Incident Summary #II-966933-2020 (#16355) (FINAL)

SUPPORTING INFORMATION	Incident Date		January 14, 2020
	Location		Nelson, BC
	Regulated industry sector		Electrical - Low voltage electrical system (30V to 750V)
	Impact – Injury	Qty injuries	0
		Injury description	None
		Injury rating	Minor
	Impact – Damage	Damage description	Internal components and terminated conductors of a 100A 240V 1PH fused disconnect switch were damaged. Damage resulted from the electrical fire were contained by and isolated to the disconnect enclosure.
		Damage rating	Minor
	Incident rating		Minor
	Incident overview		A high impedance arcing condition was created by a loose conductor termination. Over time, the arcing condition resulted in an elevated temperature at the termination point. The elevated temperature exceeded the temperature rating of the conductor insulation and component temperature termination ratings resulting in an electric fire incident.
INVESTIGATION CONCLUSIONS	Site, system and components		The multi dwelling structure is serviced with a 400amp, 240volt electric supply to an array of service equipment installed in an attached electrical room. A 400amp, 240volt single phase main fused service disconnect controls and supplies energy to six suites and a panelboard for structure 'house loads'. Three suites are supplied and controlled by 60amp 240v sub-distribution, 3 suites are supplied and controlled by 100amp 240v sub-distribution, house loads are supplied from a 100amp 240volt combination style panelboard. Each suite has a respective subpanel, typical dwelling branch wiring to standard dwelling appliances, devices, electric baseboard heating.
	Failure scenario(s)		Evidence gathered from the site revealed that the 'line' conductor termination of one pole of the 100amp 240volt fused disconnect supplying energy to unit 2 was not tight. Over time, the loose termination resulted in a high impedance arcing condition. The high impedance arcing condition created a high temperature condition at the termination. The high temperatures reached a level that exceeded the conductor and component temperature ratings The high temperatures reached a critical level resulting in a breakdown, meltdown, fire and failure of the conductor insulation and termination components.
	Facts and evidence		Evidence was obtained by the field safety representative (FSR) of a local licensed electrical contractor and reviewed by the local safety officer. The FSR opened the damaged fused disconnect, obtained photographs, dis-assembled the internal components and discovered the loose conductor termination that resulted in the electric fire incident.
	Causes and contributing factors		The occupant of unit #2 noted poor electric power quality for approximately six weeks prior to the incident. Poor power quality issues in the form of flickering lights,

