

Common Findings from Lift and Escalator Inspections and Incidents (Oct 20 – Sep 21)

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1. INDUSTRY PERFORMANCE



2. COMMON FINDINGS FROM LIFT INSPECTIONS



3. LIFT INCIDENTS



4. ESCALATOR INCIDENTS



Industry Performance

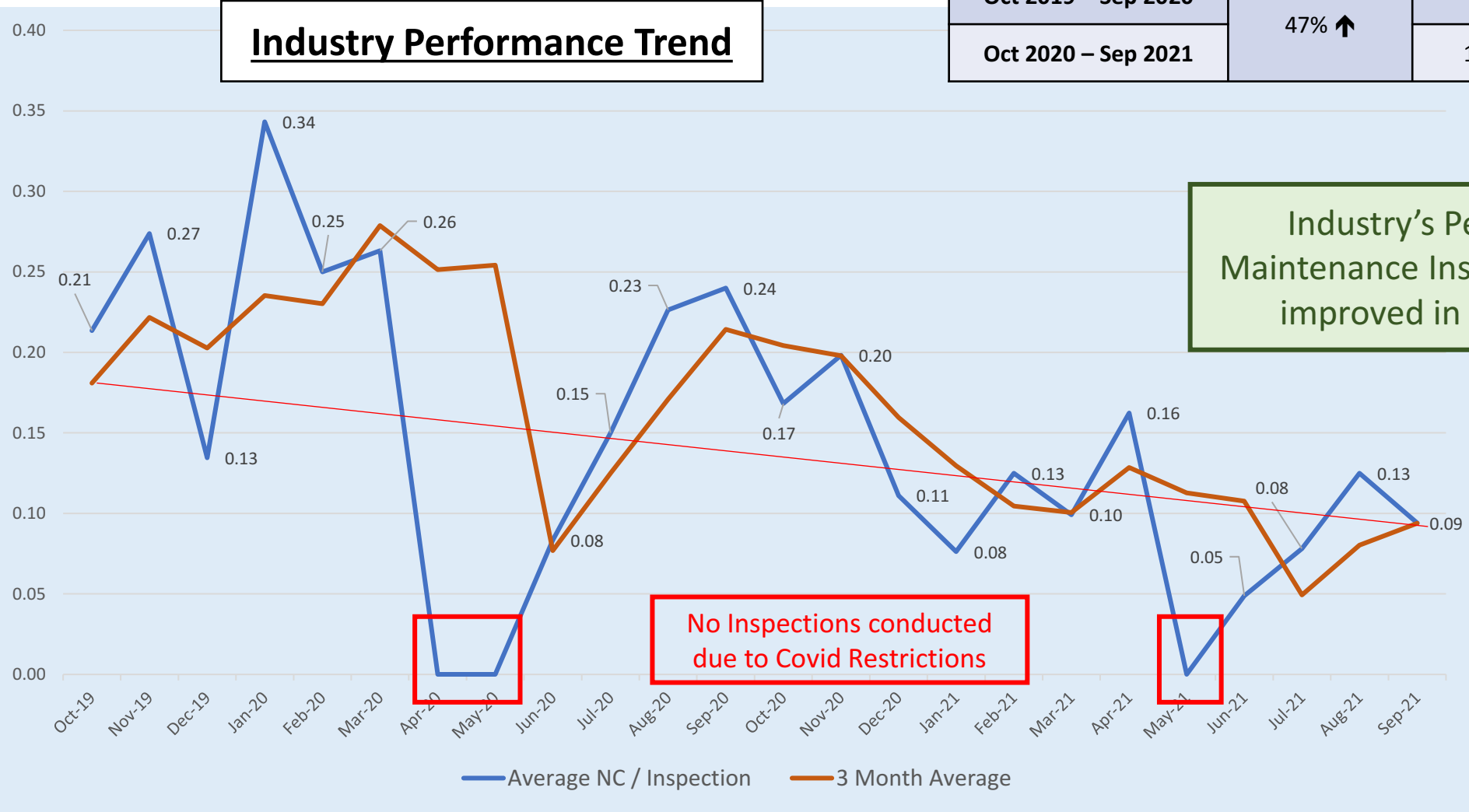
Past 24 months (Oct 19 – Sep 21)



