

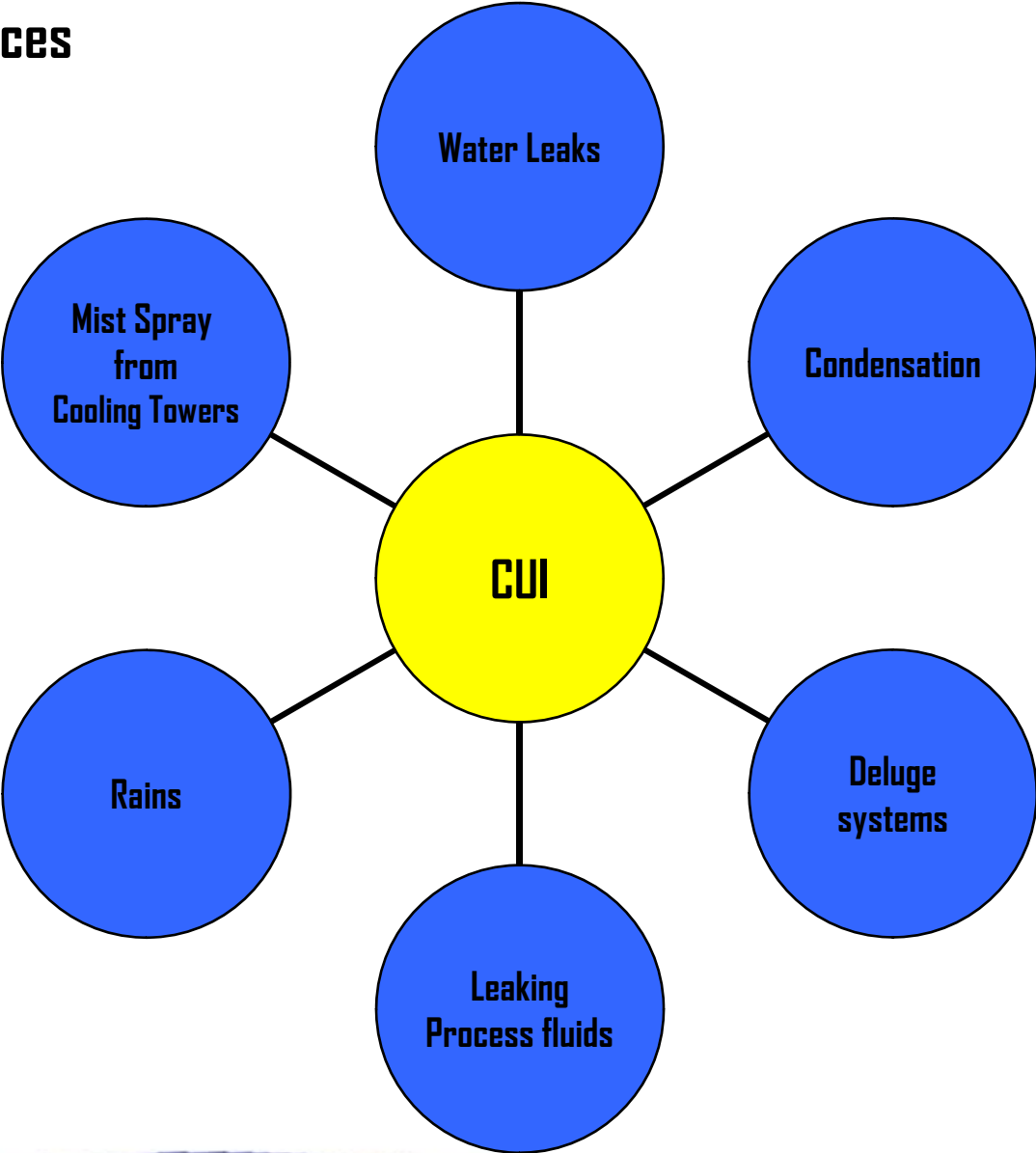
Corrosion Under Insulation

A practical prevention guide as per API 570

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Moisture Sources



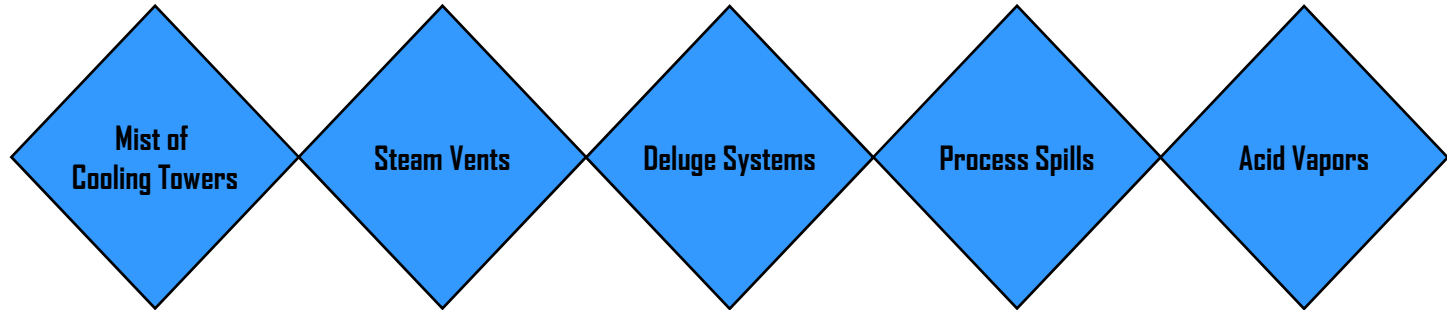
Common Forms

**Localized Corrosion of
Carbon Steel**

**Chloride Stress
Corrosion of Austenitic
Stainless Steels**

Susceptible Piping Systems

Areas exposed to



Carbon Steel Systems insulated for Human protection operating between -4 deg C - 120 deg C

Carbon Steel Systems operating above 240 deg C with intermittent service

Systems where operating temperatures cause frequent condensation and re-evaporation of atmospheric moisture

Austenitic SS systems with operating Temperature between 65 deg C to 204 deg C (Chloride Stress Corrosion)

Susceptible Piping Systems

Deadlegs and attachments protruding from insulation

Vibration systems with damaged insulation and jacketing

Steam tracing systems with tracing leaks

Systems with deteriorated coating and wrapping

Susceptible Common Locations

Penetrations/breaches in jacket

Damaged/missing jacketing

Hardened, separated, or missing caulking

Piping low points in systems that have insulation breach

Jacket seams on top of horizontal piping or improperly lapped/sealed jacket

Carbon or low-alloy steel components in high-alloy systems

Susceptible Common Locations

Termination in insulation at flanges and other piping components

Termination of insulation in a vertical pipe

Bulges or staining of insulation or jacketing system (bulges may indicate corrosion products)

