Incident Summary #II-1672194-2024 (#44242) (FINAL)

SUPPORTING INFORMATION	Incident Date		January 29, 2024
	Location		Prince George, British Columbia
	Regulated industry sector		Electrical - Low voltage electrical system (30V to 1000V)
	Impact – Injury	Qty injuries	1
		Injury description	A worker came into contact with a damaged electrical cable feeding an electric crane, receiving an electrical shock.
		Injury rating	Major
	Impact – Damage	Damage description	A flexible cable was damaged, exposing an energized conductor.
		Damage rating	Major
	Incident rating		Major
	Incident overview		A flexible electrical cable, fed from a 3 Phase 600 Volt 60 Amp disconnect and feeding an electric crane, sustained damage to the outer jacket and inner conductor sheath exposing the energized copper conductor. The cable was run along the floor to the edge of the lifting bay, then draped over the handrail into the lifting bay, up to the crane to retain the flexibility required. A worker was operating the crane using the control pendant, and while looking over the lifting bay, contacted the exposed, energized conductor, receiving an electrical shock.
INVESTIGATION CONCLUSIONS	Site, system and components		Overhead cranes are used to lift heavy or awkwardly sized items to operating floors located above grade and can be utilized to work above other equipment. In this instance, a 600 Volt 3 Phase overhead crane on a rail system was utilized for lifting 3 stories through a lifting bay to an operating floor. The crane could also operate along a curved rail over an adjacent conveyor system on the operating floor. A fused 600 Volt 3 Phase disconnect with 60 Amp fuses supplied power to the crane. Cranes require the power feed cable to be movable to follow the trolley along the rails. This can be done using conductor bars, festoon cables or flexible cable with a take-up device. Power was fed to the crane via a 4-conductor copper SOOW-type extra hard usage flexible cable.
	Failure scenario(s)		This crane system was not equipped with a take-up device as required to protect the slack cable from damage. The cable had a slice in the outer jacket, penetrating through the insulation of one of the phase conductors, exposing the bare copper. When the individual came into contact with the bare energized conductor, they became the path to ground, causing the electrical shock.

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Facts and evidence	The cable was viewed in the approximate location to contact the worker as they leaned over the railing at the lifting bay edge (Image 1). The cable was shown with damage and an exposed energized conductor (Image 2 & Image 3). The crane was not provided with a take up device for cable slack. The cable was run along the ground to the disconnect.
Causes and contributing factors	It is highly likely that the power feeder cable slack not being taken up allowed the worker's body to contact the exposed energized conductor while guiding the crane hook through the lifting bay. An auto take-up device could have potentially prevented the cable from being damaged. The cable damage was likely caused when the crane moved past a piece of stationary equipment while dragging the cable. The cable likely was dragged across a sharp edge, creating the slice.

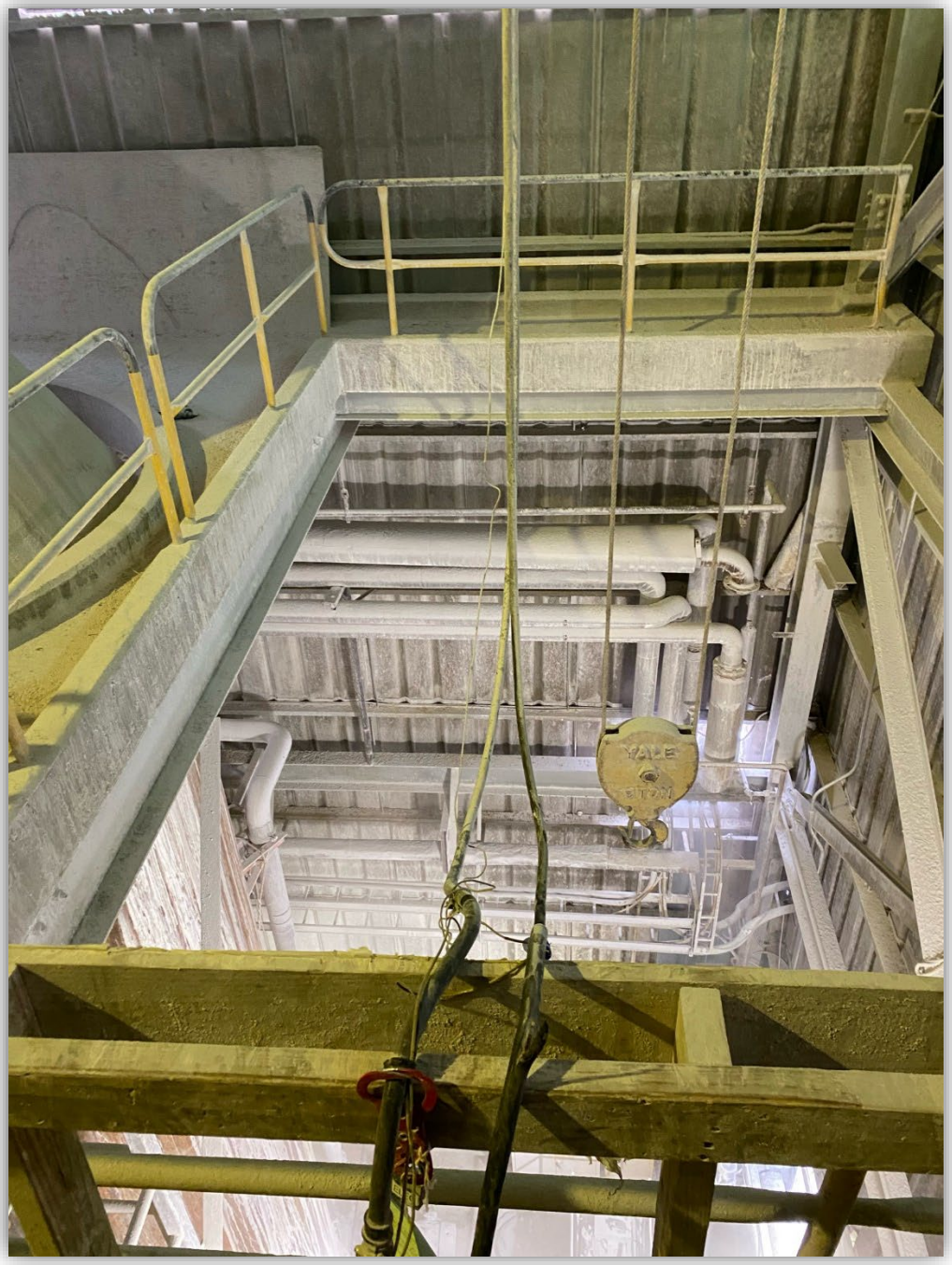

Image 1 - Crane lifting bay with damaged cable and control pendant in the approximate location & position when incident occurred.

Image 2 - Close-up of cable damage and exposed conductor.

Image 3 - Close-up of cable damage and exposed conductor.