

Incident Summary #II-1722810-2024 (#47597) (FINAL)

SUPPORTING INFORMATION	Incident Date	June 13, 2024	
	Location	Trail, BC	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 1000V)	
	Impact	Qty injuries	1
		Injury description	Worker was preparing to apply grease to machinery when, while reaching in, his arm contacted an abraded, energized cable supplying a 600V AC equipment drive motor.
		Injury rating	Minor
	Damage	Damage description	N/A
		Damage rating	None
Incident rating	Minor		
Incident overview	At an industrial facility, temporary wiring used to supply electrical energy to an equipment drive motor had deteriorated; the cable jacket abraded and exposing internal conductor insulation to further abrasion and consequential exposure of the energized conductor and electric shock to a worker.		
INVESTIGATION CONCLUSIONS	Site, system and components	<p>The facility employs 600V AC drive motors throughout the site, various horsepower sizes in various applications. Occasionally, temporary installations are completed to manage equipment failures, or to support alterations to the industrial process. Typically, the temporary installations are either removed or altered to reflect a permanent installation.</p> <p>The CSA C22.1 Canadian Electrical Code Part 1 contains the following clauses applicable to the installation and operation of temporary wiring:</p> <ul style="list-style-type: none"> • 2-200 states that general electrical equipment shall be installed and guarded so that adequate provision is made for the safety of persons and property and for the protection of the equipment from mechanical or other damage. • 2-300 states that for maintenance and operation, all electrical equipment shall be kept safe and in proper working condition, and infrequently used electrical equipment is maintained for future service and shall be thoroughly inspected before use in order to determine its fitment for service. • 12-402 states that flexible wiring shall not be used as a substitute for the fixed wiring of structures. • 76-010 states that feeders for temporary wiring shall be protected at all times from mechanical damage. 	

<p>Failure scenario(s)</p>	<p>A 600V AC equipment drive motor had been installed for a temporary application. A length of SOW type flexible cord was used as a temporary wiring method for the electrical supply. The temporary application was not adequately protected, never removed, never modified to reflect a permanent installation. Over time, the SOW flexible cord outer jacket and conductor insulation abraded while the machinery operated exposing the energized conductor. An employee was greasing a component near the electric motor and made contact with the damaged section of the cable and received an electrical shock.</p>
<p>Facts and evidence</p>	<p>Statements and images from the facility where shared and the data and information has been used to document the incident. The data and images identify:</p> <ul style="list-style-type: none"> • The motor was temporarily wired using flexible cable and was not changed to permanent wiring. • The location of the worker was by the motor when they were shocked. • The cable was found to have had a damaged outer jacket in the area the worker contacted it. • The insulation of one conductor inside the cable was found to be damaged as well exposing the energized wire inside. • The motor supply is 600V 3ph and the worker would have received a potential of up to 347V to ground from the one damaged conductor.
<p>Causes and contributing factors</p>	<p>Evidence determined the incident was caused by an exposed, energized conductor contacting the forearm of an employee while the individual was performing routine equipment maintenance.</p> <p>A failure to replace the temporary installations with permanent wiring and the flexible corbel not being adequately protected from damages contributed to the incident.</p>

