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PRODUCT NEWS:



GOOD ACOUSTICS

InfoSense provides tools to enable a more effective and efficient condition-based maintenance strategy

By Luke Laggis

Understanding collections system condition is critical to maintaining performance. Video inspection is a key piece, but it's not the whole puzzle.

Active acoustic inspection technology, specifically the Sewer Line Rapid Assessment Tool from InfoSense, can provide a quick picture of which lines are flowing properly and which need further inspection. Most important for system operators, it does the job quickly and is inexpensive.

Municipal Sewer & Water recently spoke with Alex Churchill from InfoSense to discuss the SL-RAT and the company's new Sewer Line Data OrGanizer, or SL-DOG, platform.

MSW: How did InfoSense get its start in the industry?

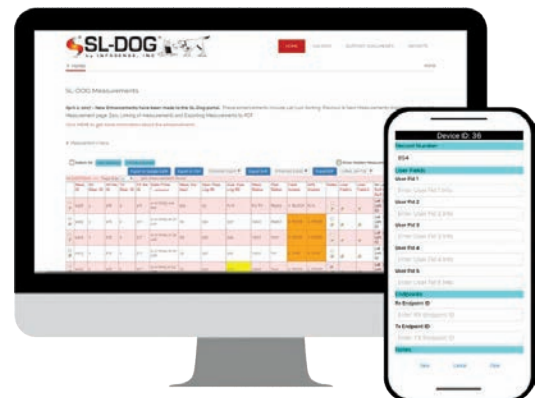
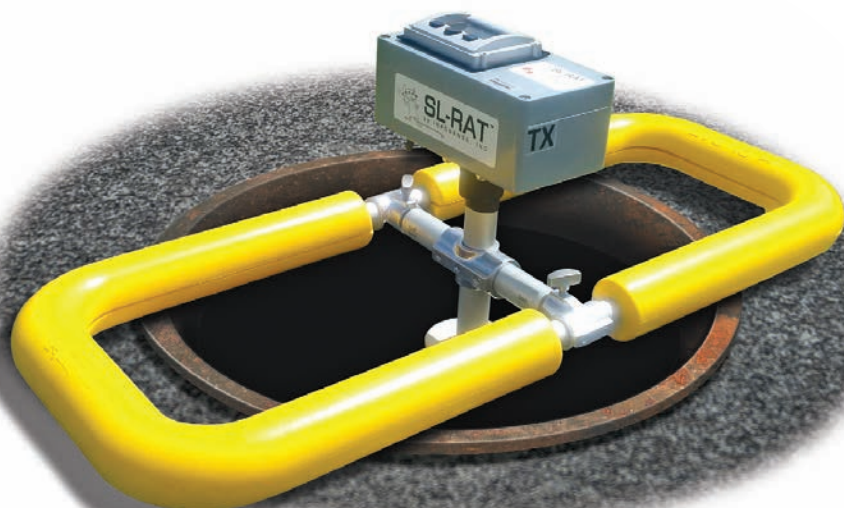
Churchill: In 2005, Ivan Howitt, Ph.D., then a faculty member at UNC Charlotte, started researching technologies to solve a problem brought



“The SL-RAT is extremely simple to use. It is on the order of 10 times faster and 10 times cheaper than CCTV or cleaning.”

Alex Churchill

forth by Charlotte Water in North Carolina. Staff members there knew their time-based cleaning program was inefficient. They wanted to move to a condition-based maintenance strategy that saved money and reduced sanitary sewer overflow risk. Howitt's extensive research led to the development of active acoustic inspection and the founding of InfoSense. The technology was patented and further developed into the Sewer Line Rapid Assessment Tool, or SL-RAT, with the help of an NSF grant, and it was awarded Water Environment Federation's Innovative Technology Award in 2012. Today, we have more than 375 utilities around the world using the SL-RAT to inspect their collections systems.



MSW: How did development of the technology evolve?

Churchill: The idea for the SL-RAT came from a problem that is now well recognized in the industry: How can utilities better understand where blockage conditions exist in their underground network, and how can they use that information to clean more efficiently and reduce risk? Howitt developed a proof of concept for using acoustic technology to screen a utility's collections system. Used as a first step in the maintenance process, he discovered this tool was significantly faster and cheaper for providing initial blockage assessments in small-diameter gravity sewers than existing inspection or cleaning tools. The city of Charlotte worked closely with Howitt to validate and improve the initial concept, inspecting more than 1 million feet with several field prototypes. Since then, hundreds of SL-RATs in the field have inspected well over 200 million feet of pipe.

MSW: What challenges have you faced in gaining acceptance of the SL-RAT's value and effectiveness?

Churchill: We experienced two primary challenges. The first was acceptance of a new technology that was vastly different in approach, appearance and operation than anything our industry had seen before. Initially, utilities needed to gain trust in this new technology. To do this, many conducted their own pilot studies to validate and understand what the acoustic scores meant for them. A formal EPA report that demonstrated the tool's cost savings and timesavings was published in 2014. Today, the SL-RAT is a trusted technology that has been widely accepted for use by regulators and insurers and as part of an ASTM standard for prioritizing sewer pipe cleaning operations, which was published in 2017.

