Incident Summary #II-1812919-2024 (#55410) (FINAL)

SUPPORTING INFORMATION	Incident Date		December 22, 2024
	Location		Langford
	Regulated industry sector		Electrical - High voltage electrical system (greater than 1000V)
	Impact – Injury	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Impact – Damage	Damage description	A fire was mainly contained to the components of a light-emitting diode (LED) illuminated sign area in a ceiling and wall around the front of a restaurant. Fire crews had to cut several holes into the exterior wall of the building during fire suppression efforts and had to tear down some drop ceiling tiles.
		Damage rating	Moderate
	Incident rating		Moderate
	Incident overview		A few years after the upgrading of a neon sign to a more energy efficient LED sign on the exterior of a business, an electrical fire occurred in the interior wall above the entrance/exit. This took place during dinner hour at a restaurant and included a disruption to dinner service operations when they had to evacuate the patrons from the restaurant and close the business.
INVESTIGATION CONCLUSIONS	Site, system and components		The restaurant location is franchise-owned but operates under contractual obligations from the franchisor to maintain a consistent brand aesthetic and implement required updates and upgrades as directed. • Traditional Neon Signage: These signs require a very high voltage lighting system over 1000-volts (typically 4,000 to 15,000 volts) to ionize the gas inside glass tubes and make them glow. This high voltage is achieved using a "step-up" transformer which increases the standard line voltage (120V-240V) to the necessary high voltage. • Light Emoting Diode Technology, (LED) signs operate on much lower voltages, typically 12- or 24-volts DC. They use a "step-down" power supply (or driver) to convert the standard line voltage down to this safer, lower energy efficient voltage. LED lighting technology is longer-lasting, durable, which are some reasons why it is a common upgrade for many businesses. Armoured cable is wiring covered in a metallic protective layer commonly used for protecting wiring in more extreme applications where mechanical damage, weather, and other factors are a concern. Externally, when neon signage is removed from a building it leaves penetrations in the building envelope that need to be sealed using equivalent means to prevent the ingress of moisture (Image 2).

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	Internally, when a conversion is performed from a neon sign to LED, it is effectively removing the old high-voltage "step-up" transformer and replacing it with a new low-voltage however the physical transformer does not need to be removed when properly de energized and disconnected, though the transformer remains present the cabling must either be adequately protected or removed to prevent potentially energized cables from posing an arcing hazard. "Step-down" power supply designed for LEDs. The "step up" aspect highlights the significant difference in power requirements and safety considerations between the two technologies.
Failure scenario(s)	The restaurant chain was established in 1964 and includes 365 restaurants located in every province and two out of three territories. A new restaurant franchisee had purchased the incident location and had contractual obligations to maintain a certain aesthetic. In 2023, the franchisee retained an installation contractor to remove the old neon sign from the exterior wall above the entryway at the restaurant to replace with an LED sign that was decommissioned from a different location. While the franchisor expects franchisees to retain contractors with proper permits, qualifications and certifications, franchisees are permitted discretion in engaging the specific contractors they wish to retain. The installation contractor then had two workers install the hardware and acquired the LED sign, fixing it to the exterior wall above the entryway of the business and wiring it for illuminated use. The installation contractor removed the old neon sign and installed the new sign without any contractor licence or certified workers to perform the regulated electrical work. The removal of the old neon signage from the building exterior left several dozen screw size penetrations (Image 2) in addition to the larger holes for wiring in the building envelope. The screw size holes are spread over a much larger surface area than the new LED signage (Image 2). These smaller penetrations were not sealed using equivalent means to prevent the ingress of moisture. Leaving unsealed holes in the building envelope can allow moisture to enter and collect inside the wall cavity. The presence of moisture can make formerly insulating materials electrically conductive. The armoured cable associated with the previously removed neon signage was left cut but connected to the secondary (high voltage side) of the transformer which was still connected to an active circuit inside an exterior wall cavity. Above the main entry doors with no protection on the ends. The energized conductors contacted likely wet structural and insulation materials inside the wall due to the penetrations in the envelope described above. This combination acted as an ignition source, resulting in a fire within the wall cavity producing smoke that could be seen on CCTV footage. Around this time staff and patrons could be seen in the busy main dining area becoming aware of a developing situation at the main entrance. It was observed after the incident that the branch circuit breaker had been tripped. A local off-duty firefighter dining at the restaurant was able to examine the area at the entrance and initiated fire suppression activities. The fire department was activated and arrived within a few minutes and patrons were safely evacuated.

