## Incident Summary #II-871224-2019 (#13788) (FINAL) *Revised August 6, 2020*

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| SUPPORTING INFORMATION | Incident Date | | May 11, 2019 |
| | Location | | Interior British Columbia |
| | Regulated industry sector | | Amusement Devices - Zip line |
| | Impact – Injury | Qty injuries | 1 |
| | | Injury description | Participant sustained superficial lacerations to the face, deep bruising to back of head and neck, spinal shock, concussion and whiplash symptoms. |
| | | Injury rating | Moderate |
| | Impact – Damage | Damage description | None |
| | | Damage rating | None |
| | Incident rating | | Moderate |
| | Incident overview | | The active dynamic primary brake system for the zip line became fixed in place causing an instantaneous stop of the rider. |
| INVESTIGATION CONCLUSIONS | Site, system and components | | Riders are dressed in a harness tethered to a trolley that travels on top of the main zip line wire cable, the lanyard (tether) allows riders to rotate. Riders "zip" from an elevated (departure) platform to a lower (arrival) platform. The departure platform and arrival platform have trained guides positioned to manage zip line riders. The departure guide dispatches (launches) participants upon confirmation from the arrival guide that they are ready to receive the rider. The arrival guide will control the primary braking system of participants as they approach the arrival platform. The primary brake system consist of a rope, pulleys and brake block that "catches" the riders zip line trolley and slows down the rider as they approach the arrival platform. This dynamic braking system must be repositioned by the arrival platform guide after each use. |
| | Failure scenario(s) | | The normally dynamic primary braking system became fixed. The zip line participants trolley impacted the now immovable brake block. The rider swung up and hit the zip line cable and rebounded away from the arrival platform, settling at the lowest point of the zip line. |
| | Facts and evidence | | *As reported by the arrival guide:*<br>• Rope for controlling primary brake system became locked<br>• Rider came in backwards<br>• Rider came to an abrupt stop and swung upwards as their trolley contacted the brake block |

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| | • Rider trolley was not retained by the brake block<br>• Rider rolled back out on the zip line away from the arrival platform<br>• Arrival guide performed retrieval of the injured rider as the rider came to a stop away from the arrival platform<br><br>*As reported by Witnesses*:<br><br>• Rider was travelling down zip line cable prior to arrival guide re-setting the primary brake system<br>• Arrival guide realized brake system was jammed and tried to free brake equipment before rider arrived<br>• Rider came in backwards to an immobile brake block, Rider swung up, rebounded away from brake system and rolled back away from arrival platform<br>• Rider came to a stop away from arrival platform<br>• Arrival guide retrieved dangling rider<br><br>*As reported by the injured participant:*<br><br>• Riding zip line facing backwards<br>• Hit across the left side of face by components of zip line<br>• Sustained bruising and cuts along forehead, bridge of nose, mouth and chin<br>• Badly bruised on and behind left ear down to neck<br>• Experienced spinal shock, concussion and whiplash symptoms<br><br>*As reported by the Zip Line Designer:*<br><br>• Operational best practice - the primary brake system shall be set prior to sending a rider<br>• Set position of primary brake shall be where the internal friction of the system shall slow the rider prior to contacting the emergency brake if arrival guide becomes incapacitated<br>• Additional guarding to be added to “brake block” to help prevent rope lock<br><br>*As observed by Safety Officer during Zip Line tour:*<br><br>• Arrival guide would instruct departure guide when the zip line is clear and to launch rider as soon as arrival platform was clear of previous rider<br>• Primary brake system was not in the set position to slow the rider prior to the rider being launched<br>• Zip Line cable may jostle as rider is launched and rides down zip line cable |
| Causes and contributing factors | The immobility of the primary brake system caused the participant to impact zip line components resulting in rider injuries. The arrival guide instructing the departure guide to launch zip line riders prior to ensuring the brake is set in position and actively functional is likely a contributing factor. |

Photos or diagrams

**Departure Platform View Down Zip Line**

## Arrival Platform View up Zip Line

## Brake System at Arrival Platform

## Brake Block that catches Riders Trolley