innospection
A DIVISION OF SONOMATIC LTD.

SONOMATIC

SUCCESS STORY

PIPING INSPECTION USING MEC™

THE PURPOSE

This document is composed to assist our clients and the supply chain to better understand our capabilities and experience within the topside NDT sector.

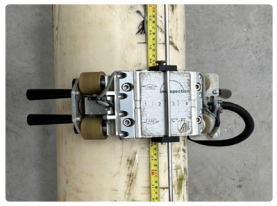
PIPING INSPECTION USING MEC™

Within a client's refinery, they were experiencing small and isolated MIC (Microbiological Induced Corrosion) pipe failures, leading to random losses in their product containment. These pipe defects were occurring internally and mainly within an identified 6"OD x 7.15mm wall thickness, Carbon Steel COSC transit pipeline, with an applied non-electro-conductive painted coating.

Multiple attempts had been made by the client, to locate and plot these small defects especially with manual Ultrasonics, well in advance of any failures occurring and at their preliminary stages of propagation, but with little to no success.

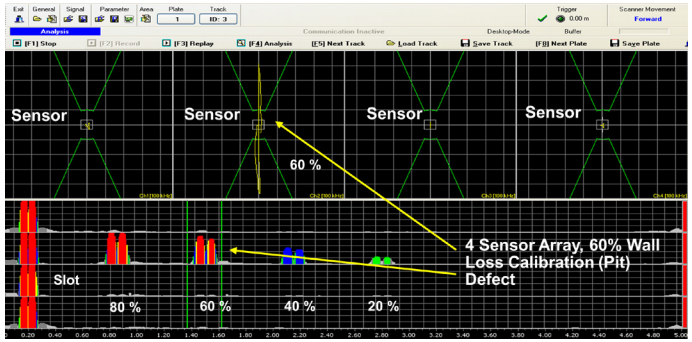
PROCESS

An inspection campaign was established and completed using a variety of Innospections MEC™ topside (permanent magnetic and electro-magnetic) dedicated pipe scanners, as seen below. These scanners built for different applications, in terms of both the available pipework access, outside pipe diameter and the wall thicknesses.

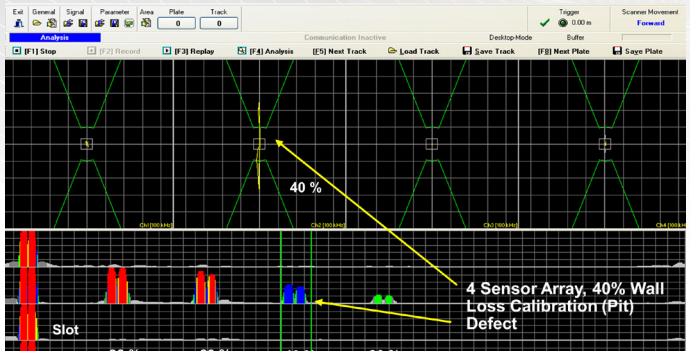


MEC™ Eddy Current is a reference NDT inspection technique; therefore, a calibration is always required of the complete system from a known "like for like" (material and pipe specification) reference test-sample. This sample containing either natural and/or artificial material defects, similar in the nature and shape to those defects being sought, and for a reference (impedance signal) response. Seen below are the actual responses observed from artificial 20%, 40% & 60% internal pipe wall pits.

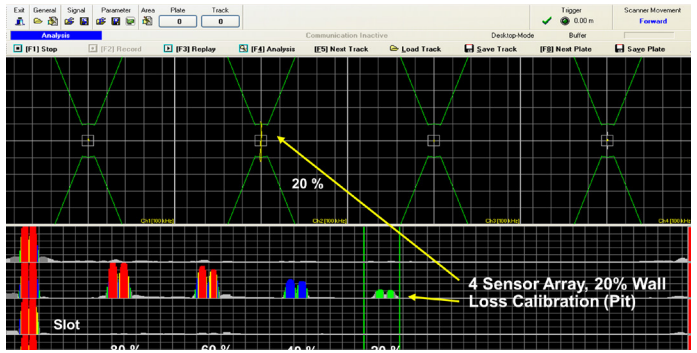
CALIBRATION REFERENCE SCAN ON 60% WALL LOSS ARTIFICIAL PIT



CALIBRATION REFERENCE SCAN ON 40% WALL LOSS ARTIFICIAL PIT



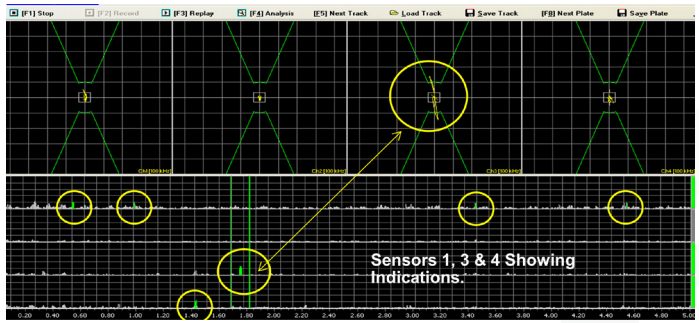
CALIBRATION REFERENCE SCAN ON 20% WALL LOSS ARTIFICIAL PIT



OUTCOME

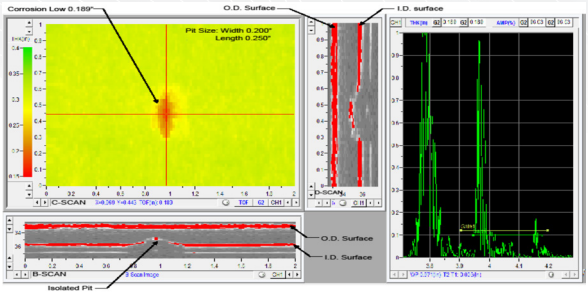
After intense surface scanning over multiple areas or the pipework, equating to a significant total meterage and nothing being detected, an area of pipeline was finally located with notable random indications being resolved, as seen along the scan tracks below.

ACTUAL PIPELINE 5M SCAN TRACK WITH INDICATIONS OBSERVED

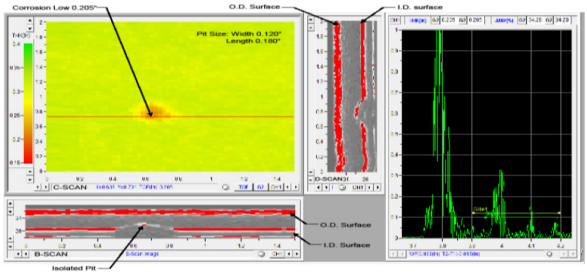


These areas with random isolated indications being discovered, were then subjected to further intense high resolution slower automated ultrasonic scanning, revealing, and confirming internal pitting and their sizes of which a sample is shown below.

F3 HIGH RESOLUTION SCAN SHOWING CORROSION



F4 HIGH RESOLUTION SCAN SHOWING CORROSION



For note these two particular internal isolated pits shown, were confirmed, and measured out at 5mm x 6mm and at a depth of 25% wall loss, and 3mm x 4.5mm at a depth of 20% wall loss, respectively.

Both these areas had been missed previously, by a routine manual Ultrasonic inspection.

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