

HOMC APPLICATION NOTE-5

Corrosion Assessment Under Scabbing

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Corrosion scabs, blisters always pose a threat to owners and operators monitoring asset integrity and remaining life. The corroded section can be hard to estimate and scab removal very often potentially hazardous, making determination of corrosion under the scab or blister very important for mitigation work.

Challenges to Estimating the Deepest Wall Loss under Scabbing Corrosion.

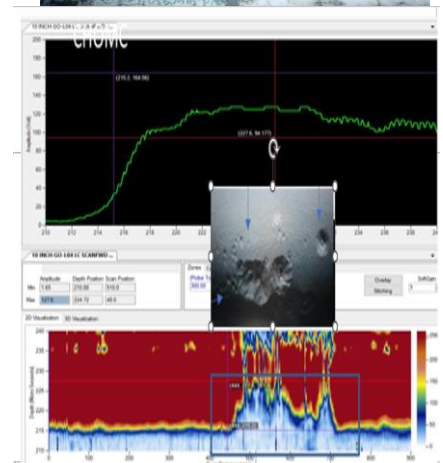
There are various Inspection methods to inspect Corrosion Under Scabbing. These include visual assessment and pit gauging, ultrasonic mapping and laser scanning, or digital radiography and pulsed eddy current. Each have their own merits and demerits. The main challenge comes from the scab corrosion material itself. Without removing the scab, visual inspection, ultrasonic testing (UT) and laser scanning are unable to assess the structural damage of the component hidden under corrosion.

Scab removal is a hazardous exercise, especially for an in-service component that could potentially be concealing a leak and to avoid further damage. Digital Radiography is good for small diameter pipes < 6inch) while Pulsed Eddy Current offers a fair amount of decent data and thickness determination with new design probes and software,

Despite all these the probability of missing a smaller localized defect on a larger corrosion makes sizing crucial for making maintenance decisions.

HOMC Guided Waves as Reliable Solution

The Higher Order Mode Cluster (HOMC) Ultrasonic Guided waves can be deployed axially in through transmission mode (AHOMC-TT) for pipes with access to the region of interest such as elevated pipes, elbows etc. Pipes with no access to the bottom or closely spaced pipes can be inspected from the top with probes at 2 and 10 'o' clock positions Circumferential HOMC in TT Mode (CHOMC). Not only the depth of wall loss but the profile of corrosion is also determined with extreme high sensitivity to the deepest wall loss. The sizing accuracy is in the range of 20-80% Wall loss. It can be deployed from 2 inches and above pipe sizes



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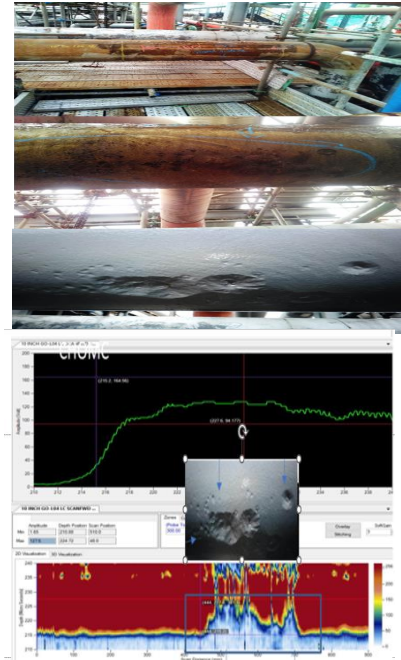


HOMC INSPECTION of 10 inch pipe with Scabbing

A 10inch hydrocarbon at a refinery with scabbing corrosion was inspected with HOMC to assess severity as the client wanted to determine the severity of corrosion prior to blasting and doing necessary maintenance to contain the corrosion.

Through Transmission CHOMC was carried out and the corrosion profile and depth was determined.

Subsequent blasting and maintenance done during an outage revealed a close correlation in defect profile and sizing estimates. The ability to size small localized corrosion on larger general corrosion was very useful to determine the risk levels under scabbing and to suitably plan further maintenance actions



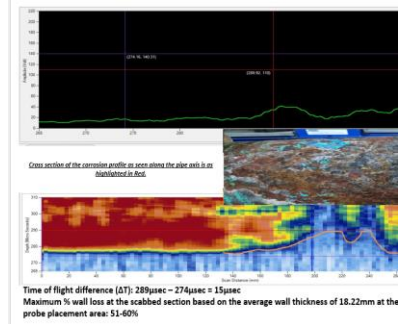
HOMC INSPECTION of Scabbing with a welded guide

A 12inch pipe with scabbing and a welded support guide provided some challenge to determine the deepest corrosion point by Pulsed Eddy Current to the client at support region due to interference efforts. Initial Pulsed Eddy Current done revealed a wall loss of around 30% Wall loss. HOMC was also done at site and revealed a wall loss of 51-60%. The pipe was subsequently replaced and the cut sample was brought back for further evaluation.

Without interference from the welded support in the cut sample, Pulsed Eddy Current sized the defect as 54.5% Wall loss with a High Resolution Scabbing Probe.

Ultrasonic Grid mapping done from the pipe internal revealed a wall loss of 55.3%.

The accuracy of HOMC under these circumstances in situ, provided the confidence to be able to determine reliably corrosion under scabbing.



HOMC
RELIABLE- PRECISE -ACCURATE
FOR CORROSION ASSESSMENT UNDER COMPOSITE SLEEVES