

Magnetic Flux Leakage (MFL) Capsule material selection and its robustness analysis in oil and gas pipeline

Abstract

This paper discussed on the material selection and its robustness analysis towards the design of magnetic flux leakage capsule that most applied in oil and gas pipeline. Magnetic Flux Leakage is among the most famous and expensive technique in large scale oil and gas pipe diagnosis system. This technique applies strong magnetic fields to detect any strange in the inner surface of the pipes such as corrosion, crack or other symptoms which is bad to the pipe condition. The aim of this research is to study and develop a small scale, low cost and portable Magnetic Flux Leakage diagnosis system which suitable in detecting the defect in the inner side of steel pipe or steel tank structures. This system uses strong permanent magnet to generate strong magnetic field while Hall Effect sensor act as a receiver. It is found that the best suitable material for the Magnetic Flux Leakage Capsule is carbon steel.

Keywords

Magnetic flux leakage; Material selection; Robustness analysis