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	During suppression, firefighters removed ceiling tiles and were able to document the existing cables and transformer as well as the original armoured cable which was severely burned (Image 3A and Image 3B). Fire in the surrounding area was contained in the effort due to the speed of the response. Portions of the outside of the building had to be removed for firefighting efforts as well (Image 1).
Facts and evidence	**Permits and Licencing** No permits were issued for any electrical work by the installation contractor. The installation contractor was not licensed in British Columbia to perform electrical work. **Understanding Franchisee Operations** A long-standing restaurant chain established in the 1960's has many policies and procedures in place for most foreseen upgrades and maintenance. Responsibilities are divided between the franchisor, where decisions are made on many aspects of the businesses aesthetic and layout, new construction and operational policy and procedures and the franchise owners who handle maintenance, human resources and other responsibilities. **Restaurant (Contractual Liability Policy) Franchisor** *Re: Contractual Enforcement:* 1. Despite the strict wording of the franchise agreement, franchisor does not enforce these requirements where the proposed work is not extensive in nature (e.g. only electric work, as versus a full renovation). While the franchisor is involved in larger projects such as the initial construction of a new restaurant or a full renovation of an existing restaurant, the general contractor for those projects controls the subtrades and manages local permitting requirements. Day-to-day building maintenance is generally left in the hands of the franchisees. Additionally, during COVID-19, the franchisor provided greater flexibility to franchisees regarding work being performed at franchised restaurants due to the extreme adverse economic consequences suffered by franchisees, the franchisor expects franchisees to retain contractors with proper permits, qualifications and certifications, franchisees are permitted discretion in engaging the specific contractors they wish to retain. 2. Franchisees must provide relevant documentation to the franchisor upon request, but this requirement is generally not enforced where the proposed work is not extensive in nature. *Insurance investigation following the Incident indicated that the Incident was not caused by a particular issue in the signage tower or the signage itself, rather, the likely cause was water ingress in the building or another issue in the backend electrics. - Provided information from Franchisor.*

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Codes, Acts and Regulations

Canadian Electrical Code (2024 version CSA C22.1:24)

12-114 Ends of insulated conductors

When the ends of insulated conductors at switches, outlets, and in similar places are not in use, they shall be insulated in the manner prescribed for joints and splices.

Safety Standards Act

SAFETY STANDARDS GENERAL REGULATION

Installation permits

17 (1) An installation permit is required to install or alter a regulated product.

(2) An installation permit may be issued to any of the following:

(a) a licensed contractor;
(b) a person who holds an operating permit;
(c) an owner of a regulated product;
(d) a homeowner who performs regulated work as permitted under the regulations.

12 (1) A person must obtain the appropriate permit from the regulatory authority before performing regulated work or using a regulated product unless exempted from doing so under the Act.

Installation and/or replacement of electrical light fixtures is regulated work that must only be done by a person with a certificate of qualification in the trade of electrician from a recognized training credential or under the direct on-site supervision of such person.

The work must be done under a valid electrical installation permit. The intent of the permit is to provide permission for the work after verification by the regulator that the individual has the qualifications necessary for the scope of work indicated.

A licensed contractor must not permit regulated work to be undertaken by persons under the control, contracted or employed by the licensed contractor if they are not authorized to do so.

Field Safety Representative (FSR) as per Canadian Electrical Code 2-304:

- An Electrical FSR is a person who is certified to make declarations that the work described in an electrical installation or operating permit complies with the Safety Standards Act and Electrical Safety Regulation.
- The responsible FSR, the contractor was required to be on-site/or to ensure work performed is being done by qualified personnel in a safe manner.

The FSR's duties outlined in the Safety Standard General Regulation include:

- Ensuring that the regulated work complies with all requirements under the Act.
- Ensuring that the persons performing regulated work under a permit have the qualifications that are appropriate for that type of work.

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Statements and Notes

Current Owner

- Took over ownership for this restaurant location on August 21, 2023".

2023 Sign Installation Company

- The company is not a licensed electrical contractor nor does anyone who works there have electrical certification.
- No official electrical qualifications of the person(s) who did the removal and installation of the signs but 10 years experience installing signs.

Employee – Labourer/Installer

- There have been a few more decommissioning and installation jobs as neon is being phased out to LED in many places.
- The two types of signage require different voltages, one higher than the other and a change in electrical features to operate is needed unless its new construction and the proper electrical has been done.
- Some electrical changes are necessary for the change.
- They are unsure about the electrical regulations and permit requirements.
- They typically shut the breaker off for the change then turn it back on to test new installations.
- Removing LED signage can leave holes in the envelope. Larger holes are typically filled with silicone.

Electrical Field Service Representative – Post Incident Notes

- The new LED sign had been connected to a branch circuit cable that was sourced from an existing junction box above the drop ceiling that was not connected to the old neon signage supply circuit.
- The branch circuit supplying the old neon signage above the main entrance was still connected to an active circuit breaker and the associated cabling from the secondary (high voltage) side of the transformer was capable of being energized; the branch circuit breaker had been tripped.
- The permanent disconnection or guarding of electrical equipment not in service is a requirement under the Canadian Electrical Code (CEC2-200, CEC2-300).

City of Langford

The fire department attended a fire at the location and found a fire between the exterior and interior wall. The point of origin of the fire was the metal protected electrical cable. That cable previously powered the exterior neon sign that had been removed.

Safety Officer Notes

The existing high voltage cabling was connected to the neon sign transformer and is cut and left energized inside wall space with no protection on ends of conductors. Energized conductors made contact with flammable materials inside wall and started a fire. There were no permits found.

