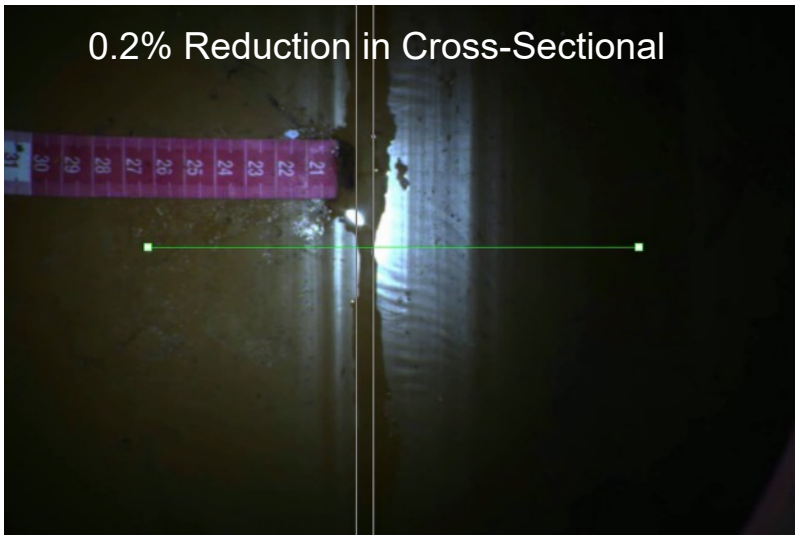


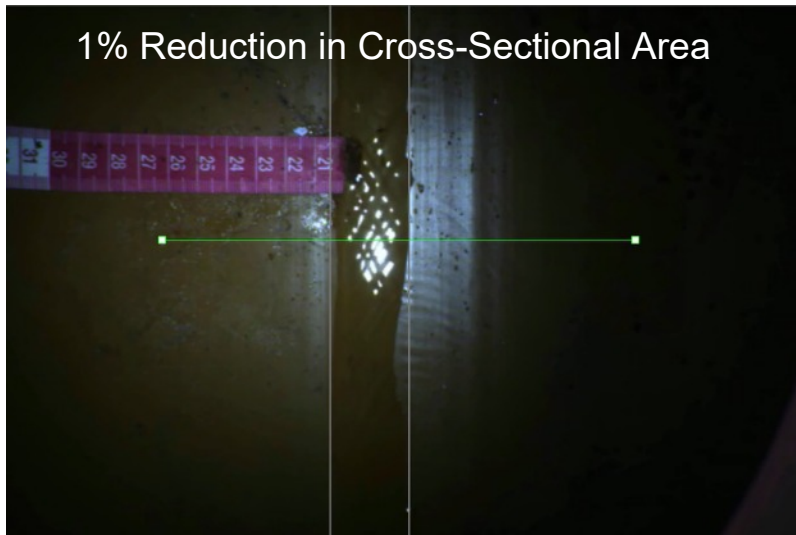
# Pipeline Camera

## The Application of Dynamic Imaging Technology to Measure and Detect Liquid Within a Natural Gas Pipeline

0.2% Reduction in Cross-Sectional



1% Reduction in Cross-Sectional Area



Liquid that builds up at the bottom of a natural gas pipeline can have many negative consequences. With liquid building up in the pipe, the cross sectional area is reduced, resulting in the pipe having a reduced throughput, leading to a loss of profit. Also, if liquids move downstream, they can damage compressors and other equipment, potentially leading to downtime. Therefore, it is critical to be able to monitor and measure any liquid that settles at the bottom of a pipe.

Traditional techniques of detecting and measuring liquid within a natural gas pipeline have limitations and challenges that create the need for a new form of measurement. For example, if you use temperature and pressure profiling to detect liquid, it is not conclusive that any of these changes are a direct result of liquid buildup. Other methods such as capacitance probes are very localized and not fully representative. The better technique is to use an imaging based system that provides visual verification of the measurement being made.



CANTY's pipeline camera is a robust option for measuring and monitoring the liquid that settles on the bottom of a natural gas pipeline. The main hardware involved with this system includes the camera, light, and vector control module (VCM).

The cameras used in every CANTY system are high resolution gigabit Ethernet CCD's that undergo significant testing to ensure they will be robust for long-term use. Optics are always improving, so CANTY is constantly evaluating the latest and greatest cameras and lenses to provide the highest quality images without compromising on quality and reliability of the system. The housing that the camera is contained in is also critical to ensuring the longevity of the system. All cameras are housed in enclosures that are explosion proof, designed to last. One of the keys to this design is CANTY's fused glass technology, which serves as the protective glass barrier that the camera optics look at the process through. Fused glass is a technology unique to CANTY that provides larger, safer views into processes.

CANTY always says that there are three keys to a perfect image: lighting, lighting, and lighting. CANTY has been leading the industry and innovating in process lighting since the 1970's and applies all of that knowledge in their camera systems. The LED light used is the brightest in the industry with a guaranteed lifetime of 5 years.

Obtaining a high quality image of a process is only half of the battle. The magic happens when that image is processed on CANTY's VCM. The VCM platform is a series of powerful processors that host the CantyVision software. These machines are configured with the camera systems at the factory prior to shipping to make obtaining an image plug-and-play out of the box. In an age of remote connections, the VCM's have the ability for users to allow CANTY personnel to remotely access the unit to provide support and help troubleshoot the analyzers. These analyzers also provide the outputs to interface the data tags with a user's control system.

In this specific application, the camera and light are combined into one system that gets mounted to the top of the pipe. The integral lighting illuminates the inside of the pipe, providing a clear, bright image for the analysis. A software algorithm measures the height of the liquid fluid from the internal wall of the pipe by looking at the contrast between them. The software can also simply detect the liquid in the pipe as the liquid will reflect a bright spot while the pipe will not. With a continuous live image, you are also able to get visual verification of the readings provided. With this system, you will be able to detect and measure the amount of liquid in your natural gas pipeline, leading to an adjustments that need to be made in order to increase throughput.

