

## Incident Summary #II-1039707-2020 (#18815) (FINAL)

SUPPORTING INFORMATION	Incident Date	July 15, 2020	
	Location	Lower Mainland	
	Regulated industry sector	Boilers, PV & refrigeration - Boiler and pressure vessel system	
	Impact	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Damage	Damage description	Light hydrocarbon was released through a pinhole breach of an insulated process pipe.
		Damage rating	Minor
Incident rating	Minor		
Incident overview	A plant operator detected an abnormal hydrocarbon odor and immediately responded as per site emergency protocol. A localized possible breach was identified, and the process unit was safely shut down for further investigation.		
INVESTIGATION CONCLUSIONS	Site, system and components	A 3-inch insulated pipe connecting process piping to a pressure safety relief valve. The pressure relief valve is designed to open to relieve excess pressure into a Flare system in the event an emergency over pressure occurs.	
	Failure scenario(s)	Corrosion under insulation (CUI) on carbon steel piping resulted in a leak of light hydrocarbon. The process pipe operated within the CUI temperature range (Approximately 115°C) and in a marine environment.	
	Facts and evidence	<p>Upon the removal of the insulation, inspection of the pipe wall verified external thinning of the metal had occurred at the sweep of the elbow, resulting in a pinhole breach.</p> <p>The damage was consistent with corrosion under insulation (CUI) which is an external damage of metallic components and equipment that are insulated. Damage is caused by moisture ingress through the insulation material. Carbon steel and low-alloy steels corrode in the temperature range between -5°C and 175°C (25°F and 350°F).</p> <p>The facility operates in a marine environment which increases susceptibility to CUI damage, the location of external damage was aligned with a low point where moisture would collect if the insulation were damaged, and insulation damage was identified on the piping above the leak location.</p> <p>It was confirmed that the safety relief valve did not lift and operated as designed.</p> <p>It was confirmed that the facility's inspection strategy meets or exceeds industry standards, and that a dedicated maintenance team was in place for repairs.</p>	
	Causes and contributing factors	<p>Cause: There was an insulation breach creating a location of susceptibility to CUI on process piping.</p> <p>Contributing Factors: It was identified that a more robust prioritization methodology for insulation repairs may have reduced the likelihood of the piping breach.</p>	



Image 1 - Pinhole found on the elbow after removing the insulation.

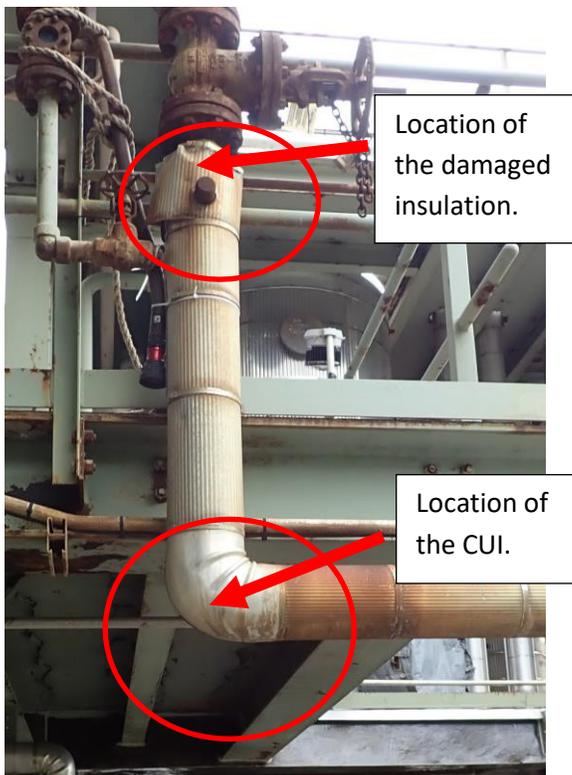


Image 2 - Location of the CUI before removing the insulation.