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	CCTV Footage • Showed progression of the fire which was first identified in the entryway ceiling between the two sets of doors. • Shows firefighter patron intervening. • Shows evacuation.
Causes and contributing factors	The fire was caused by an open ended energized armoured cable for a previously removed neon sign that produced an arcing fault within the exterior wall cavity. Other contributing factors: • An ingress of moisture through the building envelope allowed for materials with insulating properties to become conductive. • Failure to protect or decommission, energized conductors in an approved manner. • Uncertified sign installers performing regulated electrical work-labourer/installer was unsure of the risk of the scope of tasks involved in the work and the permitting and certifications required for them.

All images below are provided by the Langford Fire Department.

Image 1 – Burn damage from outside.

Image 2 – The circled items throughout the image shows some of the screw holes that were left in the envelope from several years prior when neon sign was removed.

Image 3A – Conductive wiring not terminated.

Image 3B – Conductive wiring not terminated.

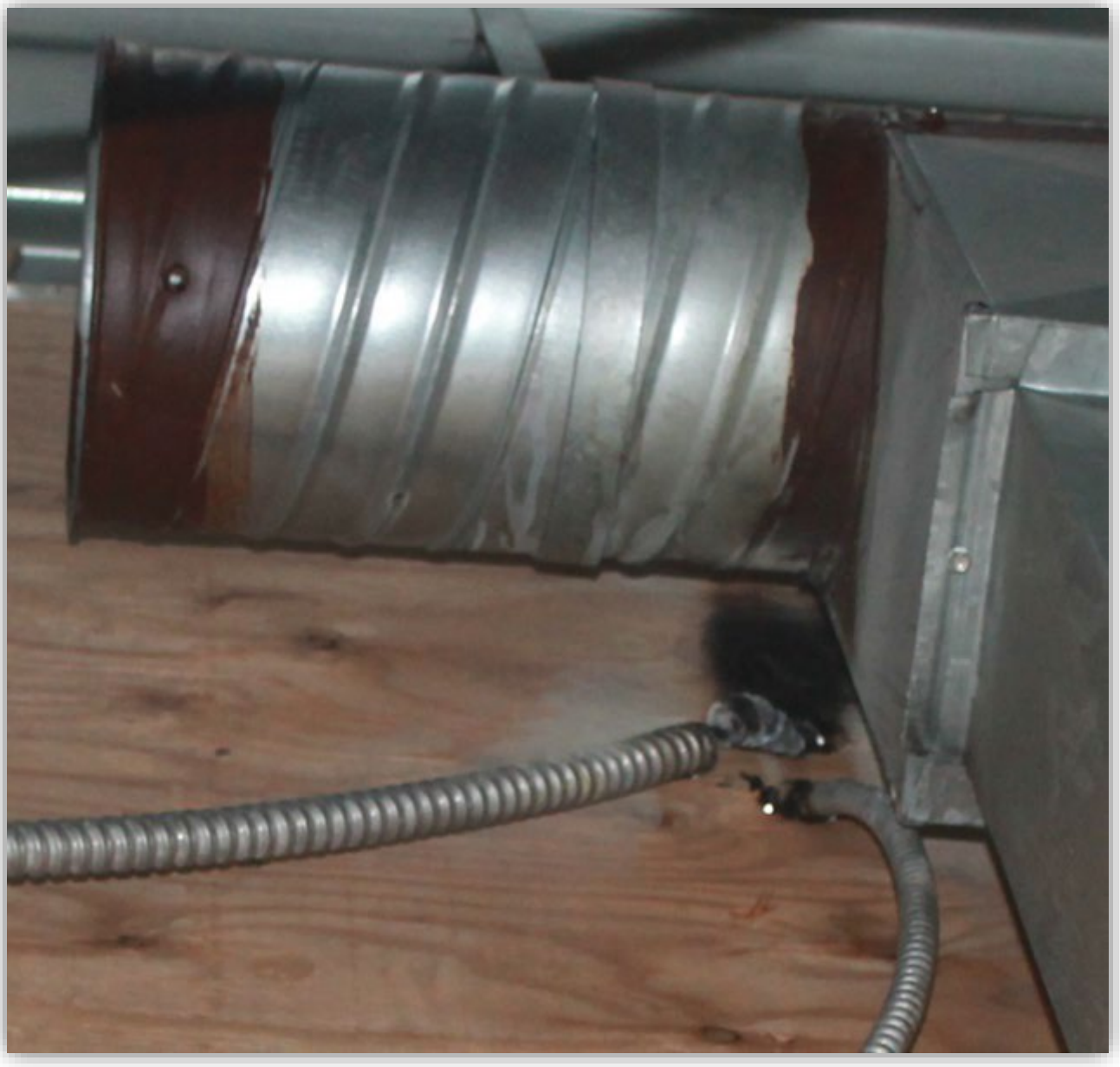

Image 4 – Fire area from inside wall of restaurant.

Image 5 - Burnt wiring.