TALCYON

APRIS

Case Study:
Petrochemical Plant (Italy)
Reboiler Tube Inspection

Overview

The efficiency of the distillation process in a petrochemical plant is mainly dependent on the condition of the Column Reboiler. Similarly, Depropanizer Reboiler and Stabiliser Reboiler are key equipment for gas processing plants.

The root cause of failure in such Reboiler Tubes are primarily due to corrosion on the interior side of the tubes. Oxygen concentration of the generated steam and concentrated steam are sources of pitting in Reboiler Tubes.

A petrochemical refinery in Italy discussed about their U-Type Reboiler issue with their in-house contractor who performs nondestructive testing services for the plant. Their expectation was to find the pitting on the tube interior side and acquire the precise location of the leaks.



The Technology

Detecting the Faults

Ø: 19.05mm **T:** 2.11mm **L:** 18.1m

The in-house contractor proposed inspection using APRIS.

APRIS uses a patented Acoustic Pulse Reflectometry technology that involves the propagation of sound wave through the tubes.

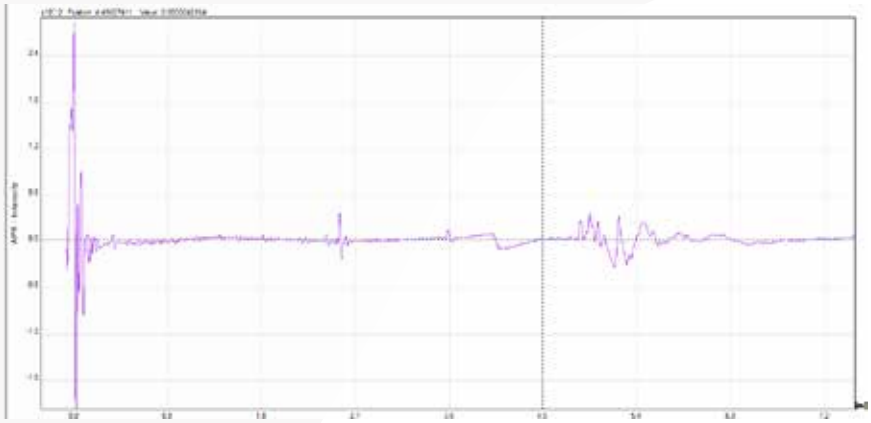
This was very suitable for the U-Type Reboiler as sound uses air as the medium. Hence the structure and material of the Reboiler would not affect APRIS' signal strength.

It was especially crucial to analyse the bends, as there was high suspicioun of corrosion, making APRIS even more suitable for this case.

Tubes that were reported with holes were first hydro tested to confirm the leak and later stripped for detailed examination.



Damaged Bend of U-Tube



Sample of Signals with Fault Signatures

Outcome Results

A total number of 356 U Tubes (712 holes) were inspected. It took only 1.5 hours to complete the inspection.

Initially they were thinking of plugging nearly 20% of tubes. After doing an inspection and with precise analysis, the plugging was almost 8% that resulted in higher efficiency due to corrective actions.

Using APRIS, it was possible to have 100% of the tubes inspected for a precise understanding of their inner diameter condition.

6% of tubes had wall loss between 41 - 60% which were plugged to avert any intermitten failures during operations. 9% of tubes had wall loss between 21 - 40% which were schedules for inspection every 2 years.

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