

## Incident Summary #II-1555468-2023 (#35591) (FINAL)

SUPPORTING INFORMATION	Incident Date	May 20, 2023		
	Location	Kootenays		
	Regulated industry sector	Amusement Devices - Zip line		
	Impact	Injury	Qty injuries	1
			Injury description	2 Broken/ Fractured Ribs and back discomfort.
			Injury rating	Moderate
	Damage	Damage	Damage description	N/A
			Damage rating	None
Incident rating	Moderate			
Incident overview	The zipline braking system failed to properly decelerate a guest participating in a zipline tour who was unable to be properly stopped due to environmental conditions causing increased speed and reduced brake friction when coming into the braking and landing area.			
INVESTIGATION CONCLUSIONS	Site, system and components	<p>The zipline is a pulley suspended on a cable, usually made of stainless steel, mounted on a slope. It is designed to enable cargo, or a person propelled by gravity to travel from the top to the bottom of the inclined cable onto a landing platform, attached to the freely moving pulley. It is used for adventure sport, recreation, or tourism.</p> <p>The braking system on zipline #4 consists of a brake block and pulleys system that is tensioned with a turn buckle that applies the required tension to the braking system for days weather conditions. The brake block is set upwards of 150 feet out onto the brake system and zip line depending on conditions and rider weight. The braking guide is responsible for applying enough friction on the rope and pulley system to stop the guest prior to contacting the backup pad.</p> <p>The employee training manual and radio procedures outline 5 different codes for the rider's weight classifications that are used to communicate from the departure guide to the arrival guide for proper setting and adjustment of the brake block distance. The arrival guide must set the brake block then apply friction to the brake rope to slow the rider and reduce the friction to allow the rider to enter the landing platform safely and comfortably. As the rider is zipping, the arrival guide is to maintain visual contact of the guest and further adjust the brake block as necessary.</p>		
	Failure scenario(s)	<p>On the day prior to the incident, the zip line experienced rain and wind. The arrival guide called the course manager to help assess the scenario due to the environmental conditions. The course manager assessed the scene and decided normal operations to continue since the rain and wind had returned to safe zip lining levels. The course manager assessed this by monitoring the windsock and confirmed that the wind was not above company safe zip lining procedures. After watching seven guests zip line into the brake system, the course manager decided all operations were continuing as normal and returned to the office. As a rider was preparing to travel across zipline #4, the zip line brake system was set at its max distance and all braking operations were normal. During a fast-moving weather pattern, a guest came into the braking area at a high rate of speed. The guests speed increased as a strong wind gust came from behind them.</p> <p>The braking guide failed to anticipate the speed of the guest and when they applied braking friction, they failed to achieve enough friction to stop the guest before they impacted the backup braking pad.</p>		

<p>Facts and evidence</p>	<ul style="list-style-type: none"> <li>• There was inclement weather moving through the area and wind and rain was prevalent at the time of the incident.</li> <li>• Windssock protocol was being followed but there was a large wind gust at the time the guest was entering the braking area.</li> <li>• The guide was a new employee They had passed all required training and obtained their credentials.</li> <li>• The guides were trained to and were following wind monitoring protocols.</li> <li>• Wind monitoring method used is a windssock mounted in an adjacent location from the landing platform.</li> <li>• When the guest entered the zip line the arrival guide was not prepared for the increased velocity that the wind gust produced on the guest's speed.</li> <li>• When the guest entered the zip line system the guide tried to stop the guest however failed to achieve enough friction to stop the guest before the backup braking pad.</li> <li>• The guide involved in the incident admitted to not being committed to stopping the guest in time due to the excess speed the guest came into the system.</li> <li>• The Guest was 100 pounds under the maximum weight limit.</li> </ul>
<p>Causes and contributing factors</p>	<ul style="list-style-type: none"> <li>• It is very likely that the decision to continue zip line operations combined with the inappropriate use of the braking system for environmental conditions was the cause of the incident and injuries.</li> </ul>