Incident Summary #II-705299-2018 (#7610) (FINAL)

SUPPORTING INFORMATION	Incident Date		June 14, 2018
	Location		North Vancouver
	Regulated industry sector		Amusement Devices - Zip line
	Impact – Injury	Qty injuries	2
		Injury description	Neck strain (headache, stiff neck) to 2 of riders
		Injury rating	Minor
	Impact – Damage	Damage description	NA
		Damage rating	None
	Incident rating		Minor
	Incident overview		2 riders sustained a neck strain type injury when the trollies they were riding engaged the braking system.
INVESTIGATION CONCLUSIONS	Site, system and components		• *Groups of riders progress through a series of multiple zipline units. Guides lead and provide instruction to the groups of riders*. • *Incident occurred on a unit with 2 parallel zipline ropes approximately 180 m long.* • *Previous inspection records indicate an average rider speed of 10.9 m/s.* • *Brakes at the landing station consist of a system in which the trolley is decelerated by engaging and compressing a set of helical springs. A configuration utilizing ropes, rope clutches, pulleys and a trolley capturing mechanism provides control of the rebound after the trolley engages the springs.* • *The riders are instructed by the zipline guides to assume a "braking position" (knees up, both hands on the trolley handle) as they approach the landing area. Signage at the launch station illustrates this, "Braking Position".*
	Failure scenario(s)		The deceleration rate was of a magnitude that it caused injury to riders.
	Facts and evidence		A rider that had participated in the zipline tour, reported to Technical Safety BC that when they and their spouse (both riding the ziplines) came into the landing station and hit the braking system that: • The deceleration was described as "the shock was extremely abrupt". • The rider indicated that they were in the correct "Braking Position" when they approached the landing. • Both riders sustained neck stain type injuries (neck pain, headache).

Incident Summary #II-705299-2018 (#7610) (FINAL)

	Historically, operator policy required that riders on this zipline unit assume a “starfish” position (arms and legs apart) as they traveled down the line. This was to maximize wind drag and minimize speed. The operator had recently changed their written policy to no longer indicating it as a requirement. The rationality to changing this policy is likely due to the fact the bottom station had been recently raised in an effort to reduce rider speed. It was observed and confirmed that guides were no longer requiring riders to assume the starfish position. After the operator became aware of the incident occurring, this policy was reversed and the mandatory starfish position was re-implemented.
Causes and contributing factors	Because the riders were not utilizing the starfish position it is possible that the speed of the rider was excessive and braking forces experienced by the riders were excessive. A policy change which no longer required that participant use the “starfish’ position is a possible contributing factor to excess speed.

Braking System