

**TECH
TIPS**

FROM NASSCO

FORCE MAIN AND SIPHON INSPECTION AND MAINTENANCE

By NASSCO Member Kris Embry, Co-Founder of Pressure Pipe Consulting Company

EPA CMOM, as well as local and state regulatory agencies, urge collection system inspections, and two of the more difficult assets to inspect and maintain are wastewater force mains and siphons. As our infrastructure ages, utilities are under increased pressure to maximize their resources, however inspecting and maintaining force mains and siphons have often been delayed or ignored. These pipelines are unique from gravity sewer pipelines due to their geometry, access, and material makeup and often lack of redundancy. These pressure pipes cannot be televised nor can they be jetted clean due to the aforementioned characteristics. Luckily, today there are currently more options than ever to better manage these assets. The following are some high-level technical tips.

First Step, Asset Management — Desktop study and prioritization of force mains and siphons by consequence of failure and cost of replacement is a good foundational starting point to understand the “what, when and where” for your sewer pressure pipe assets. Once you know which pressure assets you want to act on, you can start to identify the issues that are already present and/or be proactive to prevent future problems.

There is a myriad of issues that you may be facing, but for brevity I will focus on some common force main and siphon problems with operational and maintenance tips.

Complete Lack of Information: This is a surprisingly common theme. The previous lack of options and regulations compared to gravity pipelines has left many utilities behind. As mentioned earlier, the pipelines themselves are difficult to manage and you often cannot take them out of service at all. So, what are some options?

Inspect — Many levels of resolution are available with different associated costs and effort. Common inspection solutions are transient monitoring, induced transient/vibroacoustic external inspections, external surface NDT and in-line inspections. External inspections are less intrusive but yield results with limited resolution or limited reach (results only where tested).

Create Access — Most municipal pipelines do not have existing ports for in-line inspection in place. The lack of inspection ports, reduction of bore, or access to the external surface are important factors to consider when budgeting and determining feasibility. Creating a pig launch facility will not only facilitate cleaning and inspection, it can also provide a new bypass port for better operational preparedness.

Weigh your options — Pressure pipeline inspection can help asset owners better understand where pipes need to be repaired, replaced or allowed to safely remain in service. There are inspection tools that can identify where pipe defects are located and even the XYZ alignment of your pipeline. There are screening devices (usually balls) that can travel with the flow of your pipeline to the discharge while collecting leak/gas pocket/pressure/magnetic data to better inform you about the current operation and potential issues.

Loss of C-Factor — You may be experiencing a loss of C factor/pump curve which entails extra expenditure of electricity and stress on your pumps. Force mains and siphons cannot be cleaned with a jet truck, however they can be cleaned using pigging techniques.

Clean — Ice pigging (with frozen slurry) and mechanical pigging (with foam pigs) can dislodge debris, remove contaminates, and prep your pipe for in-line inspections. In a recent case study, a NASSCO member utility stated that ice pigging paid for itself within nine months. Ice pigging is far less aggressive/removes softer debris than mechanical pigging. Cleaning will extend your asset life and give you a better understanding of the health and maintenance of your assets.

Leaks/Failures — If you’ve already had leaks and failures, do you have a handle on where all of them are or which material on which they are occurring? If they have primarily been at high points, you may want to identify gas pockets and narrow your focus to those areas first.

Inspect or Rehab — You can identify leaks and gas pockets with inline devices designed to work in force mains. There is a cost benefit limit to inspection, and it may make more sense to rehabilitate your pipe with CIPP and SIPP solutions. You may be able to prioritize the high points or find additional leaks that you were not aware of.

Service ARVs — Ensuring ARVs are functional will reduce anaerobic activity and therefore corrosion. Functional ARVs also help your C factor/flow and reduce pump stress.

NASSCO is in the process of updating our Force Main Inspection Technology Matrix that can help you understand your available inspection options. Maintenance, such as cleaning with pigs, was recently a featured NASSCO Webinar with an overview and case studies. These resources can help you simplify the daunting task of managing your force main assets and can be found on NASSCO.ORG under the ‘Resources’ tab.

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