

# TECH TIPS

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TECH TIPS BY NASSCO IS A BI-MONTHLY ARTICLE ON TRENDS, BEST PRACTICES AND INDUSTRY ADVICE FROM NASSCO'S TRENCHLESS TECHNOLOGY MEMBERSHIP PROFESSIONALS.

## USING HIGH RESOLUTION COLOR SONAR IN PIPELINE INSPECTION

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A fundamental concept in wastewater asset management is improving the ability to assess performance with minimal interruption. A known advantage for inspecting semi- or fully-charged trunk-main pipelines is the utilization of a high-resolution short range sonar system enabling a facility operator to obtain real time pipeline condition information without the risks and cost of bypassing wastewater flows. Sonar inspection has proven to be a vital component for system evaluation, monitoring, maintenance, and rehabilitation with minimal system impact, and has proven to be a valuable measure in wastewater asset management.

### HISTORY

The most critical point in any wastewater collection system is the trunk system nearest to the wastewater treatment plant and/or pumping station, where system failure would be catastrophic. Thus, when asset management is applied to municipal sewers, these critical sewer lines are inspected first. Due to the high flow of these sewer lines, however, it became evident as early as 1985 that flows could not be controlled safely and effectively when performing pipeline inspection through CCTV alone. It was necessary to be able to assess the pipe under the water level of these important sewers. Unfortunately, at the time, the only "sonar" that could effectively penetrate water was large equipment used offshore in the oil industry.

The early offshore variety of sonar technology was able to make a 360-degree scan every 8 seconds, although the resolution was very poor. Engineers collaborated to design and build the first fast-scanning, high resolution sonar, specifically made to be used in sewer inspection. In 1988, the first modern high resolution color sonar to be used for CCTV pipeline inspection was born!

### SONAR TODAY

Scanning a 360-degree revolution per second for pipelines up to 18 feet in diameter, today's sonar technology enables inspection in both charged and semi-charged conditions by including the option of a mounted CCTV system for simultaneous inspection above and below the waterline, producing the results into one composite view.

The submerged sections inspected with a sonar system will not only reveal debris levels, but also indicate offset joints and other possible deformations, enabling an accurate assessment of the asset.

Today's sonar systems not only provide optional, integrated CCTV systems, but can also include inclinometers, footage counters and software system compatibility for identifying and coding defects

using NASSCO's Pipeline Assessment Certification Program (PACP) system. Typical system applications include imagery snap shots, standard screen-display information, distance measurement, pipe diameter determination tools and even compatibility for those who still use VHS systems.

### INSPECTION BASICS

The advantage of sonar inspection is that it enables us to record and monitor the operating characteristics of the pipeline system while it is in service. Information on both the existing integrity and the operating characteristics facilitates accurate planning when implementing pipeline maintenance and rehabilitation measures.

Additionally, when a pipeline system is due for rehabilitation, a current sonar inspection enables effective consideration for the repair approach and allows the facility owner to incorporate an accurate resemblance of the pipeline's condition into the bid documents, reducing the risk of costly change orders.

Often, large trunk pipeline projects are advertised for rehabilitation without any indication of debris level, resulting in undervalued bids. Unknown debris levels can result in expensive change orders, whereas a more competitive and complete bid is achieved when debris levels and pipeline condition information is properly disclosed. Sonar inspection also provides a vital method of confirmation during wet rehabilitation processes such as slip lining.

### DO YOUR HOMEWORK

Sewer system owners should become educated in sonar inspection to fully understand access requirements, reach limitations, and relative cost in order to build sonar inspection services into their respective project programs and budgets. Facility owners are also recommended to periodically reach out to industry to gather the latest on sonar technology trends, applications, and innovations.

For more information, please visit NASSCO's website at [www.nassco.org](http://www.nassco.org).