YANPET PRACTISE

ELIMINATE HIDDEN RISK OF CUI

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WHAT IS CORROSION UNDER INSULATION (CUI) ?

- CUI is an external corrosion that occurs under insulated carbon steel and SS equipment.

  - Carbon steel: \((-12^\circ \text{C})\) - \((175^\circ \text{C})\)
  - Stainless steel: \((60^\circ \text{C})\) - \((205^\circ \text{C})\)

CUI is promoted by:
- Water vapors condensation.
- Sweating service
- Temperature cycling.
- Poor condition of coating.
- Poor/broken insulation/cladding.
CUI GENERAL VIEW

BEFORE REMOVE INSULATION

AFTER REMOVE INSULATION
CUI GENERAL VIEW

BEFORE REMOVE INSULATION

AFTER REMOVE INSULATION
INSPECTION STRATEGY

• Inspection Strategy is RBI based approach

• Priority – 1: Sweating (continuous or cyclic) lines – require 100% insulation stripping and visual inspection and NDT.

• Priority – 2: Non sweating service Inspect as per API standard (suspected locations)
## CUI: PLANT CASES

### Line H-14015-3”-C322 Leaking Drain Valve & Corroded Pipe (Hydrogen)

<table>
<thead>
<tr>
<th>Line #</th>
<th>Line Associated Equipment</th>
<th>Damage</th>
<th>Original Thickness mm</th>
<th>Remaining Thickness mm</th>
<th>Risk Level</th>
<th>Risk status</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-14015-3”-C322</td>
<td>D-1451A</td>
<td>localized pitting</td>
<td>5.54</td>
<td>2.5</td>
<td>2</td>
<td>Mitigated Pipe replaced</td>
</tr>
</tbody>
</table>

Pipe replaced
# CUI: PLANT CASES

## P-13099A-14”-C322 Process (vapour)

<table>
<thead>
<tr>
<th>Line #</th>
<th>Line Associated Equipment</th>
<th>Damage</th>
<th>Original Thickness mm</th>
<th>Remaining Thickness mm</th>
<th>Risk Level</th>
<th>Risk status</th>
</tr>
</thead>
</table>
## CUI: PLANT CASES

### Line 2P-15166- C323

<table>
<thead>
<tr>
<th>Line #</th>
<th>Line Associated Equipment</th>
<th>Damage</th>
<th>Original Thickness mm</th>
<th>Remaining I Thickness mm</th>
<th>Risk Level</th>
<th>Risk status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2P-15166- C323</td>
<td>D-1451A</td>
<td>Minor wall lost &amp; bolts severely corroded</td>
<td>8.18</td>
<td>7.8</td>
<td>2</td>
<td>Mitigation is in progress</td>
</tr>
</tbody>
</table>
YANPET CUI MITIGATION STRATEGY

I. Inspect on time.

II. Watch insulation damage.

III. Restoration of CUI Coatings.

IV. Apply Thermal Spray Aluminum (TSA) on critical services.

V. Replace PP Insulation with grid metallic type.
YANPET PRACTICE WITH PP INSULATION

• Removed all PP insulation and replace it by metallic grid type.

• Personnel Protection (PP) insulation (Piping operating above 60 °C to 110 °C).

• Grid type eliminates the hidden Risk & Operator is still protected from hot surface.

• Grid type cost effective, easy to install, reuse and fast future inspection.
YANPET PRACTICE WITH PP INSULATION

Line covered with old PP insulation

Same line after removing the insulation.

The alternative idea after the installation.
PLEASE REMEMBER !!!

SAFETY FIRST

&

CORROSION UNDER INSULATION PROGRAM IS THE SAFE WAY.

➢ Always: AVOID DAMAGES TO THE INSULATION COVER
THANK YOU