The second challenge is the phase we are in now, which is moving to a programmatic use of the SL-RAT technology as a collections system screening tool that enables the transition from a time-based to a more effective and efficient condition-based maintenance strategy. Most utilities are using a time-based protocol for maintaining their collections systems. Shifting from a time-based approach to one that deploys resources based on condition requires adjustments in the utility operator's work management processes, which requires management effort to implement. Additionally, inspecting tens of thousands of feet of pipe per day means generating a lot of valuable data that needs to be managed, and which requires effective teamwork.

However, the transition is worth the effort. We are seeing that on average 70% or more of the pipes in most municipal systems do not need immediate attention. Utilities using the SL-RAT are able to cost-effectively assess their entire systems on a one- to three-year programmatic basis, improving awareness of the system's condition, reducing unnecessary cleaning and improving system performance.

MSW: What differentiates the SL-RAT from other inspection technology?

Churchill: The SL-RAT's patented innovation is the use of transmissive acoustics: A transmitter sits on a manhole and sends a known acoustic signal through the free space above the flow in the pipe and a receiver listens for that known signal in the adjacent manhole. Based on how damp-

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“Acoustic inspection certainly complements CCTV operations by helping to prioritize pipes that need further investment from other maintenance activity.”

Alex Churchill



InfoSense won the Water Environment Federation's Innovative Technology Award in 2012. The SL-RAT has since been employed by more than 375 utilities and has inspected well over 200 million feet of pipe.

ened or degraded the signal is, the SL-RAT uses a pattern-matching algorithm to provide a score for each test based on a scale of zero to 10, where zero is a blocked pipe and a 10 represents a pipe with significant capacity for additional flow.

The SL-RAT is extremely simple to use. It is on the order of 10 times faster and 10 times cheaper than CCTV or cleaning. The test takes only three minutes per segment and has no flow contact.

These operating characteristics make it an attractive first screening step in a collections system maintenance program and an excellent accompaniment to existing inspection and cleaning activities.

MSW: Is acoustic inspection an alternative or complement to CCTV?

Churchill: Acoustic inspection certainly complements CCTV operations by helping to prioritize pipes that need further investment from other maintenance activity. The SL-RAT is 10 to 20 times faster and 1/10 to 1/20 the operating cost of CCTV. That being said, it does not provide the same level of detail as CCTV and is focused more on blockage condition than pipe wall condition. Think of the SL-RAT providing the first-pass screening of your collections system — fast, low cost and low resolution. The information it provides helps to identify quickly where more expensive resources, such as CCTV, should be deployed, saving time and resources in the process.

MSW: How does this technology help municipal wastewater operators run their systems more efficiently?

Churchill: I'm drawn to use a quote from Greg Ramon of Little Rock (Arkansas) Water Reclamation Authority that ran in your sister magazine, Inflow & Infiltration: "I think rodding pipes every day for the sake of rodding is the old way of doing things. ... Not only is acoustic monitoring cost-

effective, but it's environmentally responsible as well. Do we really want an additional 15 trucks out there, spewing smoke and causing congestion?" Bottom line: The SL-RAT helps improve efficiency, saves money and reduces risk in your collections by focusing cleaning efforts on the right pipe at the right time. What utility director in today's environment wouldn't jump all over a solution that offers those benefits and an investment payback period of weeks or months?

MSW: The SL-DOG platform is a newer offering. Can you give us an overview?

Churchill: The SL-DOG was specifically designed to help SL-RAT users get maximum benefit from their acoustic data. SL-DOG is intended to optimize acoustic inspection programs by facilitating data collection, management and visualization. By uploading measurements to this portal, the information is archived for future access in a secure, cloud-based portal. The users can quality-control their data while enhancing and editing it, which is an essential part of complying with the ASTM standard for acoustic pipe inspection.

Additionally, the SL-DOG mobile app is a free application available for iOS or Android devices. The app helps operators add notes in the field to attribute asset IDs and other field observations to the acoustic measurements, and it automatically syncs to the portal.

MSW: Does the SL-DOG mesh with other asset management platforms?

Churchill: This is a pertinent question and one we have begun hearing more in the past few years. And that is the reason why we developed the SL-DOG ecosystem in the first place.

The SL-RAT inspection data can be easily exported into all the industry standard formats through a few clicks in the SL-DOG system. After export, the end user can re-import the file into their system of choice for further processing.



The SL-RAT provides a fast, first-pass screening of collections systems.

We recognized early on that it did not make sense to try replicating or overlapping with the excellent enterprise software packages that so many others had already developed. We wanted to develop a system that could help our wide range of customers manage their SL-RAT data, but then also export it to these other systems and use that information to automate cleaning and inspection work order processing for example. That is why we allow for the enhancement and export of the data in so many ways.

That all being said, we are working with several major solution providers to participate more tightly in their technology partner programs and we have a number of tighter integration projections we are working on with key clients. Our overall goal with this is to help our customers have a more turnkey road map and tools for data integration if they chose to go down that path.

MSW: What's next for InfoSense?

Churchill: We have a continuous improvement culture so there are constant changes being made in our processes and in our products to make them better. And we are also customer-centric so we use feedback from our customers to prioritize where we are heading.

Currently, we are focusing most of our product development resources on adding additional features and enhancements to the SL-DOG portal and to the mobile app. That's where our customers are pointing us — using the data to make decisions and

to integrate the SL-RAT program more tightly with their other business processes and systems.

MSW: Anything else you'd like to address?

Churchill: We're just excited to be a part of this industry and able to help improve the communities and environment where our technology is used. ♦



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