

## Incident Summary #II-1420734-2022 (#29331) (FINAL)

SUPPORTING INFORMATION	Incident Date	August 13, 2022	
	Location	Chilliwack	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Damage	Damage description	A 600-amp main service switch suffered internal fire damage. The underground service conductors that enter the bottom of the 600-amp switch were damaged. All the fire damage was contained inside the 600-amp service switch.
		Damage rating	Moderate
Incident rating	Moderate		
Incident overview	Small fire in a 600-amp, 240-volt main service switch at a mobile home park resulting in damage to electrical service equipment that left 48 mobile homes without power.		
INVESTIGATION CONCLUSIONS	Site, system and components	<p>The incident occurred at a mobile home park that consists of 99 mobile homes. One of the electrical services to this park is a 600-amp, 240-volt single phase service fed from a utility pole mount transformer, underground to a small storage building. The 600-amp service consists of a bottom fed 600-amp 240-volt rated fused switch that feeds a 600-amp rated splitter, and other sub distribution equipment that is mounted adjacent to the 600-amp switch (See <a href="#">Figure 1</a>). This service provides power to 48 mobile homes, as well as a small electrical load of power and lighting inside the storage building.</p> <p>The 600-amp, 240-volt fused switch is the first point where the utility service conductors terminate inside the building. The utility service conductors terminate on the line side lugs at the top of the switch, and the load side conductors terminate on the lugs at the bottom of the switch. In between the line and load sides of the switch there are fuses installed to provide protection in case of an electrical fault or overload situation that may result in damage to electrical equipment, or a fire.</p>	
	Failure scenario(s)	<p>On the line side of the 600-amp main switch there was a poor connection on one of the service conductors. This led to a build up of heat at the conductor termination point. The heat was caused by electrical current trying to flow through the high resistance at the poor connection point. The heat at the connection point eventually resulted in a small fire inside the switch. The fire melted the insulation on the service conductors, causing the conductors to short out on the metallic enclosure of the switch. When the conductors shorted out, the primary fuse blew at the utility transformer on the pole, and completely disconnected power to the building. When power was cut off to the building, current stopped flowing through the conductors and the fire was put out.</p>	

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<p>Facts and evidence</p>	<p>Examination of the damaged fused switch showed:</p> <ul style="list-style-type: none"><li>• A lug nut on the Line 1 conductor termination point that was not threaded in as far as the lug nut beside it meaning one of the terminations was not as tight (see <a href="#">Figure 2</a>).</li><li>• Melted insulation on the service conductors above the Line 1 termination point suggesting the high heat location.</li><li>• The Line 2 service conductor insulation was not as damaged as Line 1 above the termination point, suggesting this location was not as hot (see <a href="#">Figure 2</a>).</li><li>• There was more soot present on the Line 2 conductors and termination lugs, suggesting this location was not as hot as the Line 1 side.</li><li>• Service conductors pressing up tight against the top of the metallic enclosure of the switch.</li><li>• Burn marks and high heat markings on top of the inside of the metallic switch enclosure, suggesting conductor short circuit location.</li></ul> <p>Other evidence:</p> <ul style="list-style-type: none"><li>• The primary fuse was hanging down at the pole mount transformer meaning there was a short circuit between the Line side of the 600-amp main switch and the transformer.</li><li>• A power analyzing meter was installed on the service conductors after the fire and showed that the 600-amp service is near capacity. This would suggest a large amount of current flowing through the poor connection point which would cause excessive heat.</li></ul>
<p>Causes and contributing factors</p>	<p>It is very likely that this fire occurred due to a poor connection of a line side conductor termination inside the 600-amp fused switch. Contributing factors are the heavily loaded service cables that created high heat at the loose connection point, that could eventually start a fire.</p>

Figure 1



Figure 2