Special Considerations

**Insulation damage at higher elevations
May cause CUI at lower elevations**

Insulation removal, RT may be required

Expand inspection as necessary

Systems may be excluded:

- 1. Remaining life > 10 years**
- 2. Adequately protected externally**

Piping Service Classes

Class	Description
1	<ul style="list-style-type: none">• Highest potential of immediate emergency if leak• Examples:<ul style="list-style-type: none">– Flammable service that may auto-refrigerate– Pressurized services that may rapidly vaporize and form explosive mixture– H₂S in gas stream (> 3 wt. %)– Anhydrous hydrogen chloride; HF– Pipe over or adjacent to water; over public thoroughways
2	<ul style="list-style-type: none">• Services not in other classes• Includes most process unit piping and selected off-site piping
3	<ul style="list-style-type: none">• Flammable services that do not significantly vaporize when leak• Services harmful to human tissue but located in remote areas

Recommended Inspection Interval

Circuit Type	Thickness Measurements, years	Visual External, years
Class 1	5	5
Class 2	10	5
Class 3	10	10
Injection points	3	By Class
Soil-to-air interfaces	-	By Class

CUI Inspection Targets

Pipe Class	Amount of Follow-up NDE or Insulation Removal Where Insulation Damaged	Amount of NDE at Suspect Areas on Piping Within Susceptible Temperature Ranges
1	75%	50%
2	50%	33%
3	25%	10%

THANKS

- thePetroStreet team

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