints areas of pipe wall distress in metallic and concrete force mains using nondestructive electromagnetic technology.

## Continuous monitoring

Identify dangerous operating conditions and collect valuable data for engineering analyses with **transient pressure monitoring**. For prestressed concrete pipe, Xylem's **SoundPrint**® **AFO** monitoring system detects and locates wire breaks. This system provides pipeline owners with near-real-time data to understand pipe condition, make confident asset management decisions, and avoid catastrophic failures.

## Advanced analysis

Advanced engineering analyses transform force main condition data into actionable insights. Finite element analysis and remaining useful life analysis guide decisions about when to reinspect or repair a pipe within acceptable levels of risk. Forecasting the future condition of each pipe informs long-term planning efforts.



PipeDiver inline free-swimming pipeline inspection platform



Transient pressure monitor

For more information on data-driven pipeline management, contact us at: [puretech@xylem.com](mailto:puretech@xylem.com)



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