

HOMC APPLICATION NOTE-4

Corrosion Assessment Under Composite Sleeves



Corrosion Assessment Under Composite Repair Sleeves

Over recent years there has been an increasing trend towards the use of composite repairs on piping along the free length and at support regions with corrosion damage..

This has brought benefits in terms of ease of repair, improved integrity and reduced downtime. However, the risks associated with the application of such repairs have not always been well understood or correctly evaluated.

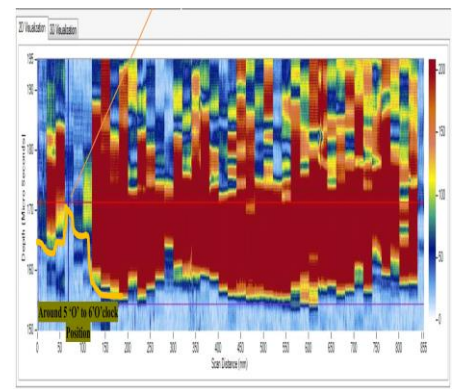
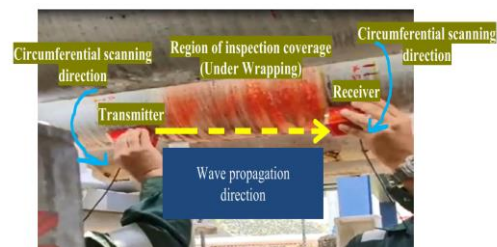
While the majority of repairs have been successful, there have also been failures. These have been attributable to a range of factors including poor installation practices, deficient design, inadequate specification and use in unsuitable applications.

Challenges to Composite Repair Sleeves

The main challenge to such inspection which has various techniques that can be applied is the ability to access all sections of the pipe to do a 100% assessment especially if pipes are resting close to the ground and corrosion is at the bottom. The integrity of the sleeve is also subject to the extent of corrosion happening under the sleeve Post repair and the need for monitoring them is important

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



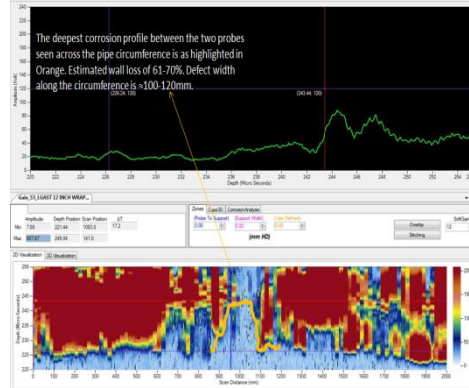
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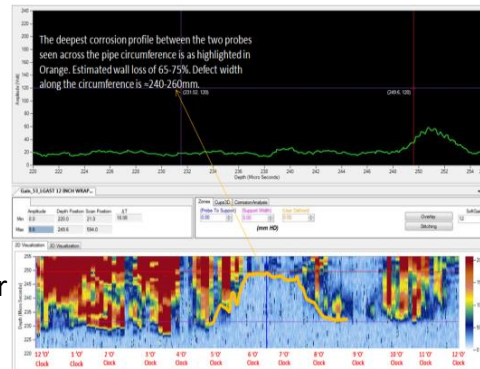
HOMC INSPECTION of 12 inch Wrapped Pipe - 1

A 12inch hydrocarbon Line at a Terminal was repaired with a planned replacement of the repaired section scheduled over a specific window. There was an existing wall loss of around 65-70% of the nominal wall thickness seen earlier leading to the repair. When a delay to the replacement of the section happened, the integrity of the pipe under the repaired composite wrap section was to be done to allow for continued operation. The original measurements taken before repair was compared with HOMC estimates of the corrosion profile and wall loss determined and the inspection confirmed the exact location of the corrosion and also the depth of wall loss which was not found to be different then determined before the repair to allow the client to make an estimate of existing condition of the pipe and thereby to allow for further continued service.