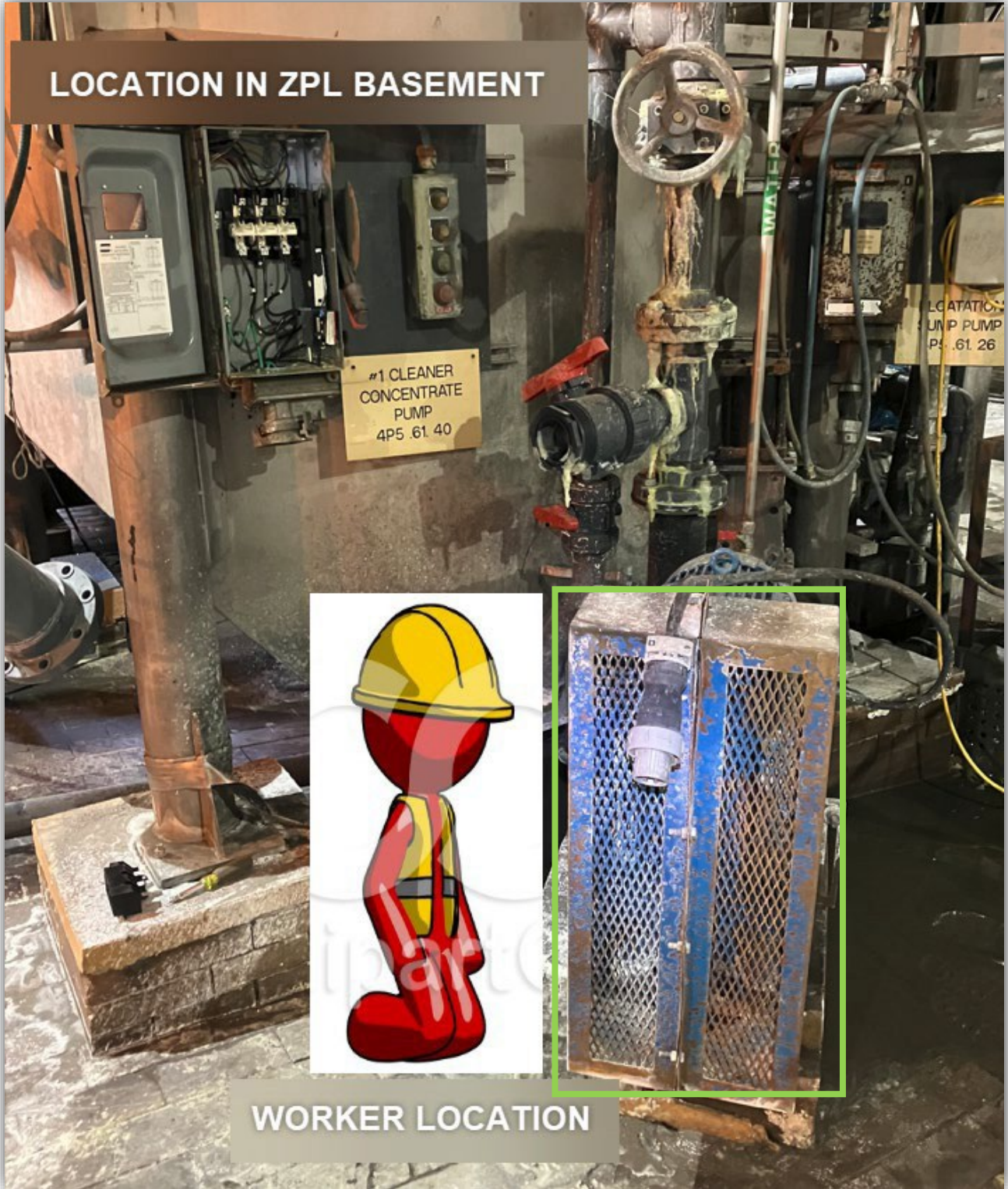


Image 1 - Temporary drive motor and the location of the worker when incident happened.



Image 2 – Worker positioning.