Do not circulate to external parties without BCA's prior consent

INDUSTRY PERFORMANCE

Period	Audits	Non Compliances (NC)	Non-compliance (NC)/ Audit
Oct 2019 – Sep 2020	47% ↑	165	0.23
Oct 2020 – Sep 2021		127 (23%) ↓	0.12 (48%) ↓



Industry's Performance during Maintenance Inspections had generally improved in the last 12 months

No Inspections conducted due to Covid Restrictions



Common Findings from Lift Maintenance Outcome Inspections

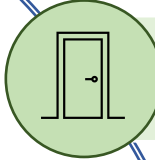



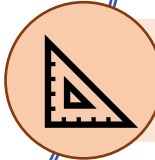
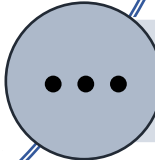
Past 12 months (Oct 20 – Sep 21)



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COMMON FINDINGS

No. of Non-Compliances Observed

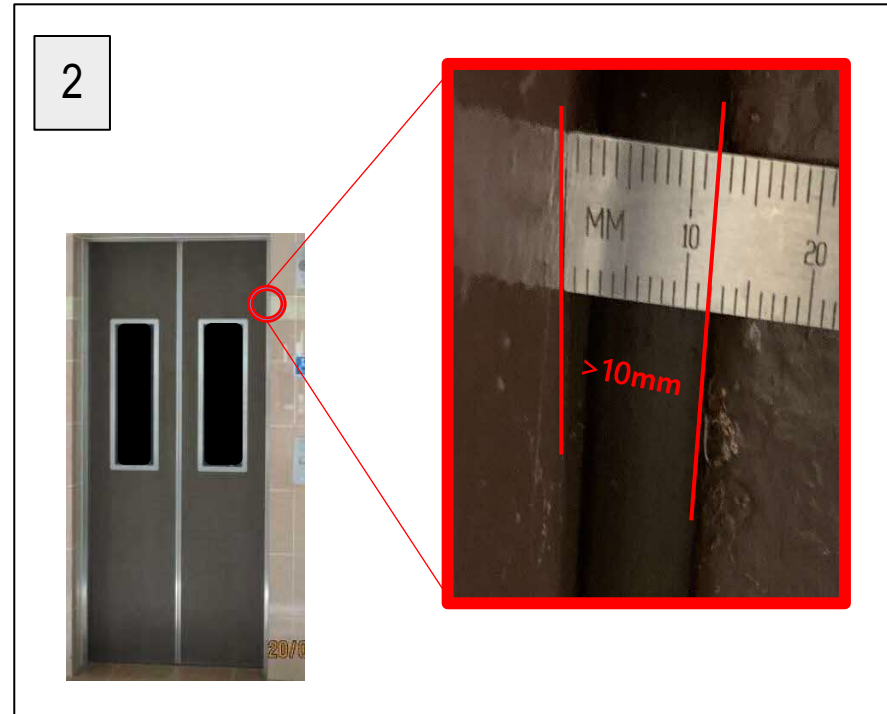
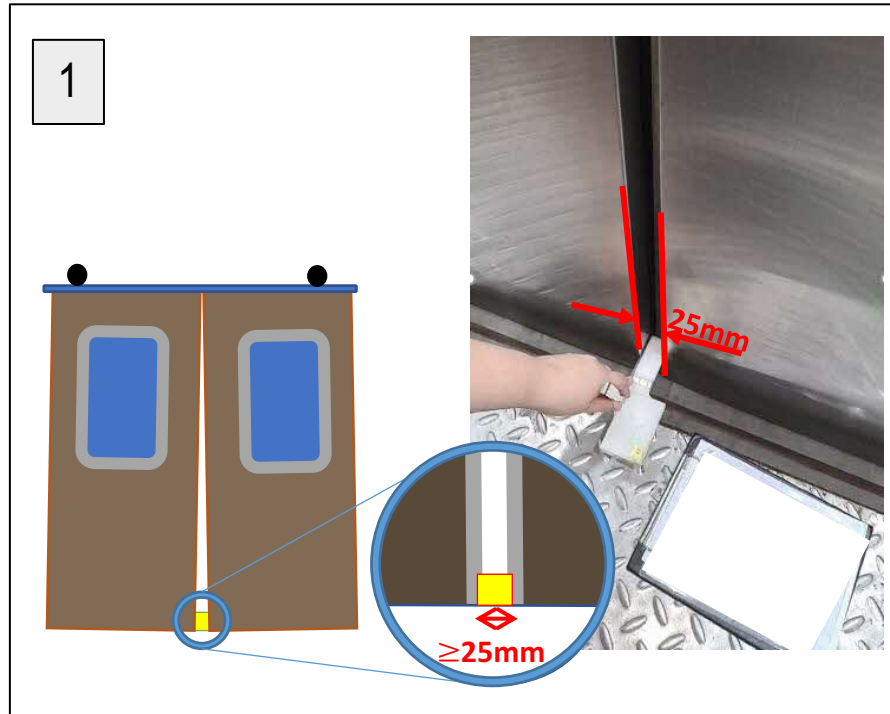
	Oct 20 – Sep 21
 1. LIFT DOORS	31 (25%)
 2. EMERGENCY POWER SUPPLY	28 (22%)
 3. ALARM / INTERCOM	20 (16%)
 4. OVERSPEED GOVERNOR	13 (10%)
 5. STOPPING ACCURACY	12 (9%)
 6. OTHERS	25 (20%)

