

## Incident Summary #II-976334-2020 (#16544) (FINAL)

|                           |   |  |  |
|---------------------------|---|--|--|
| SUPPORTING INFORMATION    | Incident Date   | February 5, 2020   |  |
|                           | Location  | Surrey, BC   |  |
|                           | Regulated industry sector   | Elevating devices - Construction / personnel hoist/ man lift   |  |
|                           | Impact  | Qty injuries   | 1  |
|                           |   | Injury description   | Dislocated elbow and arm fracture.       |
|                           |   | Injury rating  | Moderate                                 |
|                           | Damage  | Damage description   | Leveler component destroyed in incident. |
|                           |   | Damage rating  | Major                                    |
|                           | Incident rating   | Major  |  |
| Incident overview         | During a personnel hoist extension, required slacked rope became unknowingly snagged on adjacent equipment. The slacked rope was snagged as the hoist's car began driving down, which resulted in the component that anchors the rope to the top of the car (known as a leveler) to fail. Due to the extreme tension the leveler was under, the leveler was launched upwards and into the arm of a mechanic resulting in an arm injury. |  |  |
| INVESTIGATION CONCLUSIONS | Site, system and components   | This unit was a counter-weighted personnel hoist. Geared motors are mounted on the car mates with a geared rack that extends the height of the construction mast. A counterweight (2.6 tonne) offsets the weight of the car and associated load. It is attached by a cable to the top of the car (leveler) via a pulley (cathead) located at the top of the mast. The entire length of cable required for the completed height of the building is stored on a spool and located on the top of the car. As additional floors are added to the building, mechanics unspool cable to achieve the required length between the car and counterweight, as the mast increases in height. This task is colloquially called an extension.   |  |
|                           | Failure scenario(s)   | This incident took place while three mechanics were in the process of an extension. This was performed by mechanics driving the car to the top of the mast allowing the counterweight to rest on the buffers in the pit, eliminating the tension in the rope. The mechanics unspool the desired length of cable from the spool to accommodate the added height of the mast. While the rope was slack, it managed to get snagged on equipment on the adjacent car (twin cars sharing the same mast) which was parked at the bottom landing. After the mechanics had completed the rope extension, they began to take up the slack of the rope by driving the car down. Not realizing the slacked rope was snagged, they continued driving down which resulted in the component that anchors the rope to the top of the car (known as a leveler) to catastrophically fail. Due to the extreme tension the leveler was under, the leveler was launched upwards and into the arm of a mechanic, resulting in fracturing their arm and nearly falling off of the car top. The two other mechanics restrained the injured mechanic and lowered them to the nearest landing where medical attention was sought. |  |

## Incident Summary #II-976334-2020 (#16544) (FINAL)

|                                 |  |
|---------------------------------|--|
| Facts and evidence              | Interviews with the non-injured mechanics involved indicate that they did not have personnel positioned at the bottom landing to visually verify the slack ropes were free of any snags when they began to move the car downwards following the extension. It was unable to be verified if the leveler in this incident was modified, as it was destroyed in the incident. The elevating device contractor has subsequently designed a more robust version of the original leveler which are used in the remaining cars that use counterweights. |
| Causes and contributing factors | It is probable that not having personnel stationed at the bottom landing contributed to the snagged rope not being identified by those at the top of the car. It is possible that the contractor's policy did not include the requirement to have personnel situated at the bottom landing during extensions. It is plausible that the manufactured components were modified, which could have affected the integrity of the equipment.  |



Image 1 - A typical "Leveler" unit that attaches to the top of a construction hoist cab.





Image 2 - The attach point of a typical “leveler”.





Image 3 - The “leveler” involved in incident.





Image 4 - Close-up of "leveler" and failure point.





Image 5 - Another “leveler” that potentially may have been modified by field personnel.