Incident Summary #II-1382708-2022 (#28074) (FINAL)

SUPPORTING INFORMATION	Incident Date		May 26, 2022
	Location		Kamloops, BC
	Regulated industry sector		Electrical - High voltage electrical system (greater than 750V)
	Impact – Injury	Qty injuries	1
		Injury description	A worker sustained 1st/2nd degree burns to their hand, arm, and hip.
		Injury rating	Moderate
	Impact – Damage	Damage description	N/A
		Damage rating	None
	Incident rating		Moderate
	Incident overview		Electricians were performing routine, annual maintenance on a High Voltage transformer. Upon completion of transformer maintenance and prior to closing all the equipment and re-energizing the system, the crew foreman (worker) wanted evidence of good operating condition of the load break switch knives. The top section of the live end of the load break switch was removed and the worker reached into the equipment with a camera. While reaching in, the live system arced over to the worker and entered the workers left hand.
INVESTIGATION CONCLUSIONS	Site, system and components		Electrical room housing the Electrical Vault unit found within the building parkade - (Photo 1). Electrical Vault unit - (Photo 2) - 12.5Kv Load break switch. - 1000Kva Dry type Transformer. - 600Volt Main Distribution center. 12.5Kv Load break switch - (Photo 3). The switch has 2 sections (Photo 3). The lower section is the switch service compartment. The upper section is the “live” supply where the knives of switch reside when main switch is in the opened position. The utility supplies 12,500volts (12.5kv) underground from the utility supply distribution system. This enters the vault (Photo 2) from the underground rear side of the enclosure and terminates to the supply side of the load break switch (Photo 3) at the top. The electricity flows from the switch to the 1000kva transformer where the power transforms from 12.5kv down to 600volts for distribution to dedicated consumer retail units.

Incident Summary #II-1382708-2022 (#28074) (FINAL)

	This 600volt main distribution center is also viewed in (Photo 2).
Failure scenario(s)	Three on-site electricians set up for a night shift power shut down and servicing / cleaning protocol. (1x Foreman = Worker 1 and 2x electricians = Workers 2,3). The crew was set up and equipped with all required PPE and safe-work procedures in place. Once the scope of work was completed, (removal of the temporary grounding from the transformer, bolting the transformer back together and then removing of the kirk key and returning the key to its load break switch location). Worker 1 removed their PPE. Worker 1 then decided to view the knives on the load break switch where they noticed discoloration in the energized portion of the switch and decided to open the cabinet door to investigate. Worker 1 stated confidence (very comfortable in the surroundings) and was aware that the switch section was in the de- energized position. Worker 1 then proceeded to reach in front of the knives on the load break switch with a smart phone in hand to take photos of the decolorization that was present on the knives. The worker's left hand came in proximity to the exposed and energized buss bar, where the system then arced over to their left hand, travelled up their forearm then down the left side to their hip. Due to the left hip resting on the grounded door through the worker's left hip acted more as a flash over then electrocution. This resulted in 1st and 2nd degree burns.
Facts and evidence	Following an Interview with the owner of the electrical contracting firm and the firm's health & safety manager and the worker, it was confirmed that all installation practices, including following standard operating procedures and the donning of approved personal protective equipment was followed until the re-energization phase. Worker 1 confirmed the sequence of events as well as confidence that the load break switch section was de-energized.
Causes and contributing factors	It is highly probable that the night shift work and having the electrical room vault all to the electrical service crew's privacy (no one at the mall with all systems shut down and no time pressure) led to service work over-confidence.

