

Enhancing Performance for Magnetic Flux Leakage Inspection of Storage Tanks

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Magnetic Flux Leakage (MFL) technology is a robust and cost-effective approach for the inspection of storage tank floors. The primary advantage of the MFL approach is its ability to locate and estimate the size of discontinuities over large areas in a quick and efficient manner. While characteristics of MFL signals have been reported to correlate to the volumetric loss of defects, these observations are normally related to defects with similar profiles that grow proportionally. However, defects with different profiles can have corresponding MFL signals with similar amplitudes creating ambiguity. This is a consequence of the limited bandwidth of MFL signals. To help classify defects and improve their sizing accuracy, a collection of complementary sensors and virtual analysis tools are available to assist the inspector to formulate a repair strategy. For example, one route to improve sizing accuracy is to determine first whether a defect comes from the top side or bottom side of the steel floor. The patented STARS approach developed by Eddyfi Technologies is a solid-state sensing system that can measure top-side defects, which not only helps with identifying the source of corrosion but also improves the accuracy of defect size estimation from MFL signals by utilising appropriate top side/bottom side calibration profiles. This paper describes advanced high-resolution MFL, the impact of MFL bandwidth limitations, STARS technology and defect classification to achieve consistent and reliable inspections of storage tank floors. Keywords: Magnetif flux leakage, tank inspection, STARS technology