Incident Summary #II-952859-2019 (#16111) (FINAL)

SUPPORTING INFORMATION	Incident Date		December 9, 2019
	Location		Vancouver, BC
	Regulated industry sector		Elevating devices - Elevator
	Impact – Injury	Qty injuries	1
		Injury description	The male user sustained minor abrasions
		Injury rating	Minor
	Impact – Damage	Damage description	The elevator car, hoistway door and some control systems sustained damage due to impact from a motorized scooter and from rescue efforts.
		Damage rating	Major
	Incident rating		Major
	Incident overview		The elevator hoistway door safety retainer failed during forceful impact by a male riding an electric scooter.
INVESTIGATION CONCLUSIONS	Site, system and components		The equipment involved was a Schindler 3300 Hydraulic elevator. The elevator hall doors are responsible for enclosing the elevator shaft and to open and close to allow users to enter and exit the elevator car. The elevator hall door hangs on a metal track by using rollers to allow the door to slide freely back and forth. The bottom of the doors have retainer brackets known as “gibs” and a safety retainer which slide in a slotted door track below known as the sill. The gibs (2 is this installation) are metal plates that guide the lower portion of the door and maintain alignment as the door opens and closes. The gibs also restrain the door from being pushed inward and help the door from becoming dislodged. The hall door safety retainer is an auxiliary gib that is designed and installed to prevent the hall door from being dislodged if the main gibs failed. The primary gibs and auxiliary gibs are attached to the door with screw fasteners. The scooter involved in the incident was a four wheeled ride on electric powered vehicle with a storage basket.
	Failure scenario(s)		A male driving an electric scooter drove his scooter into the elevator hall door and impacting the elevator door at approximately 11” above the floor. The elevator door was pushed open upon impact such that the scooter and driver fell into the elevator shaft and down onto the roof of the elevator car which was parked at a lower floor.
	Facts and evidence		Examination following the incident found damage to the hoistway door at the top landing (street level), top of elevator car inspection control panel, handrail and door operator controls. Firefighters rescue efforts to extract the driver caused damage to the emergency exit and door restrictor. After removal of the hall door gibs (bottom door guides), it was determined that the door gibs were installed low enough into the landing sill track to be code compliant. After examining the upper door track, it was determined that the door eccentrics were

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	adjusted properly to prevent the upper door track from dislodging when a force is applied to it along with the top door retainers. The door hanger assembly was in place but had some minor damage to the assembly. After the hall door was removed from the door track, there was some signs of damage to the lower door section where the door gibs and door safety retainer are attached to the door. The lower door section was bent where these components were mounted to. There was signs of corrosion in the lower door section and on the mounting hardware. This was likely due to the outdoor environment that the unit is installed in. The glass in the hall door was damaged where the scooter impacted the door. The glass had cracks but did not completely fail. Video of the event, scooter specifications, elevator design specifications and metallurgical examination of the damaged gibs provided evidence and data for a detailed engineering failure analysis. Engineering calculations and analysis confirmed that the momentum of the male driver and electric scooter travelling at a relatively high rate of speed and impacting the elevator door at approximately 11” above the floor was high enough to push the door inwards. The impact was great enough that it imparted a force that was greater than what the hall door safety retainers were designed to withstand. The screws used to fasten the gibs were found to have a significant level of corrosion due to exposure to corrosive elements. These elements could include moisture from rain, snow or floor washing fluids and salts from de-icing chemicals. The level of corrosion was not great enough to effective decrease the retaining strength of the screws, however, does identify a maintenance consideration for longer term exposure. The elevator hoistway door safety retainer failed due to forceful impact by a male riding an electric scooter.
Causes and contributing factors	There is high probability that based on analysis of the facts and evidence the force that was imparted to the door system by the male driver and the scooter caused the hoistway door safety retainer system to fail. The force imparted was greater than what the hoistway door safety retainer system was designed to withstand.

Photos or diagrams

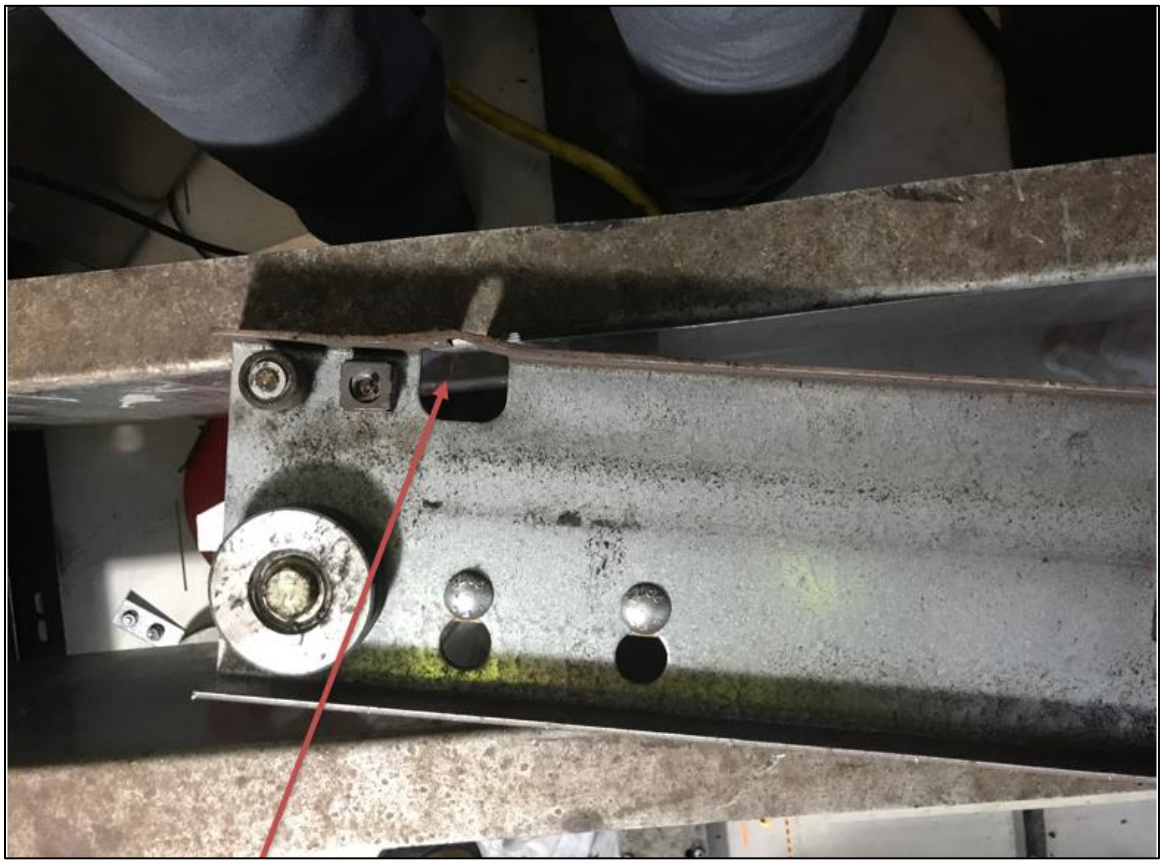

Photo 1: Door Hanger Damage

Photo 2: Corrosion of Lower Door Section

Photo 3: Door Gib - Devices on bottom of sliding door panels which fit into sill grooves and hold the door panels in alignment.

Photo 4: Door gib mounting screws – exposed threads show corrosion

Photo 5: View of bottom of elevator door – corrosion present on bottom and some damage from impact