↑
Top 5 Findings (80%)
↓

TOP 5 COMMON FINDINGS (1)



1. LIFT DOORS (25%)

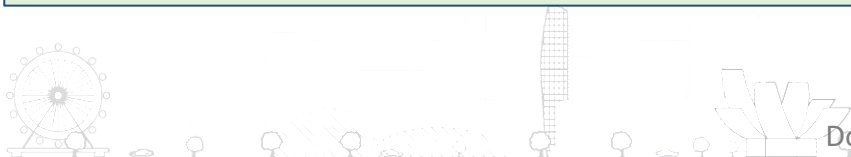


FINDINGS

- (1) Lift moved when there is a 25mm (or more) gap at lift car doorway.
- (2) Clearance between lift car door panels and uprights, lintels or sills is in excess of 10mm.

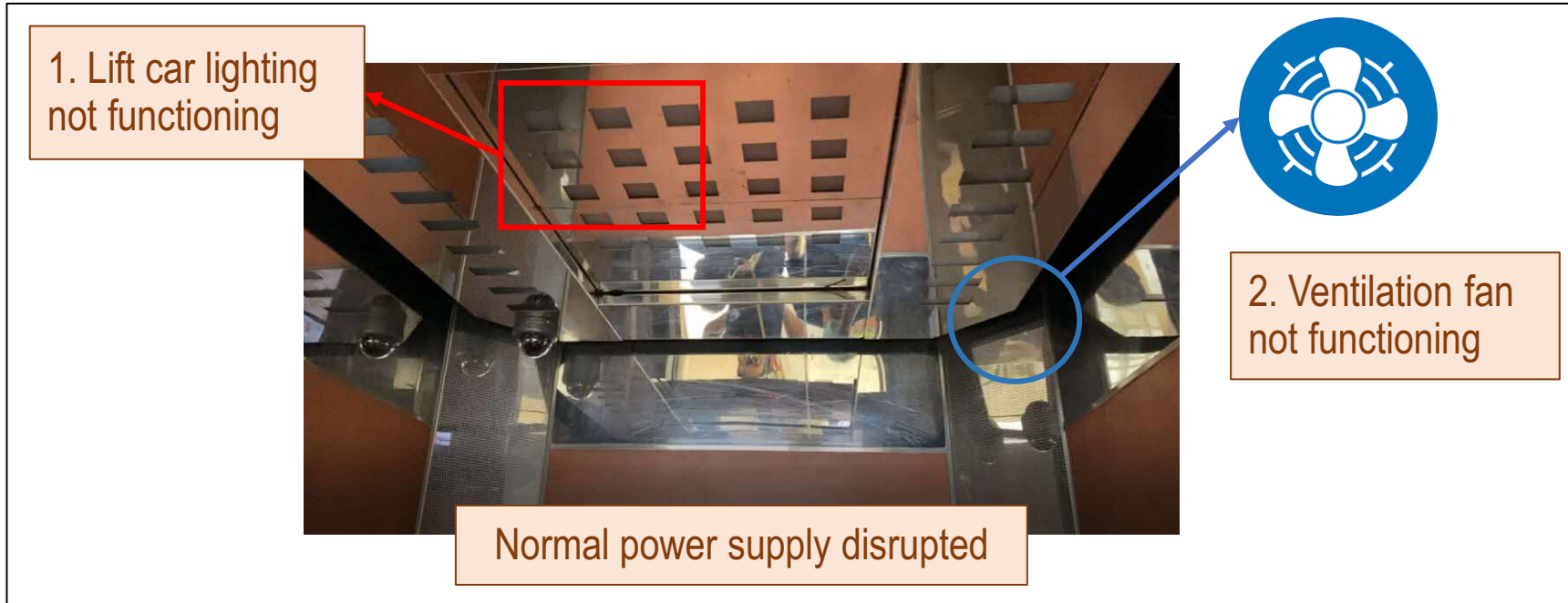
Recommendation

1. During monthly maintenance, to conduct door gap test and make proper adjustments if necessary.



TOP 5 COMMON FINDINGS (2)