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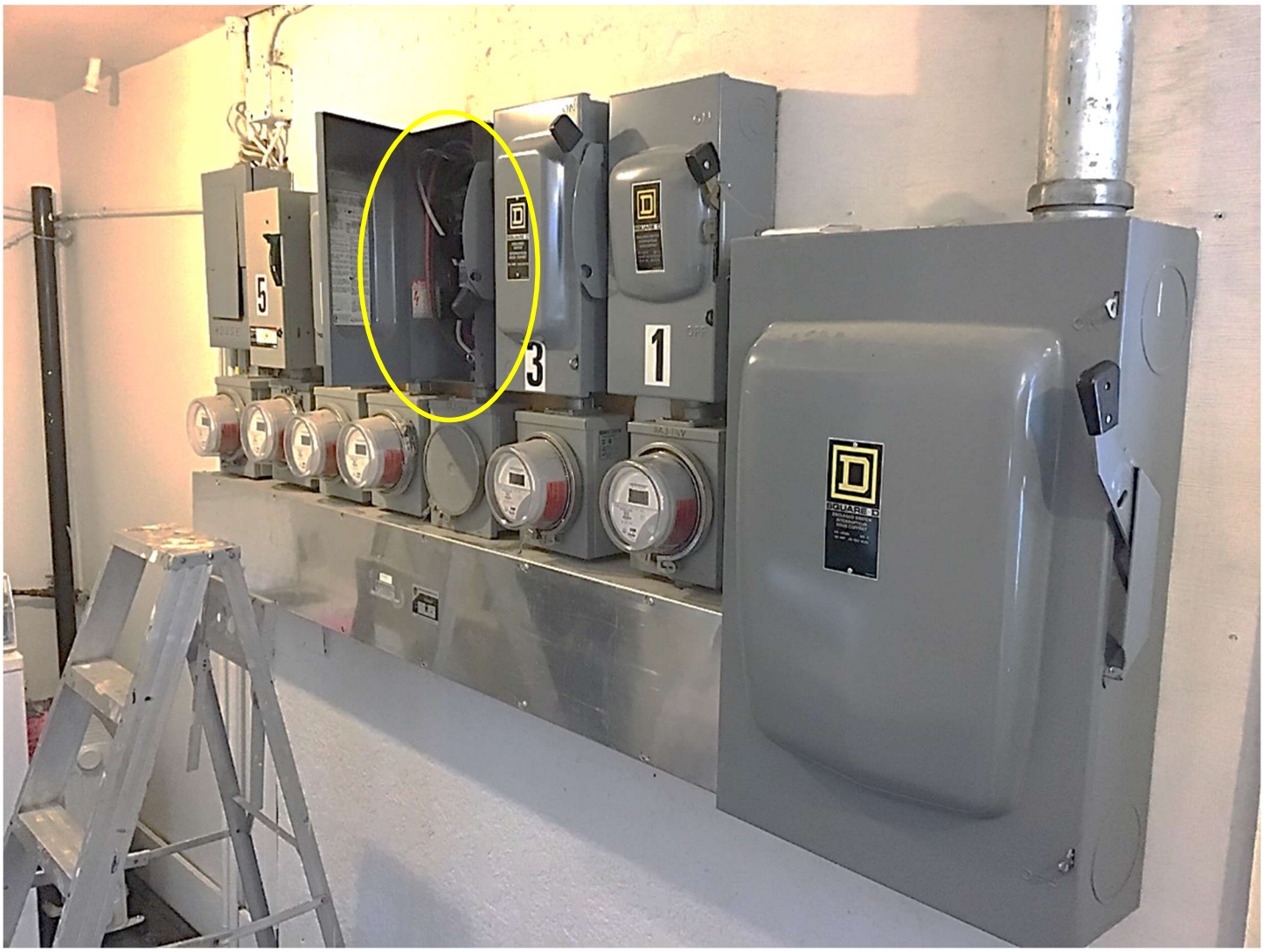
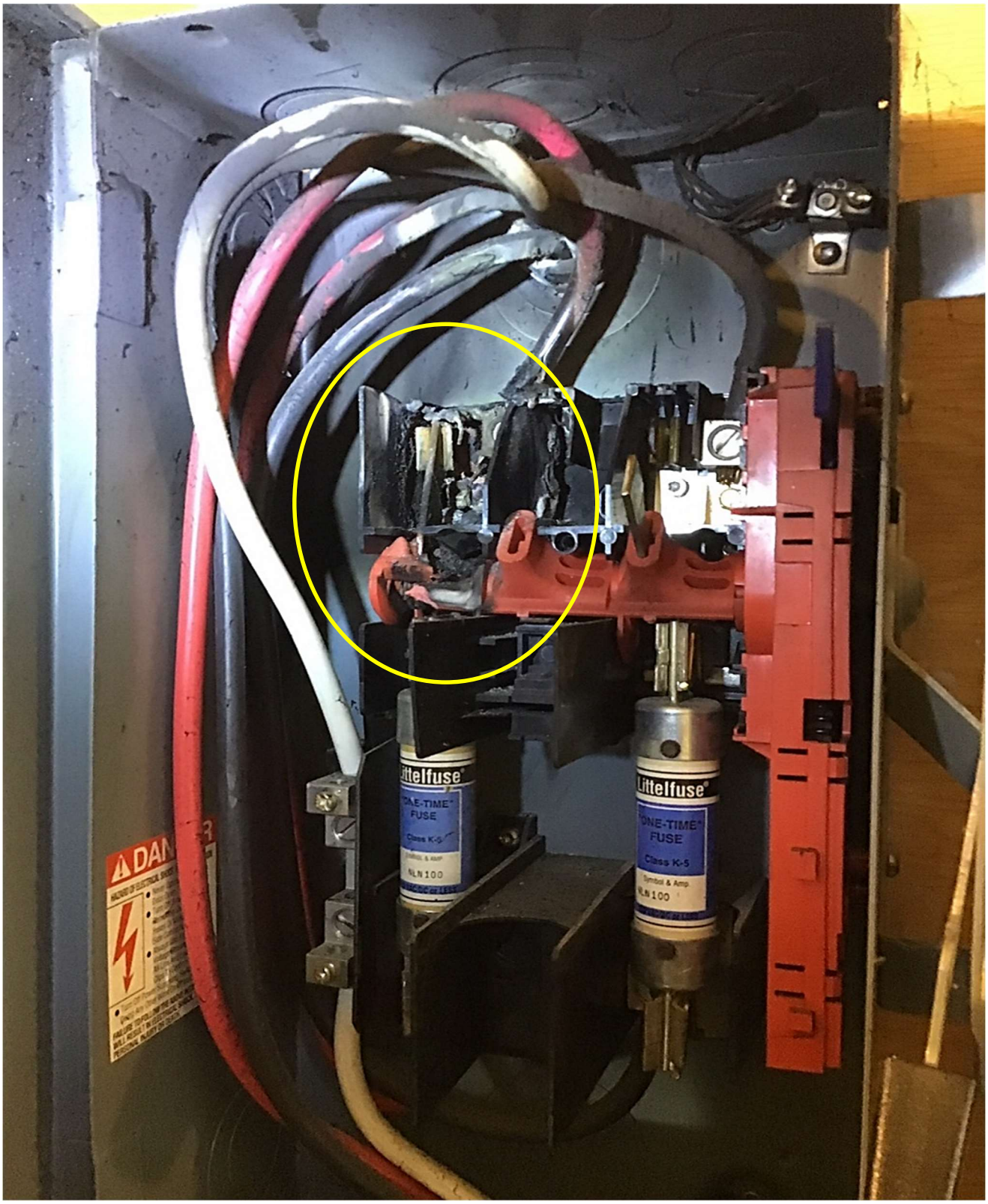
intermittent receptacle operation, intermittent appliance operation increased in frequency over time and the days prior to the incident. The power quality issues are classic symptoms of poor or loose conductor terminations creating high termination impedance, high electric currents, high temperature conditions, potential incidents.

Photos or diagrams (if necessary)



Main fused disconnect, far right, sub-distribution to the left – circled area is the damaged fused disconnect supplying unit #2

100A 240V fused disconnect supplying unit #2



Internal components and damage of fused disconnect, unit #2 – circled area: loose conductor termination, failure and damage – note that the articulating blade is melted into the jaw at the failed termination, it will not move to open the contact; the other blade is moving effectively.

Photo of building