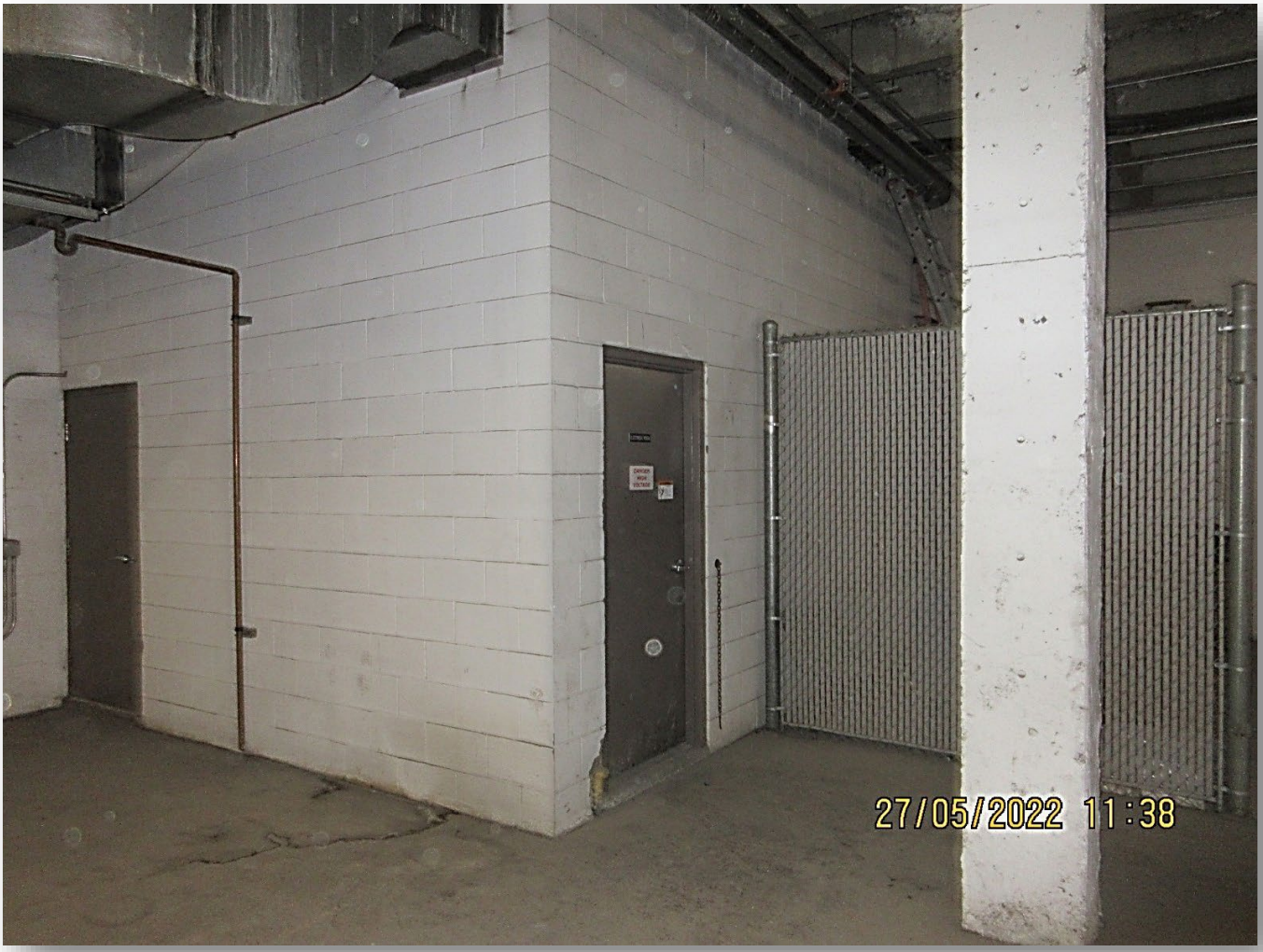

Photo 1 – Electrical room as seen from the parkade area.

