LEAKAGE DETECTION
REMOTE PIPELINE INSPECTION

BACKGROUND
Acoustep™ is a new, patented pipeline inspection tool, developed in the University of Manchester, which can detect and locate blockage and leakage in pipelines using acoustic techniques. The system is capable of remote application in pipelines and more complicated pipeline networks, without operator intervention. The technology has been tested in a variety of pipeline materials, including PVC and steel, with diameters up to 300 mm.

THE TECHNOLOGY
A change in cross-sectional area caused by a pipeline leakage or a blockage, gives rise to the reflection of acoustic waves. Processing the reflected signal allows analysis of the pipeline features and provides a means for pipeline inspection.

When an acoustic wave is injected into the pipeline, reflections occur at every internal feature of the pipe, including blemishes in the wall, branches in section, valves, bends, and junctions. One or more sensors are used to measure the propagation of the injected wave along the pipe and the signals are recorded. Comparison with a reference signal then enables any changes associated with a pipeline fault such as a leakage or blockage to be detected. The location of this change can be determined remotely, without access to the pipe-work.

The graph shows a typical processed signal where the first significant peak (indicated by the arrow) reveals the presence of leakage or blockage. Further analysis enables the location and severity of the pipeline fault to be determined.

Proof of principle has been established in gas pipelines and work on water pipes is underway.
KEY BENEFITS

- Simple and cost effective pipeline monitoring and inspection tool
- Detects and locates leakages and blockages in real time
- Offers a continuous monitoring capability
- The system can be integrated into existing pipeline test equipment
- Applicable to simple and complex pipelines and networks
- Effective in commonly found pipeline materials

APPLICATIONS

Continuous monitoring and/or inspection of:
- Oil pipeline systems
- Water pipeline systems
- Gas pipeline systems
- Industrial plants
- Detection of “PIGs”

INTELLECTUAL PROPERTY

Patent applied for.

OPPORTUNITY

Of interest to process and engineering companies to:

- Develop and ruggedise the system to meet oil and gas industry standards
- Undertake field trials
- Produce a commercial system

CONTACT

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