

Incident Summary #II-1604791-2023 (#39000) (FINAL)

SUPPORTING INFORMATION	Incident Date	September 14, 2023	
	Location	Mission	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Damage	Damage description	Outer jacket burned, crimp from utility melted and minor fire damage to the wooden building structure and wooden service post. Damaged overhead consumer service cable insulation and utility connection point.
		Damage rating	Minor
	Incident rating	Minor	
	Incident overview	The connection point from the utility supply conductor to the main consumer service conductor failed and ignited accumulated wood dust between the roof and soffit area at a pallet manufacturing facility.	
INVESTIGATION CONCLUSIONS	Site, system and components	<p>Site:</p> <ul style="list-style-type: none"> A pallet manufacturing facility with lighting and wood manufacturing equipment such as saws, compressors, dust collectors. <p>Components:</p> <ul style="list-style-type: none"> 400 Amp, 120/208 Volt, 3 Phase, overhead service. Appears to be 4/0 AWG single conductor, armoured cables installed from the service connection point to the 400 Amp fused service switch located inside the building. Utility quadruplex cable supply service cable installed overhead from the utility pole to the connection point at the building. Type H compression crimp between the supply service and consumer service conductors. 6 X 6 treated wood service cable support post. <p>Normal Operation:</p> <ul style="list-style-type: none"> The compression crimp provides a connection point between the utility overhead conductors and the consumer service conductors. Service conductor connections that are not properly installed or become loose can cause connections to degrade resulting in overheating. It has been confirmed this type of connector is approved for copper to aluminum connections. 	
	Failure scenario(s)	<p>Over time, the overhead utility supply conductors and service conductors became loose and heat was likely building up eventually to the point where the crimp failed.</p> <p>When the crimp melted, and the service conductor overheated molten aluminum and copper likely fell into the opening around the service post. Wood dust may have been collecting there and was ignited.</p>	

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Facts and evidence	<p>Forklift operator statement:</p> <ul style="list-style-type: none">• While driving the forklift through the yard he observed smoke coming out from the roof line below the service cables. <p>Fire fighter statement:</p> <ul style="list-style-type: none">• When the soffit was removed there was a pile of smoldering wood dust between the roof and the soffit in the immediate area directly below the melted service connection. <p>Safety Officer(s) observations:</p> <ul style="list-style-type: none">• The area had little to no precipitation in the month prior to and at the time of the incident.• Wood dust was built up on the roof. The wood dust in the area was very dry.• Signs of melting copper and aluminum on the cable and compression crimp.• Fire damage on the post between the roof and the soffit observed.• Utility indicated the crimped service connections were made in 2002.• After the incident and service repair load testing was conducted by the site operating permit electrician and was measured at 400A inrush, and 185A running current. Phase loading was determined to be relatively balanced.• Dry wood dust was observed.
Causes and contributing factors	<p>It's likely that loose service conductor connections combined with loading on the service conductors overheated and melted the service conductor connections, copper and aluminum service conductors, and conductor insulation. Hot material dripping into the roof/soffit area ignited dry wood dust.</p> <p>A contributing factor may have been warm dry weather, prior to the incident, drying the accumulated wood dust that had collected inside the soffit area below the melted connections.</p>



Image 1 – Soffit removed by the fire department.



Image 2 – Pallet manufacturing facility.

