



Innovation never stands still. There's always a new advancement coming down the pipe. Enbridge is constantly testing commercially available technologies, and looking for opportunities to enhance existing technologies, in the areas of design, prevention, monitoring and leak detection, to keep our pipelines safe.

Our Piping Up For Technology Series, on the @enbridge blog, offers a glimpse of various research projects we're engaged in, and the efforts we're making to adapt and harness technology for safety's sake. These proactive investments in innovation are intended to add another layer of safety and security to our pipeline network – and, ultimately, to the energy transportation industry as a whole.

It's a groundbreaking research project, and it's now entered the soil of the Show-Me State.

Two years ago, Enbridge announced a joint industry partnership to begin using the External Leak Detection Experimental Research (ELDER) test apparatus, a tool designed by Enbridge to assess and validate external leak detection technologies on crude oil pipelines.

After simulating pipeline products, soil characteristics, and other environmental factors with the large-scale ELDER tool, and gleaning some invaluable test results in an Edmonton laboratory, we've taken this project outside.

Specifically, central Missouri, where we've buried fiber optic cable alongside a 20-mile (32-kilometer) stretch of our newly built Flanagan South pipeline.

"Essentially, our testing of external leak detection systems is increasing to an even larger scale with this fiber optic pilot project in Missouri," says Cam Meyn, a supervisor of testing and research in Enbridge's Leak Detection department.

"ELDER gave us some great information in a controlled environment. Other factors, like longer-term system reliability and the effects of weather, are hard to simulate," adds Meyn. "This stage of the project will give us a more complete picture. It will allow us to test the capabilities of the system to detect leaks, while also providing us with the opportunity to explore the benefits related to damage prevention.

"The two stages of the process essentially fit hand-in-glove."



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Enbridge's fiber optic leak detection pilot project in Missouri is a \$4-million endeavor, involving more than 30 Enbridge employees and contractors, with structured testing activities occurring until mid-2016.

Thanks to data collected from the ELDER project, we've shortlisted the number of third-party vendors involved, and we'll be testing both distributed temperature sensing (DTS) and distributed acoustic sensing (DAS) systems at various locations along that 20-mile segment of the Flanagan South line.

With the help of a purpose-built field leak simulator assembled by Lake Superior Consulting of Duluth, MN, we'll be using water, heat-trace and acoustic-based instrumentation in the soil to replicate leaks and test the systems' capabilities.

"We're looking for a leak detection system that can quickly and reliably identify very small leaks, and provide an accurate leak location," says Tania Rizwan, an Edmonton-based senior research engineer with Enbridge. "We hope to demonstrate its value in providing an incremental benefit to our other leak detection systems."

These systems, if proven effective through this pilot project, could provide enhanced leak detection in high-consequence areas along Enbridge's crude oil pipeline network, including areas of high urban population and environmentally sensitive areas. If broadly applied, the fiber optic infrastructure also has the potential to provide a communications backbone for SCADA (supervisory control and data acquisition) and other IT systems, as well as a means of incident prevention by detecting nearby excavation or unauthorized activity along the pipeline right-of-way.

The Flanagan South pipeline "is not a test lab. This is an operating asset, we have real-world expectations to which these systems must perform, and we will also be performing these tests with operational safety as priority No. 1," says Scott Medynski, a project manager with Enbridge.

“While it may take some time to see this technology fully tuned for real-world performance, we feel strongly about its potential to become an integral component of the leak detection system on Flanagan South.”

Watch for upcoming posts from our Piping Up For Technology series on the @enbridge blog channel.

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