

Incident Summary (Reference # II-694077-2018)

SUPPORTING INFORMATION	Incident Date	May 26 2018	
	Location	Langley	
	Regulated industry sector	Natural gas system	
	Injury	Qty injuries	0
		Injury description	N/A
		Injury rating	N/A
	Impact Damage	Damage description	A natural gas explosion occurred at a residence inside a direct vented gas fireplace combustion chamber and venting system. The natural gas explosion damaged the venting beyond repair and scattered metal debris onto two sides of the residence outdoors
		Damage rating	Moderate
		Incident rating	Moderate
	Incident overview	<p>A natural gas explosion occurred at a residence inside a direct vented gas fireplace combustion chamber and venting system. This explosion was contained to the gas fireplace combustion chamber and venting system. The gas explosion destroyed the venting and compromised the gas fireplace, the gas fireplace and venting must be replaced.</p>	
INVESTIGATION CONCLUSIONS	Site, system and components	<p>During normal operation of this gas fireplace the thermostat is set to automatically cycle the gas fireplace on and off to maintain the residence at the set room temperature. When the thermostat falls below the set temperature and calls for heat the gas fireplace control board initiates the burner to ignite by first lighting the ignition pilot and then the burner. When the thermostat is satisfied that the room temperature has risen to the desired temperature it turns off the gas fireplace. The gas safety valve opens when there is a call for heat and closes when the thermostat is satisfied and when the gas safety valve was too close it stuck open allowing natural gas to accumulate in the fireplace combustion chamber and venting system</p>	
	Failure scenario(s)	<p>During normal operation of this gas fireplace the thermostat was set to automatically cycle the gas fireplace on and off to maintain the residence at the set room temperature. After being turned on in the morning and heating up the residence the gas fireplace cycle off and on again at approximately 1:00pm and an explosion occurred caused by a buildup off natural gas in the gas fireplaces combustion chamber and venting. This was caused because the gas safety valve failed to close completely allowing natural gas to pass through the safety valve into the fireplace combustion chamber and be ignited when the thermostat called for heat.</p>	

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Facts and evidence	<ul style="list-style-type: none">- Gas fireplace explosion, May 26-2018 – 1pm- I met with homeowner and he confirmed that they were using the fireplace to heat the home- After being turned on in the morning and heating up the residence the gas fireplace cycle off and on again at approximately 1:00pm and an explosion occurred- I talked to homeowner's fire investigator and he confirmed that the fireplace was secured by him- It was determined by an onsite pressure test by gas contactor's gas fitter supplied by the homeowners insurance company that the gas safety valve was stuck partially open and this caused the buildup of natural gas that exploded in the gas fireplace and venting
Causes and contributing factors	<p>The gas safety valve failed to operate correctly(did not close completely) and was most likely the cause of this explosion</p>



Figure 1 - Front view of fireplace with drywall removed



Figure 2 - View of gas fireplace venting above fireplace 10-15' away



Figure 3 View of fireplace venting above fireplace extending through 2nd floor to roof termination



This is a picture of the gas safety valve that failed