

Incident Summary #II-1147558-2021 (#20825) (FINAL)

SUPPORTING INFORMATION	Incident Date	February 9, 2021	
	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	Sour water was released through a pinhole breach of an insulated process pipe.
		Damage rating	Minor
Incident rating	Minor		
Incident overview	Operations detected a leak on an insulated carbon steel horizontal 2" discharge pipe from a pump 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. The area was taped off and there were no reported injuries.		
INVESTIGATION CONCLUSIONS	Site, system and components	A 2-inch horizontal section of insulated process piping approximately 3 feet in length. The pipe service was sour water, which is classified as API Class 2 Service.	
	Failure scenario(s)	Corrosion under insulation (CUI) on carbon steel piping resulted in a leak of sour water. The process pipe operated within the CUI temperature range (approximately 100°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 on the horizontal section, resulting in a pinhole breach.</p> <p>The line remained isolated until it was replaced in kind.</p> <p>This piping is inspected with radiography as part of the site Compliance Program. All CMLs were compliant in their inspection frequency and did not detect CUI as a damage mechanism. The damage occurred on the section of pipe directly between assigned CML points.</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 horizontal broken seal to the insulation jacketing identified in a previous report where moisture would collect.</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	Cause: There was an insulation breach creating a location of susceptibility to CUI on process piping.	

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Contributing Factors: Although a minor deficiency was noted on the last inspection report, there was no evidence whether the deficiency had been evaluated at that time or that a work order had been created to address it. In the 5 years since the inspection date, significant improvements to the API 570 reporting process have been implemented including a more robust prioritization methodology for insulation identification.

Photos or diagrams

