

Incident Summary #II-1147517-2021 (#20823) (FINAL)

SUPPORTING INFORMATION	Incident Date	February 13, 2021	
	Location	Castlegar, BC	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	None
		Injury rating	None
	Damage	Damage description	Main distribution panel board and associated branch wiring dwelling sustained fire and heat damages.
		Damage rating	Moderate
	Incident rating	Moderate	
Incident overview	Main distribution 100-amp 120/240-volt panel board and associated branch wiring in a single family dwelling sustained fire and heat damages when a surge suppressor installed in the main distribution panel board ignited.		
INVESTIGATION CONCLUSIONS	Site, system and components	A 120/240-volt surge suppressor was installed in a branch circuit position in a 100-amp 120/240-volt single phase panel board. The panel board was installed in a basement area of a single-family dwelling. The surge suppressor is fitted with components that are intended to suppress momentary over-voltage conditions, or voltage surges thereby protecting those components installed on the load side, or downstream, of the surge suppressor from potential damage during a momentary over-voltage event.	
	Failure scenario(s)	<p>On the evening of the incident the local area electric supply authority was informed that other dwellings in the general area reported flickering lighting and appliance failures. The supply authority responded to the reports and discovered that a faulty pole mounted transformer was delivering erratic, random high and low voltages to structures supplied from the transformer.</p> <p>The property owner of the dwelling involved in the incident noted interior lighting was flickering and appliances were creating popping and crackling noises prior to the incident. He then heard a loud 'bang' in the basement. The property owner descended into the basement to investigate the noise and noted smoke and flames in and around the area of the main distribution panel board installed on basement exterior wall.</p> <p>The property owner called 911, manually opened the main breaker and evacuated the dwelling.</p>	
	Facts and evidence	Information obtained in a statement from the property owner indicated the owner heard a loud 'bang' in the basement prior to noting smoke and flame in and around the area of the panel board. Information obtained from the area electric supply authority indicated that powerline technicians discovered erratic voltages were being delivered to customer service equipment from a pole mounted transformer. The powerline technicians were responding to customer reports of flickering lights and appliance failures at adjacent properties to the incident site.	

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	<p>Examination of the surge suppressor and panel board revealed that the surge suppressor ignited during momentary over-voltage conditions. The over-voltage values impressed on the service equipment and surge suppressor were very likely a result of a faulty, failing electric supply authority pole mounted transformer. The surge suppressor enclosure is constructed of polymer, plastic material. The burning surge suppressor enclosure ignited adjacent polymer, plastic panel board components, adjacent branch wiring conductor insulation, and adjacent branch wiring cable insulation.</p>
Causes and contributing factors	<p>All evidence indicates that the electric service equipment was impressed with voltage values that exceeded the service equipment electric ratings and the surge suppressor protection capability. The loud 'bang' noticed by the dwelling owner was likely the surge suppressor internal components rupturing on an over-voltage, electric arcing event. The electric arcing ignited the combustible surge suppressor components and enclosure and created a fire incident inside the panel board.</p>



Main dwelling panel board, installed on basement level



Burnt branch wiring conductor insulation



Burnt branch wiring cable insulation above panel board



Square D Surgebreaker Suppressor QO2175SB 120/240v 5ka – top view



Square D Surgebreaker Suppressor QO2175SB 120/240v 5ka – side view



Square D Surgebreaker Suppressor QO2175SB 120/240v 5ka – other side view



Square D Surgebreaker Suppressor QO2175SB 120/240v 5ka – back view