HOMC INSPECTION of 12 inch Wrapped Pipe - 2

A 12inch hydrocarbon Line at a Terminal was repaired with a planned replacement of the repaired section scheduled over a specific window. There was an existing wall loss of around 65-70% of the nominal wall thickness seen earlier leading to the repair. When a delay to the replacement of the section happened, the integrity of the pipe under the repaired composite wrap section was to be done to allow for continued operation. The original measurements taken before repair was compared with HOMC estimates of the corrosion profile and wall loss determined and the inspection confirmed the exact location of the corrosion and also the depth of wall loss which was not found to be different then determined before the repair to allow the client to make an estimate of existing condition of the pipe and thereby to allow for further continued service.



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RELIABLE- PRECISE -ACCURATE

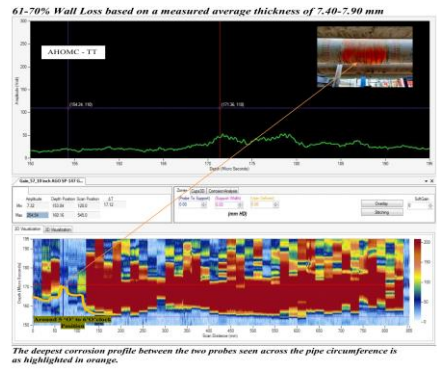
FOR CORROSION ASSESSMENT UNDER COMPOSITE SLEEVES

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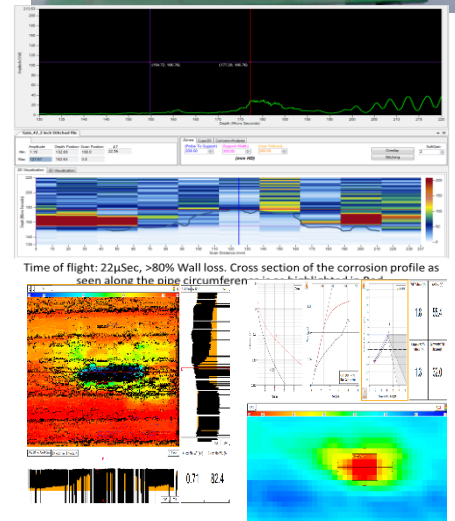
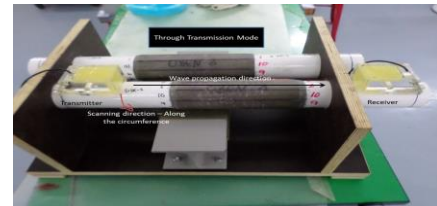
Corrosion Assessment Under Composite Sleeves



HOMC INSPECTION of 10 inch Hydrocarbon Line
 A 10inch hydrocarbon Line at a Terminal was repaired with a planned replacement of the repaired section scheduled over a specific window. There was an existing wall loss of around 60-65% of the nominal wall thickness seen earlier leading to the repair. When a delay to the replacement of the section happened, the integrity of the pipe under the repaired composite wrap section was to be done to allow for continued operation. The original measurements taken before repair was compared with HOMC estimates of the corrosion profile and wall loss determined and the inspection confirmed the exact location of the corrosion and also the depth of wall loss which was not found to be different then determined before the repair. to allow the client to make an estimate of existing condition of the pipe and thereby to allow for further continued service.



HOMC INSPECTION of 2 inch Wrapped Pipe
 A 2inch repaired composite wrapped sample was provided by a leading Petrochemical company with corrosion present under the wrap. The inspection was performed by Axial -TT HOMC and the results compared with Ultrasonic IRIS measurements and Pulsed Eddy Current. The defects were mapped very accurately by HOMC and sizing levels were extremely precise when compared with Ultrasonic IRIS measurement (>80% by HOMC and 82.4% by IRIS) .Pulsed Eddy Current based on inherent sizing ability was under sizing the defects by around 10%. The advantage of HOMC is that it not to be affected by the wrapping and through transmission technique deployed are amplitude independent to provide accurate defect profile and sizing.



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