

Developments in Remote Magnetic Monitoring of carbon steel pipelines to locate and Measure Abnormal Stress.

Hamed Habibi,
MSc, MME, Technical Director, Speir Hunter
Mayden House, Main Street
Long Bennington, Newark
NG23 5DJ, UK

Abstract

Conventional pipeline integrity solutions quantify the defect geometry in a pipeline wall, relying, for example on the identification of a defect category (crack, or corrosion) and its size (wall thickness loss). However, the most important dimension for integrity decision-making concerns the underlying quantity of stress. Defect geometry is often used to infer the stress-value in a pipeline. Once this stress-value reaches the pipeline maximum material strength it causes plastic deformation and rupture of the pipe. Large Standoff Magnetometry (LSM) is an innovative form of Remote Magnetic Monitoring (RMM) technology that provides direct measurements of stress quantities in pipeline wall material through the analysis of pipeline magnetic data. This paper explains the basic principles of LSM through the example of a leading LSM technology, SCT (Stress Concentration Tomography). It will then present verification data summarising the effectiveness of SCT based on data collected in the field.

Keywords: RMM, LSM, SCT, SCZ, Localised Stress, Stress Monitoring, Condition Assessment, Pipeline Integrity.