

Incident Summary #II-1011125-2020 (#17192) (FINAL)

SUPPORTING INFORMATION	Incident Date	May 6, 2020	
	Location	Interior	
	Regulated industry sector	Passenger ropeways - Above surface ropeway	
	Impact	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Damage	Damage description	Haul rope abrasion, bent grip jaw and the work carrier platform and hanger bent and twisted. Deformation of the top terminal door closing mechanism.
		Damage rating	Moderate
	Incident rating	Moderate	
	Incident overview	During maintenance work, while ropeway was closed to public for the season an unoccupied work carrier came into terminal too fast and became entangled with terminal door closing device.	
INVESTIGATION CONCLUSIONS	Site, system and components	The pulsed ropeway carries passengers in an arrangement of 3 gondolas grouped together, a pod. The pod is fixed to the haul rope and another pod is fixed symmetrically to the first pod, balancing the ropeway. As pod 1 is at the bottom terminal, pod 2 will be at the top terminal. The ropeway operates continuously in one direction, slows as the pods approach the terminals and accelerates as the pods depart terminals. The ropeway speed changes (pulse) for pod terminal entry and exit and is controlled at the drive (bottom) terminal only. A support rail is in place for gondola cabins, to prevent cabin movement as passengers load and unload. The work carrier, a separate carrier than those used to transport passengers, is designed for maintenance personnel to service rope line equipment. It is not outfitted for use with the terminal support rail and must not be installed on ropeway during regular operation.	
	Failure scenario(s)	Maintenance staff installed the work carrier on the haul rope ahead of a pod at the bottom terminal and operated the ropeway. The work carrier arrived at the top terminal and because the pod travelling downhill had yet to reach the bottom terminal the ropeway did not slow down. The work carrier contacted the top terminal.	
	Facts and evidence	Ropeway Specifications: <ul style="list-style-type: none"> 3.0 m/s operating speed while pods are between terminals 	

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- The ropeway speed reduction for carrier approach and travel through terminal is done at bottom terminal only
- No carrier speed reduction safety monitoring device at top terminal
- Work carrier is not held captive, unlike gondola cabins as they travel through terminals
- Load Test stop distances at 3.0 m/s:
Normal stop - 7.95 m
Service Stop - 7.1 m
Emergency Stop - 5.35 m

CSA Z98-14 requirements:

- Carrier speed shall not be faster than 1.3 m/s during loading and unloading of foot passengers
- Ropeways that operate at 3.0 m/s must have a stopping distance within 3-15m

Manufacturer manual:

- Work carrier designed to service ropeway tower line equipment
- Do not use work carrier alone on the lift line
- When work carrier approaches terminal ropeway speed shall be reduced to prevent terminal contact
- Work shall not be attached to haul rope while in normal operation

Wire Rope Specialist:

- Haul rope pulled through grip for 1.17 m
- Disturbed area cleaned and hardened surfaces were buffed out
- No damage detected by the Magnetic Rope Test
- Recommend maintenance personnel lubricate and visually inspect weekly during operating season.

Events of incident reported by contractor representatives:

- The gondola pods were parked halfway up/down on ropeway, as usual
- The empty work carrier was installed on the uphill side haul rope of the bottom terminal
- Ropeway was started to bring downhill gondola pod to bottom terminal for removal
- After removal of downhill pod, ropeway was started on slow to bring the uphill pod to the bottom for removal.
- Upon visual confirmation of pod clear of top terminal, operators used signalling communication and put ropeway into normal operating speed.
- Top operator noticed the work carrier arriving at the uphill side of top terminal at full operating speed, pressed normal stop button inside shack.
- Work carrier became entangled with cabin door closing mechanism on downhill side of top terminal

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Causes and contributing factors

Running the work carrier through the top terminal at operating speed caused the work carrier to impact the terminal. Damaging the work carrier, the terminal door close mechanism and haul rope abrasion. Positioning the work carrier to be alone and in a place where the ropeway would not automatically slow upon approach of top terminal is certainly a contributing factor.



Entangled Work Carrier with Terminal