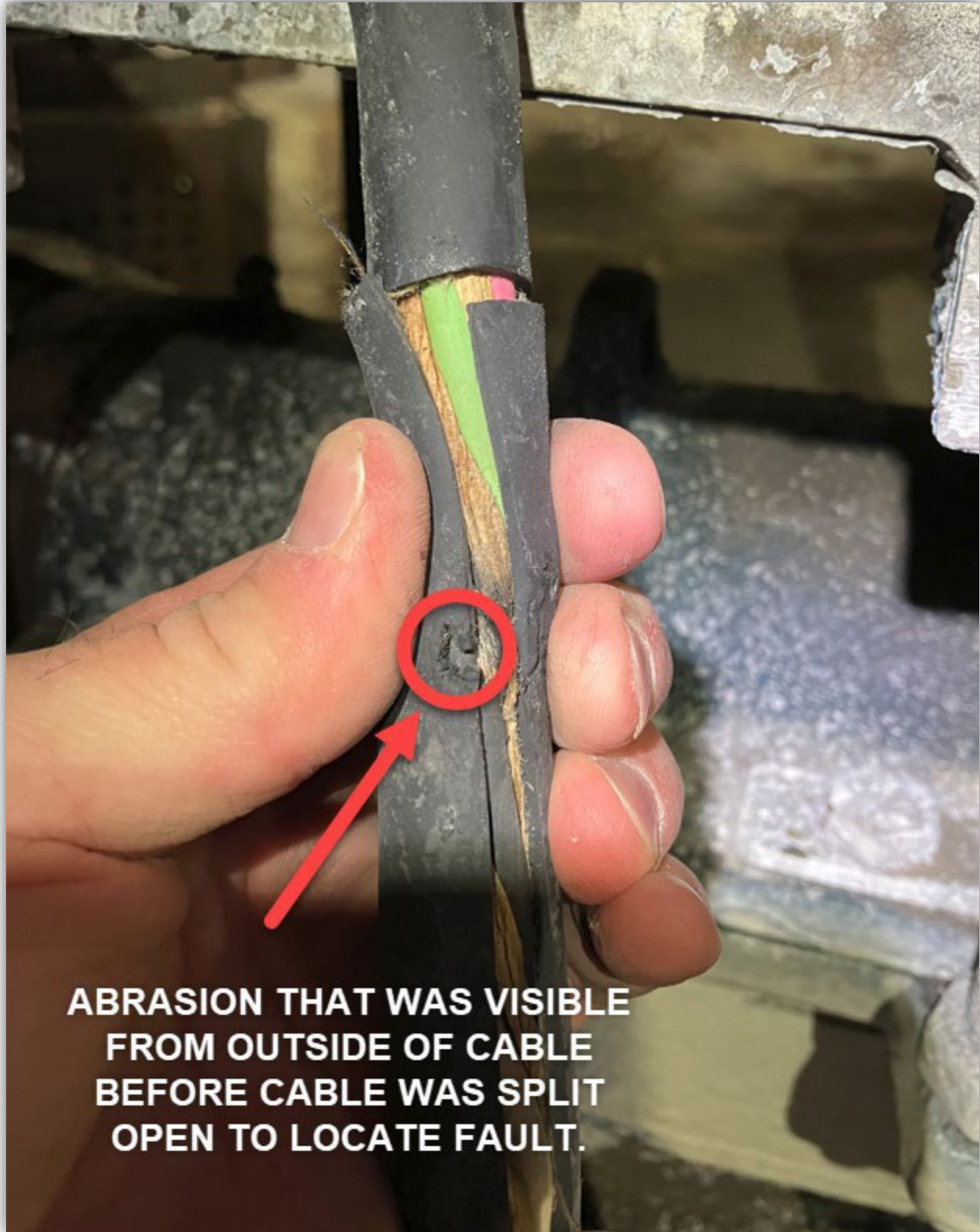


Image 3 – Abrasion on outside of cable.

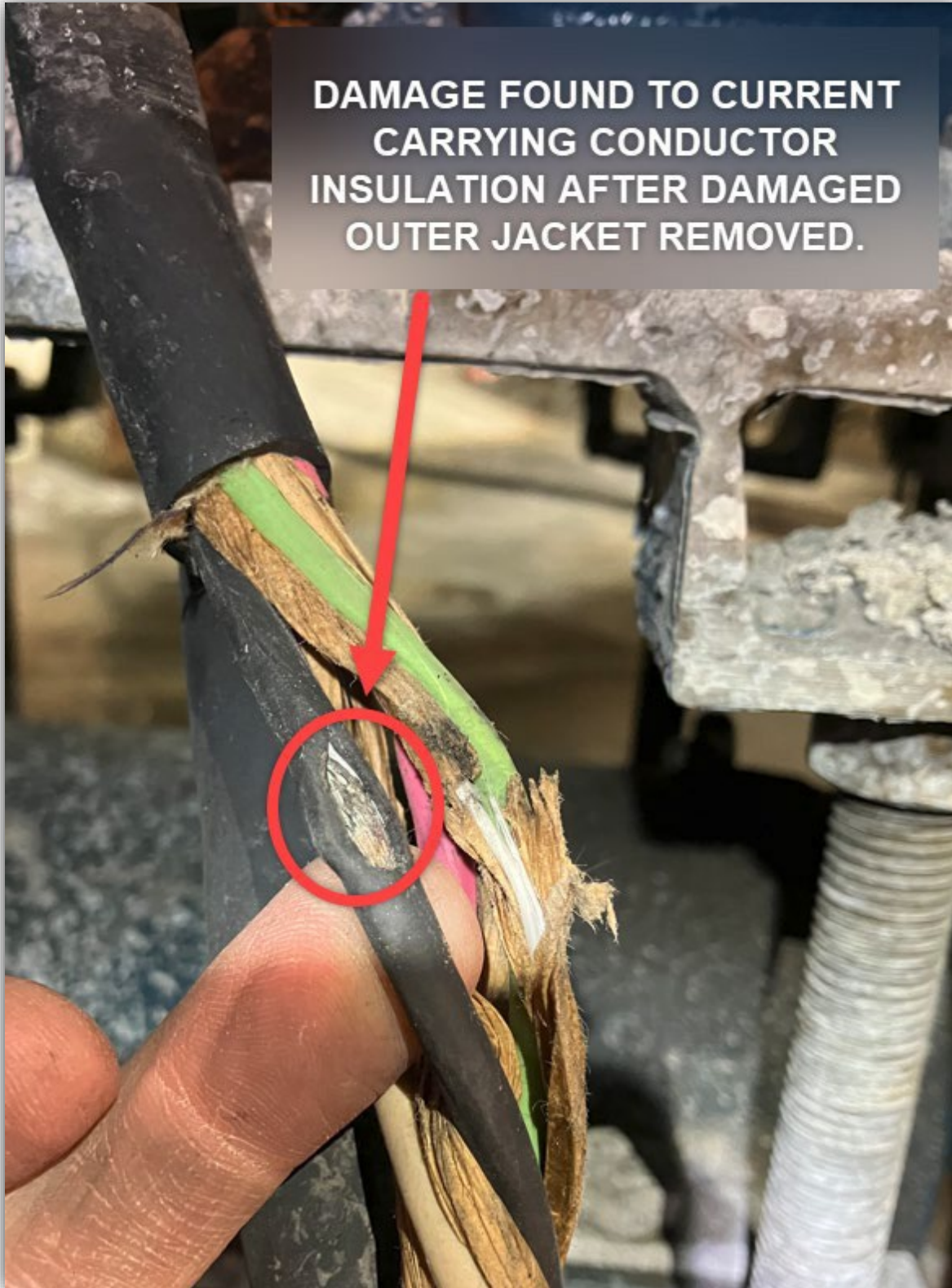


Image 4 – Damage found.