

Incident Summary #II-1144715-2021 (#20737) (FINAL)

SUPPORTING INFORMATION	Incident Date	February 9, 2021	
	Location	Abbotsford, British Columbia	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	NA
		Injury rating	None
	Damage	Damage description	A wall mount 4' fluorescent light fixture sustained fire damage to the internal wiring and the acrylic lens. Minor smoke and water damage to the classroom walls, ceiling tiles and counter top.
		Damage rating	Minor
Incident rating	Minor		
Incident overview	A fire in a classroom at a middle school occurred when a 4' wall mounted fluorescent light fixture reached a high enough temperature to ignite the acrylic cover over the lamps. Once the cover started to melt, burning pieces of acrylic dropped on the counter below the light and spread the fire. The teacher in the classroom activated the fire alarm pull station and evacuated the classroom, shortly followed by the sprinkler system activating to extinguish the fire.		
INVESTIGATION CONCLUSIONS	Site, system and components	<p>The fluorescent light mounted above the counter where the classroom sink is located should have solid connections to the wiring, and provide light reliably without any significant heat build-up. Any malfunctions of the wiring or connections such as arcing should be contained within either a junction box in the wall of the building or the wiring space of the fixture until the problem is rectified or a protective device stops the supply of current to the fixture.</p> <p>The light fixture has an OSRAM instant start electronic ballast that draws 0.53 amps at 120V on a 15A circuit.</p> <p>The electrical supply to the light fixture is protected by a circuit breaker at the electrical panel, which is designed to trip and shut off the electrical supply if the current draw is too high for a prolonged period of time or if there is a short circuit path for the electrical current.</p>	
	Failure scenario(s)	<p>A wall mounted 4' fluorescent cube light had a loose connection where the identified conductor from the building wiring connected to the ballast wiring inside the wiring compartment of the fixture. This loose connection caused higher resistance to current flow and thus abnormal heating at the connection point. Over time, this heating resulted in melting of the twist-on wire connector and the insulation on both sides of the connection to burn off. The heat generated from this situation eventually melted twist-on wire connectors and insulation on other portions of the ballast wiring in close proximity within the fixture. It is possible that the overcurrent device did not operate because there was no overload condition and even with the melted insulation, the wires never made contact required to create a short circuit.</p> <p>It appears that the melting of the other ballast connections resulted in poor current flow throughout the system, and caused arcing at one of the pins of the outer fluorescent lamp, which resulted in further overheating and burning at the lamp holder on the end of the fixture where the fire originated.</p>	

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	<p>Once the acrylic lens was ignited from the heat from the wiring compartment or from the lamp holder, the lens began to melt and the fire was spread to the wall and counter below the light fixture.</p>
<p>Facts and evidence</p>	<ul style="list-style-type: none"> -Witness statement from the teacher assigned to the classroom indicates that an odour similar to the one present when the fixture was on fire was also present in the weeks prior to the incident. This would indicate the connections had been slowly melting as the condition worsened. -Statement from the teacher indicated that shortly after turning on the lights on the morning on February 9, a more intense odour was present. Suspicious of a problem, the teacher unplugged the coffee maker on the counter below the light. -Statement from the teacher that he witnessed the acrylic cover for the fixture on fire, and molten pieces of the cover spreading the fire by dropping onto the counter below. -Statement from school district representative and picture confirm that fixture was tested after fire to rule out a defective ballast as the cause of the fire. SEE PHOTO #2. -Statement from school district representative that identified conductor connection was extremely loose when fixture was removed from the classroom. -Comparison of the damaged fixture and another identical fixture from another classroom show that no modifications were made to the fixture. SEE PHOTO #6. -Examination of the burned fixture shows that the insulation on the identified conductor is burned several inches back from the connection point, and that other connections in the immediate area are burned. SEE PHOTOS #3 & 4. -While there is evidence of overheating at the lamp pin to tombstone connection for one of the lamps, the burning at this point does not spread to where the worst of the fire occurred. This would indicate that it was not a direct cause of the fire. SEE PHOTO #5. -Images provided from site show the remains of the melted acrylic cover on the counter below the fixture. SEE PHOTO #1. -Physical examination of the burned fixture shows signs of burning within the wiring compartment, and heat transfer through to the lamps and acrylic cover.
<p>Causes and contributing factors</p>	<p>The cause of the fire was likely a poor connection of the identified conductor between the building wiring and ballast wiring. Higher than normal resistance and arcing at this poor connection likely generated excessive heat, which lead to melting of the non-metallic components of the fixture and ultimately a fire.</p>



Photo #1 – Overall Incident Scene



Photo #2 – Light operating after fire once heat dissipated.



Photo #3 – Identified conductor showing burned insulation.



Photo #4 – Other connections melted due to heat.



Photo #5 – Outer tombstone burning separate from fire.



Photo #6 – Example fixture wiring matches damaged fixture wiring.