

Pulsed Eddy Current Signal Analysis in the Insulated Pipe using Machine Learning

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Pulsed eddy current (PEC) is promising technology to monitor the local wall thinning such as corrosion under insulation (CUI) and flaw accelerated corrosion (FAC). The purpose of this study is to develop the new technology which identify these defects without removing the insulation. The actual thickness of the test piece was measured using an Olympus ultrasonic equipment. The specimens were machined with A106 Gr-B pipe length of 1500 mm and a thickness of 12.85 mm, with step. To identify the step difference from PEC signal machine learning methods such as principle component analysis (PCA), and support vector machine (SVM) technology were applied. PCA and SVM gives more insight for feature extraction and compared for classification results obtained from PEC experiment. The wall thinned pipe covered with insulation are used for classification. The results of PEC defects classification were extracted from newly developed PEC equipment. The analytical show that the proposed methods have great potential for in-situ defect inspection of pipeline covered with insulation.