NEW PIPELINE SENSOR TECHNOLOGIES

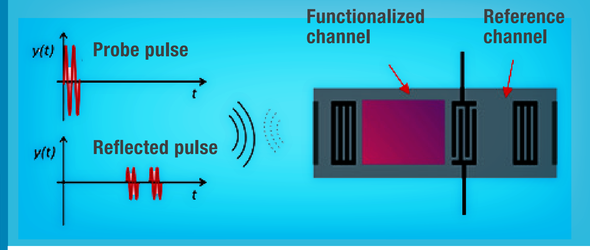
Decreasing Leakage from Natural Gas Pipelines Through In Situ Monitoring

OBJECTIVES

The goals of the project are to research and develop electrochemical, surface acoustic wave (SAW), and fiber optic sensor technology to monitor corrosion rate, gas-phase chemistry, and water content in natural gas pipelines to identify leaks and/or conditions conducive to leakage.

FWP-1022424 BUDGET

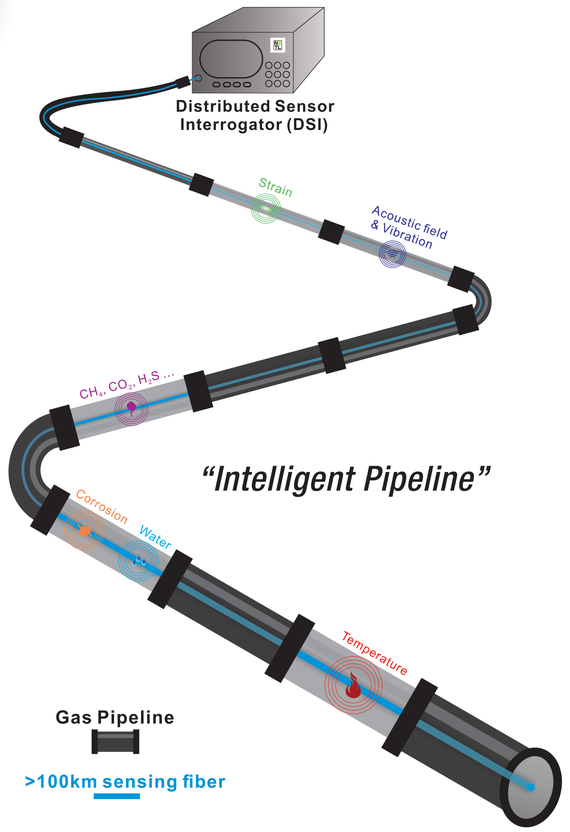
$1,100,000



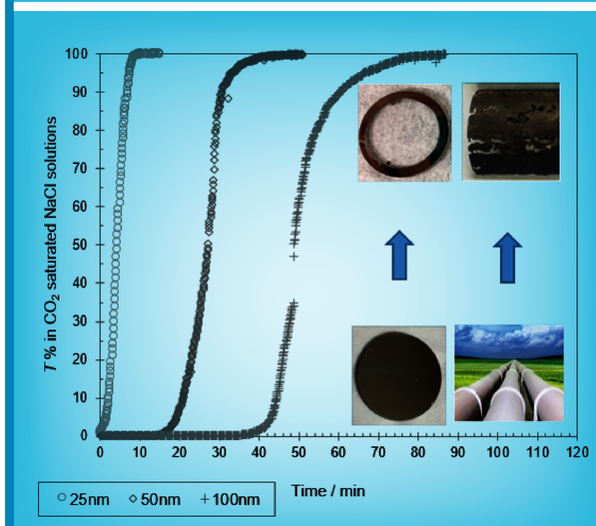
ACCOMPLISHMENTS

In FY 2017, NETL successfully fabricated a solid-state electrochemical sensor prototype, and tested for simultaneous monitoring of water content and corrosion rate of pipeline material in simulated natural gas streams under pressure.

- **SAW devices demonstrated sensitivity to both methane and carbon dioxide at ambient conditions when functionalized with metal-organic framework materials.**
- **The project also developed and demonstrated a new concept for corrosion monitoring through water condensation monitoring using an optical fiber platform.**



"Intelligent Pipeline"



IMPORTANCE

The internal corrosion can be located and quantified in situ inside the natural gas and oil pipelines, enabled by the distributed and remote monitoring capability of an optical fiber sensor network. This work represents a marked improvement on leak monitoring, and has the potential to broadly impact response and management in scenarios where a leak has occurred.

> **"Electrochemical probes are ready for early field validation in FY18!"**

CONTACT INFORMATION

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