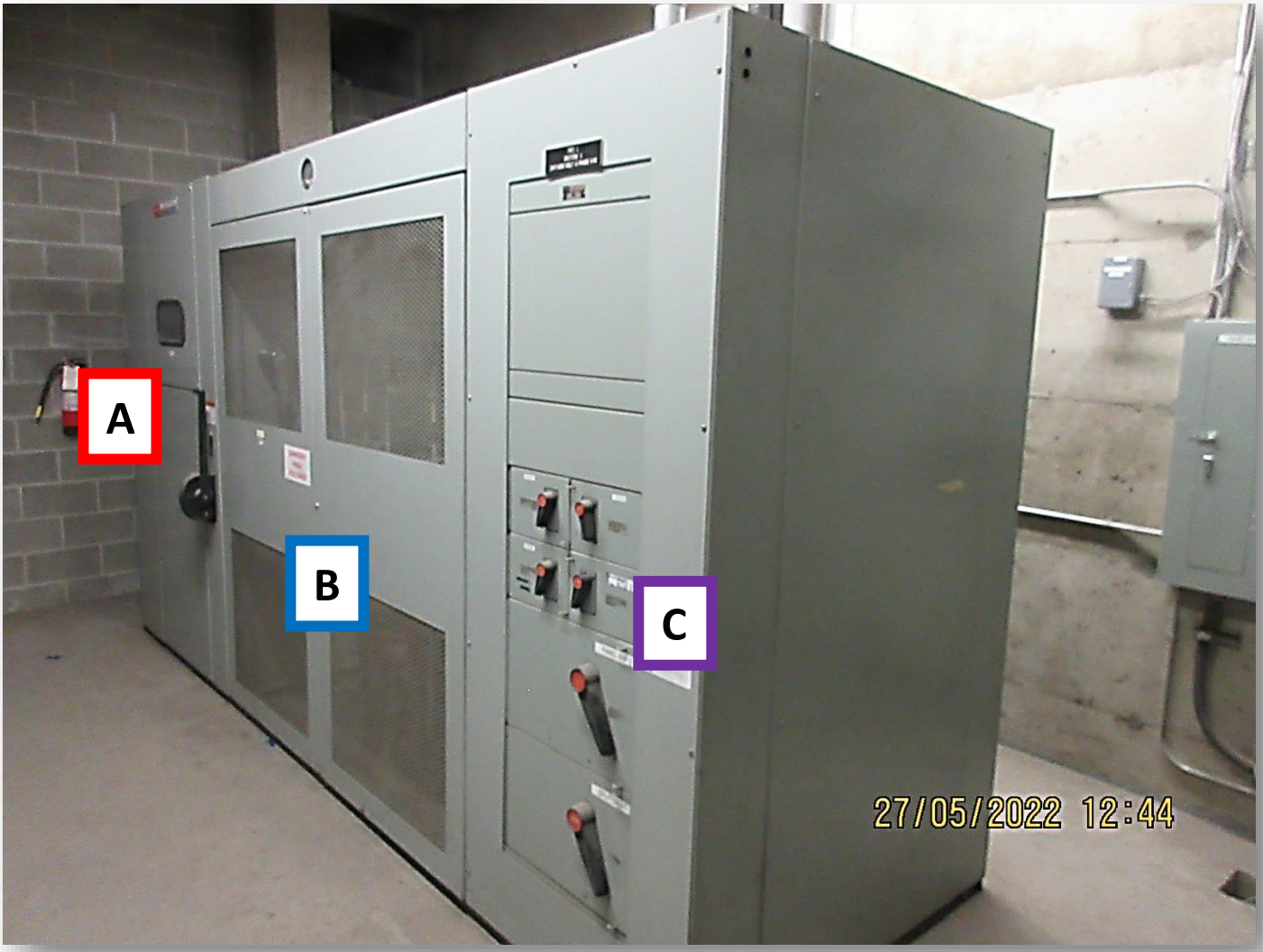

Photo 2 – Inside the electrical room/vault.

A. 12KV Load-break switch.
B. 1000KVA transformer.
C. 600volt Main Distribution Center.

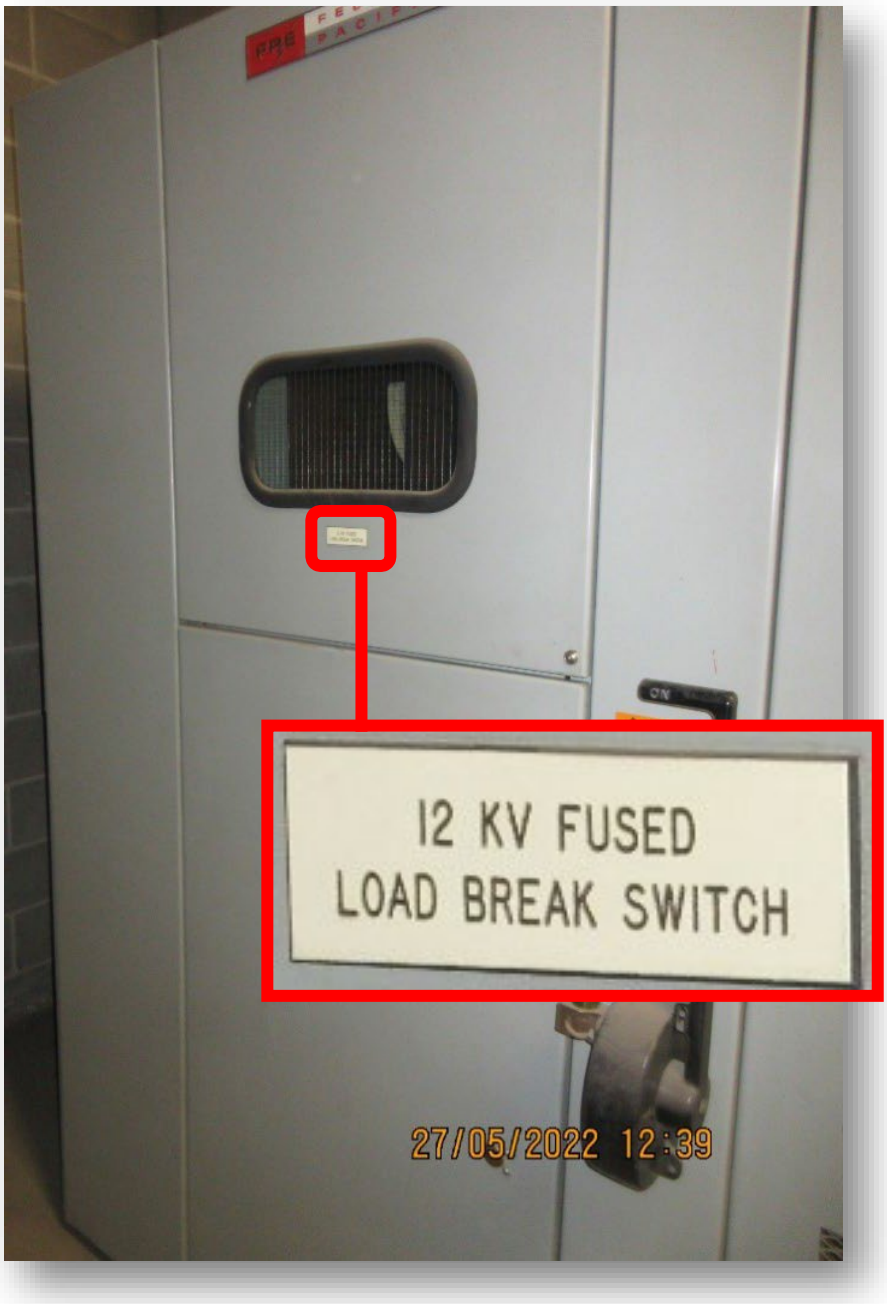

Photo 3 – 12KV Load-break switch compartment.