Incident Summary Report II-692976-2018 (ID: 7308)

SUPPORTING INFORMATION	Incident Date		May 20, 2018
	Location		Coquitlam, BC
	Regulated industry sector		Elevating Devices - Elevator
	Impact – Injury	Qty injuries	None
		Injury description	None
		Injury rating	None
	Impact – Damage	Damage description	Loss of operation. Overspeed governor electrical switch tripped. No tension on the lifting arm connected to the car safeties.
		Damage rating	Insignificant
	Incident rating		Insignificant
	Incident overview		The elevator overspeed governor electrical switch tripped during travel and caused an emergency stop of the elevator resulting in an entrapment of 1 person in the car. The lifting arm attached to the elevator safeties engaged the safeties during the emergency stop. Service personnel manually controlled car and removed person in the elevator.
INVESTIGATION CONCLUSIONS	Site, system and components		The overspeed governor electrical switch is designed to trip when the speed of the car exceeds the normal rated speed of the elevator. If the elevator car exceeds its rated speed (overspeed), the electrical switch will trip and open the safety circuit and stop the movement of the car by applying an emergency brake on the main drive (motor). The car safeties are triggered mechanically by the overspeed governor at a speed that is higher than the speed at which the overspeed governor electrical switch will trip. When the overspeed governor is tripped mechanically, jaws will grab the governor rope and pull the lifting arm connected to the car safeties. The car safeties will engage and stop the motion of the car. When the safeties engage, the safety plank switch will open and remove power to the drive(motor).
	Failure scenario(s)		*Failure Scenario 1* The overspeed governor electrical switch was adjusted to trip at a speed only 16fpm faster than the rated speed of the elevator. A larger margin between the actual speed (354 fpm) and the electrical tripping switch speed (370 fpm) would be needed to prevent accidental contact with the governor flywheel and the electrical switch if the speed of the car fluctuates. There was insufficient tension on the governor rope and the lifting arm that is connected to the car safeties, allowing excessive movement (bounce) of the lifting arm. When the overspeed governor electrical switch tripped, the safety circuit was opened and the emergency brake on the main drive (motor) applied and stopped the car abruptly. The hard stop would cause the elevator car to bounce and the excessive play in the lifting arm allowed the car safeties to apply and open the safety plank switch. *Failure Scenario 2* The car door operator clutch may have contacted the roller assembly of a landing door while travelling, causing an abrupt stop when the safety circuit opens and causing the lifting arm connected to the car safeties to bounce.

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Facts and evidence	On-site Investigation observations: • Service personnel confirmed the overspeed governor electrical switch was tripped. • Service personnel confirmed that the car safeties were engaged and safety plank switch was tripped, but the overspeed governor was not mechanically tripped and did not contribute to the safeties being engaged. The mechanical tripping speed of the overspeed governor was confirmed to be 450 fpm. • Performed test to confirm actual tripping speed of the overspeed governor electrical switch. 370 fpm (16 fpm above normal run speed – 354 fpm). • Observed insufficient tension in the governor rope and lifting arm connected to the car safeties allowing excessive movement (bounce) enabling car safeties to engage and trip the safety plank switch. • Phase I fire service was initiated by the Firemen responding in an attempt to recall the car to the designated landing. Fire service was not related to the incident. • Service personnel noted that a landing door counterweight for the door close tensioner was detached from its cable connected to the landing door – Landing door had no close tension.
Causes and contributing factors	It is possible that a door lock roller misalignment with the car door power operator clutch may have caused the door lock circuit to open while the car is in motion, resulting in a sudden de-acceleration of the elevator car. The sudden de-acceleration would cause the car to bounce and trip the electric switch on the overspeed governor. The excessive movement of the lifting arm connected to the car safeties would allow the car safeties to engage.