



FOX TEK PINPOINT SYSTEM:

PRECISION, REMOTE MONITORING AND REDUCED COSTS

Oil and gas pipelines around the world are, on average, more than 28 years old. Due to the products they carry and the environment, they are subject to broad-based corrosion, pitting corrosion, cracking and bending, extreme temperature variations and other operating conditions that gradually degrade their integrity. Every pipeline operator needs a rigorous inspection and maintenance regime to ensure that products keep flowing to their customers.

With so many kilometres of pipeline in operation, pipeline managers need to target their maintenance and monitoring efforts

as accurately and efficiently as possible. Commonly used inline inspection (ILI) tools like smart pigs are effective at identifying the location of pipeline defects, but aren't equipped to monitor the defect and determine the rate of deterioration. Pipeline operators need to track the rate of degradation and then tune mitigation programs to preserve lifetime and maintain operations. Companies must routinely inspect these defects, a process that is time-consuming, expensive and subject to rigorous and costly safety regulations.

The FOX-TEK PinPoint Electrical Field Mapping (EFM) System offers five break-

through features that help clients improve their pipeline maintenance programs:

- Remote power and telemetry enabling a continuous data stream.
- Improved electronics that allow for automated operation.
- Secure electronic database with built-in analysis tools.
- Better resolution of pits and defect features.
- Removable monitoring sleeve.

The PinPoint system helps overcome the frequency and precision limitations of on-site inspections and ILI tools, and ultimately improves the efficacy of inspection and maintenance programs. By enabling these improvements, FOX-TEK PinPoint EFM reduces costs and improves pipeline safety and performance. Operators gain timely and accurate knowledge to fine tune mitigation programs or alter operating conditions.

FOX-TEK's PinPoint EFM monitoring system is comprised of three principal components: One, a clamp-on sensor sleeve with an easy-on, easy-off assembly. Two, Remote Monitoring Station (RMS) with associated telemetry, reporting and alarm systems. Three, analysis software for data processing.

The PinPoint EFM system's **sensor sleeve** features a non-welded electrode array in contact with the exterior pipeline surface. Electrodes send out a bidirectional, controlled DC excitation current to provide a dual scan of the corroded area through up to 512 differential voltage sensors, with measurement made both in parallel and diagonal to current flow.

PinPoint EFM also monitors pipe and ambient temperatures and adjusts its potential measurements in real time, so

that data can be analyzed for high-resolution monitoring of complex, internal corrosion with pitting that's invisible to other inspection techniques.

PinPoint EFM's **Remote Monitoring Stations** (RMS) can be located up to 75 metres from a sensor assembly, allowing clients to monitor more efficiently problematic sections of pipe from any location and respond before deterioration reaches critical levels.

FOX-TEK's **DMAT software** links with the RMS to provide operators with sophisticated 3-D data interpretation and analysis, with contour maps to highlight important data trends. DMAT is the final link in a data-rich monitoring system that makes PinPoint EFM the perfect complement to traditional ILI tools.

CASE STUDY: BETTER DATA, LOWER COST

An oil company in Malaysia had a problem: a 10-inch pipeline transporting hydrocarbon liquids from offshore to a gas plant was plagued by emulsification of kerosene, crude oil, tar, sand, sulphur and other liquids during the 15-kilometre journey through the pipeline. The course of the pipe line runs over varied terrain, and at a point where the pipeline reached level ground, after a steep downhill leg, these liquids settled and caused pit defects in the pipe.

The company installed a FOX-TEK PinPoint EFM system and dramatically improved their ability to tailor their inhibitor program using the continuous stream of monitoring data. The PinPoint system costs much less than one run of a smart pig through the line. Traditionally, the company would run a pig more frequently to track corrosion growth, but even with runs once per year the ability to control corrosion does not match what is being delivered by the PinPoint system.

CASE STUDY: MORE NEWS IS GOOD NEWS

An 8-inch pipeline serving a producing gas field in northwest Alberta suffered a significant decline in pressure due to a drop in output from a single well. The reduced pressure was no longer sufficient to carry produced liquids through the pipeline, so the liquids settled and corroded the pipe. The operator replaced the section of the pipeline with the most severe defect and installed FOX-TEK's PinPoint EFM to detect and monitor the location and rate of degradation, then adjusted inhibitors accordingly.

CASE STUDY: ABOVE OR BELOW THE SURFACE, SAFETY FIRST

A 3-inch line in northwest Alberta that had originally transported sour gas from a single well to a junction had been shut down for about 10 years. As part of a new production plan, the operator needed to resurrect the line to transport liquid emulsion to the main plant. To begin using the pipe again, the company needed to verify the integrity of the pipeline for the Alberta Energy and Utilities Board (EUB). A smart pig was run through the line and dozens of pits were found. The EUB gave the operator two options: either spend the money to cut out and replace damaged sections of the pipe, or monitor the pipe to ensure its safety.

The company chose the monitoring option and installed FOX-TEK's PinPoint EFM. As a result, the operator saved tens of thousands of dollars while meeting the needs of regulatory compliance and ensuring the ongoing safety of all operators, technicians and plant employees.

The above case studies clearly illustrate that FOX-TEK PinPoint is delivering benefits.

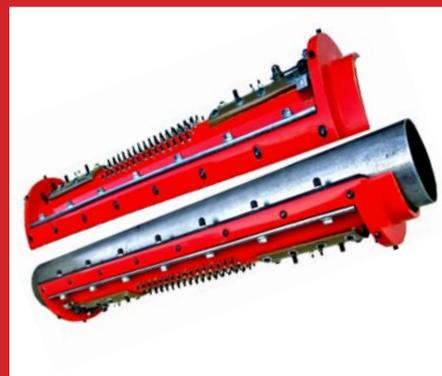
FUTURE DIRECTIONS

Plans for the future include: ✓ Sensor assemblies for larger diameter pipelines and vessels; and ✓ Interfaces to SCADA and DCS systems.

For more information, contact Gregg Van Volkenburgh, Director of Business Development, at 416-665-2288 x.238 and or visit www.fox-tek.com.



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