

H2Obvious For CUI Mitigation

When Does CUI Occur?

CUI predominantly occurs on carbon steels and 300 series stainless steels. On carbon steels it manifests as generalised or localised wall loss. With the stainless pipes it is often pitting and corrosion induced stress corrosion cracking (SCC). Though failure can occur in a broad band of temperatures, corrosion becomes a significant concern in steel at temperatures between 0 and 149 °C (32 and 300 °F) and is most severe at about 93 °C (200 °F). Corrosion and corrosion induced stress corrosion cracking rarely occur when operating temperatures are constantly above 149 °C (300 °F). Corrosion under insulation is caused by the ingress of water into the insulation, which traps the water like a sponge in contact with the metal surface. The water can come from rain, leakage, deluge systems, wash water, or sweating from cycling temperatures or low temperature operation such as refrigeration units.

Systems Benefiting from H2Obvious for CUI Mitigation.

API 570 specifies the following areas as susceptible to corrosion under insulation: areas exposed to mist overspray from cooling water towers; areas exposed to steam vents; areas exposed to deluge systems; areas subject to process spills, ingress of moisture, or acid vapors; areas exposed to sea spray; carbon steel piping systems, including those insulated for personnel protection, operating between -4 and +120 °C (25 and 250 °F). Corrosion under insulation is particularly aggressive where operating temperatures cause frequent condensation and re-evaporation of atmospheric moisture.

Other susceptible areas include: carbon steel piping systems that normally operate in-service above 120 °C (250 °F) but are in intermittent service; austenitic stainless steel piping systems that operate between 60 and 204 °C (150 and 400 °F), as these systems are susceptible to chloride stress corrosion cracking; vibrating piping systems that have a tendency to inflict damage to insulation jacketing, providing an entry point and path for water ingress; steam traced piping systems that may experience tracing leaks, especially at the tubing fittings, insulation media joints beneath the insulation; piping systems with deteriorated coatings and/or wrappings; locations where insulation plugs have been removed to permit thickness measurements on insulated piping should receive particular attention.

All equipment will be shut down at some time or other. The length of time and frequency of down time spent at ambient temperature may well contribute to the amount of corrosion under insulation that occurs in the fabric. It would be an overwhelming task to muster the resources needed to tackle this extensive list of piping and vessels with traditional inspection methods. This is where H2Obvious offers a real advantage. Once installed, early detection and identification of exactly where water is entering the system gives a 'Heads-up' approach to where CUI susceptibility lies.

In all cases H2Obvious may be fitted either to piping or vessels that are scheduled for re-insulating or by retrospectively fitting the devices to in-service piping and vessels without the necessity of stripping down the equipment.