

## Incident Summary #II-2195416-2021 (#20823) (FINAL)

	Incident Date	February 13, 2021
	Location	Castlegar, BC
_	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)
TION	Qty injuries	0
)RMA	্র Injury description	None
INFO	Injury rating	None
SUPPORTING INFORMATION	Damage  description  Damage rating	Main distribution panelboard and associated branch wiring dwelling sustained fire and heat damages.
POR	Damage rating	Moderate
SUF	Incident rating	Moderate
	Incident overview	Main distribution 100 amp 120/240 volt panelboard and associated branch wiring in a single family dwelling sustained fire and heat damages when a surge suppressor failed and ignited while providing over-voltage protection.
	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 panelboard installed in a basement area of a single family dwelling. The surge suppressor is fitted with components that rupture and create a short-circuit when a voltage value higher than the rated voltage limit is impressed on the equipment it is protecting. The short-circuit trips open an upstream main breaker or fuse thus de-energizing the branch wiring and providing protection from any subsequent over-voltage condition and potential damage.
INVESTIGATION CONCLUSIONS	Failure scenario(s)	The local area electric supply authority was informed that multiple dwellings in the incident 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.  The property owner noted dwelling interior lighting was flickering and appliances were creating popping and crackling noises and 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 panelboard installed on basement exterior wall.  The property owner called 911, manually opened the main breaker and evacuated the dwelling.
	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 the area of the panelboard.  When a surge suppressor operates on an over-voltage condition it creates a loud noise when the protection devices rupture to create the intentional short circuit on the system to actuate operation of upstream overcurrent protection.



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Examination of the surge suppressor and panelboard revealed that the surge
suppressor involved in the incident did not create the intended short circuit when the
protection devices ruptured on the over-voltage condition. Instead, the plastic
enclosure of the surge suppressor ignited when the protection components ruptured.
The burning surge suppressor enclosure ignited adjacent plastic panelboard
components, adjacent branch wiring conductor insulation, and adjacent branch wiring
cable insulation.

Causes and contributing factors

All evidence indicates that the surge suppressor protection did not operate as designed.



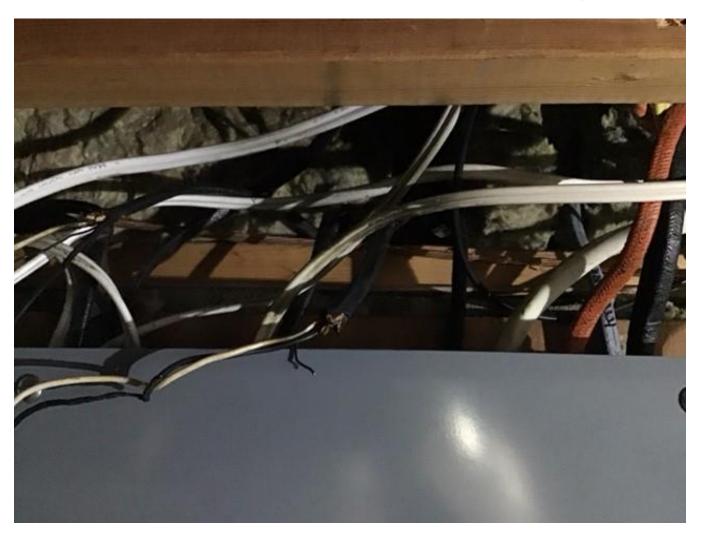
Main dwelling panelboard, installed on basement level





Burnt branch wiring conductor insulation





Burnt branch wiring cable insulation above panelboard





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