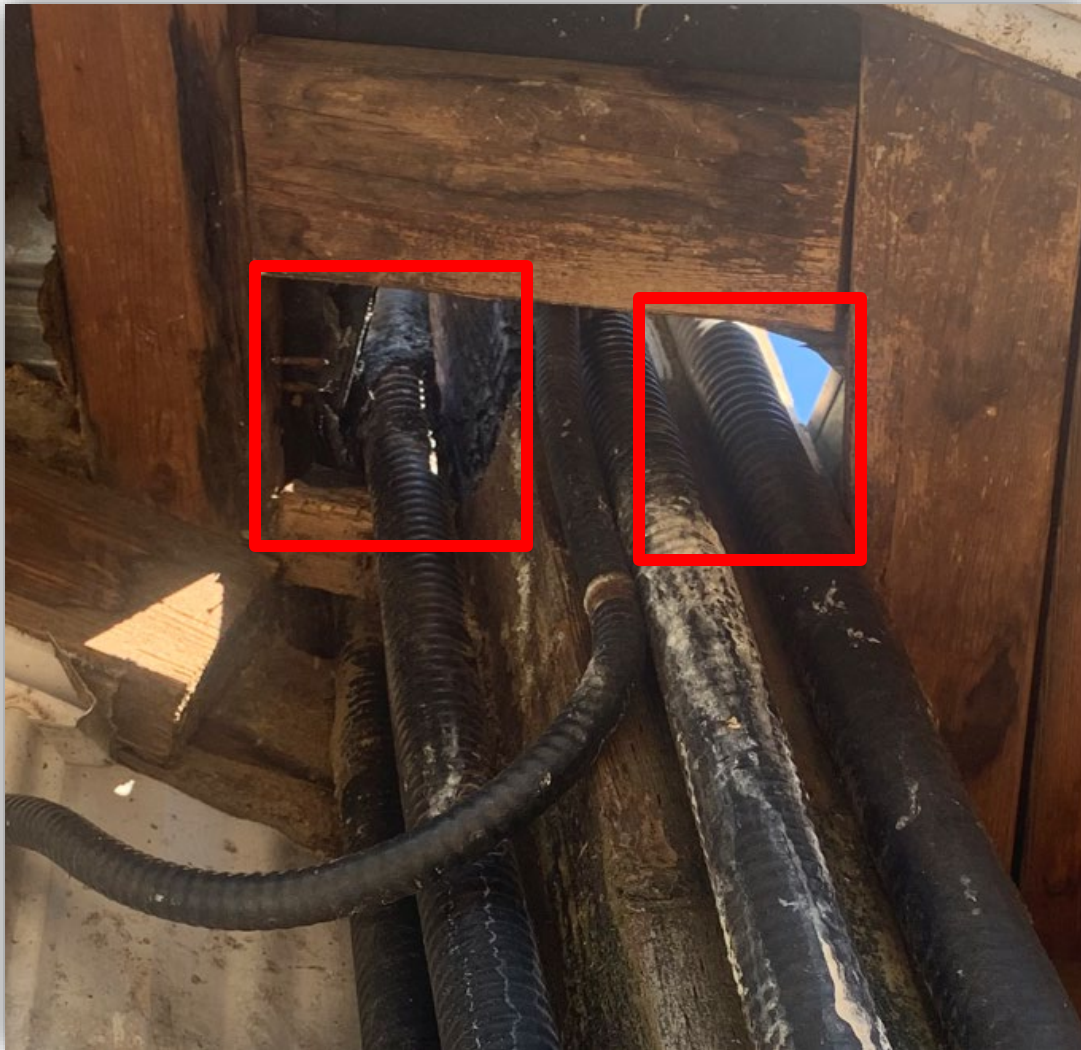


Image 3 – Gaps for dust to enter between the roof and the soffit.



Image 4 – Soffit removed by the fire department.



Image 5 – Dust accumulated on the roof.



Image 6 – Molten drips and melted insulation.



Image 7 - Failed crimp.

49.02 °N, 122.32 °W

Abbotsford, British Columbia, Canada Weather Calendar

3° ABBOTSFORD INTERNATIONAL AIRPORT STATION | CHANGE

TODAY

HOURLY

10-DAY

CALENDAR

HISTORY

WUNDERMAP

September

2023

View

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
27 Mostly Sunny Actual: 32° 15° 0 mm	28 Mostly Sunny Actual: 21° 15° 0 mm	29 Cloudy Actual: 17° 15° 0 mm	30 Mostly Cloudy Actual: 21° 14° 0 mm	31 Mostly Cloudy Actual: 22° 14° 0 mm	1 Mostly Sunny Actual: 29° 13° 0 mm	2 Mostly Sunny Actual: 29° 12° 0 mm
3 Scattered Showers Actual: 21° 14° 0 mm	4 Cloudy Actual: 18° 13° 0 mm	5 Partly Cloudy Actual: 20° 14° 0 mm	6 Mostly Cloudy Actual: 21° 10° 0 mm	7 Foggy Actual: 19° 11° 0 mm	8 Mostly Sunny Actual: 23° 10° 0 mm	9 Mostly Sunny Actual: 28° 9° 0 mm
10 Mostly Cloudy Actual: 25° 11° 0 mm	11 Mostly Cloudy Actual: 22° 15° 0 mm	12 Cloudy Actual: 18° 14° 0 mm	13 Mostly Cloudy Actual: 23° 13° 0 mm	14 Mostly Sunny Actual: 26° 10° 0 mm	15 Mostly Sunny Actual: 28° 10° 0 mm	16 Mostly Cloudy Actual: 24° 9° 0 mm

Image 8 - No significant rain in the weeks prior to the incident.
(Taken from <https://www.wunderground.com/calendar/ca/abbotsford/CYXX/date/2023-9>)

Compression H-tap connectors

Type WR – Wide range aluminum tap connectors “N” die for hydraulic tools, 12-ton and greater



- For combinations of aluminum-aluminum and aluminum-copper conductors
- Pass the requirements of ANSI C119.4
- Standard compression tools and dies install all sizes
- Seven Connector Program provides superior connector performance, lower connection costs and simplified installation procedures
- Fold-in tabs provide positive tab interlock as tool closes
- Field-proven ribbed design provides unparalleled connector/conductor contact, without distorting the conductor's shape
- Made of 1350 aluminum alloy
- Pre-filled with an oxide inhibitor which is held captive in the rib/connection area
- For copper-to-copper combinations, use CF type shown on page 11

Type WR – Wide range aluminum tap connectors “N” die for hydraulic tools, 12-ton and greater

Image 9 - Compression crimp is approved for copper and aluminum connections.