Incident Summary (Reference #5618622) FINAL

SUPPORTING INFORMATION	Incident Date		*July 21, 2017*
	Location		*Vancouver*
	Regulated industry sector		*Amusement Devices, Amusement Ride*
	Impact – Injury	Qty injuries	*1*
		Injury description	*Bump to occipital region of head, headache and dizziness*
		Injury rating	*Minor*
	Impact – Damage	Damage description	*None*
		Damage rating	*None*
	Incident rating		*Minor*
	Incident overview		*During a ride cycle a patron standing in the ride queue line was struck in the head by the foot of a rider on a rotating swing type ride (wave swinger).*
INVESTIGATION CONCLUSIONS	Site, system and components		A swing type ride in operation since 1976. (Wave Swinger) The unit is a configuration of single seat carriers that are suspended by chains from an overhead rotating carousel. The rotating carousel rises up and also tilts during the ride cycle. Rotation and lift of the carousel is provided through the use of multiple hydraulic drive and hydraulic control systems. The queue line partially circles around the ride perimeter fencing. A manual brake pedal is located in the ride operating area. The brake is intended to be operated by the attendant to provide additional deceleration force to the rotation of the carousel at the end of the ride cycle.
	Failure scenario(s)		*During the ride cycle the trajectory of the suspended carriers were allowed outside of the ride's safety envelope.*
	Facts and evidence		• *The unit was operating for an adults only event, therefore it is likely that the ride was more heavily loaded than typical.* • *A manufacturer's representative that was engaged by the operator to assess and correct the operation of the unit determined that:* *The manual brake pedal was ineffective in slowing the rotating carousel and was being slowed by the normal frictional drag of the rotation.*

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	The reason the brake was not effective was due to an error in the orientation of the porting of the brake system (hydraulic line was connected to the incorrect port of the brake control).
Causes and contributing factors	*Likely, due to the brake being ineffective and because of the additional mass on the ride, the carousel rotation decelerated at a slower than normal rate. Because of this, as the carrousel lowered, the trajectory of the suspended rotating carriers were forced outside of the normal ride safety envelope (carriers were lower and swinging further outside than the norm.) resulting in an interference condition between riders and the patrons in the queue line.*

Photos or diagrams (if necessary)