2. EMERGENCY POWER SUPPLY (22%)

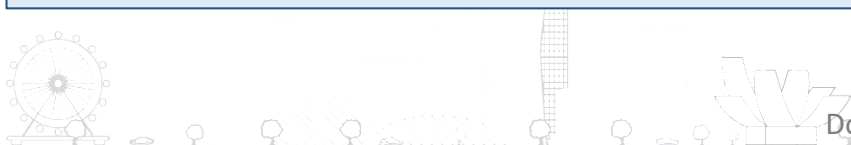


FINDINGS

Lift car lighting or ventilation fan not functioning when normal power supply disrupted.

Recommendation

1. To test during maintenance and ensure that wires are connected properly.
2. To replace the EBOPS battery if battery flat.



TOP 5 COMMON FINDINGS (3)



3. ALARM / INTERCOM (16%)



FINDINGS

Emergency alarm / Intercom not functioning when tested.

Recommendation

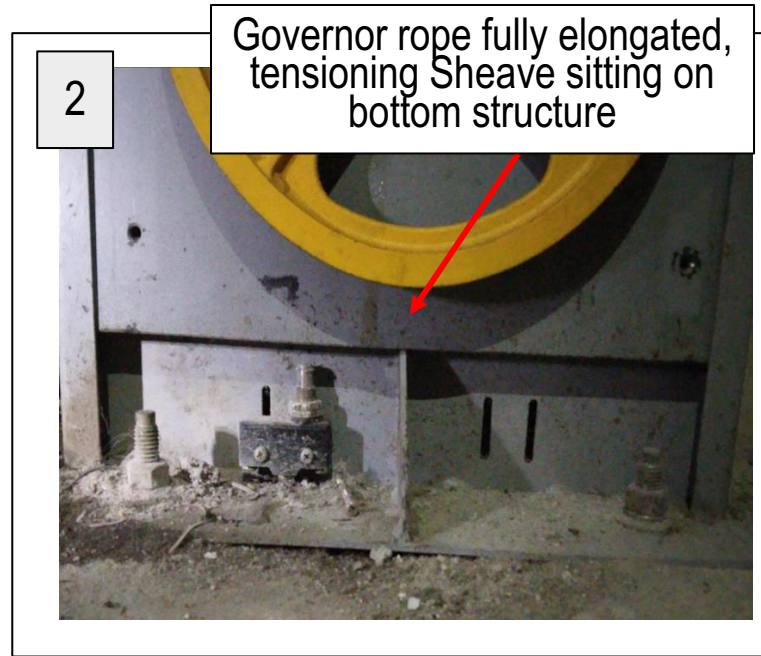
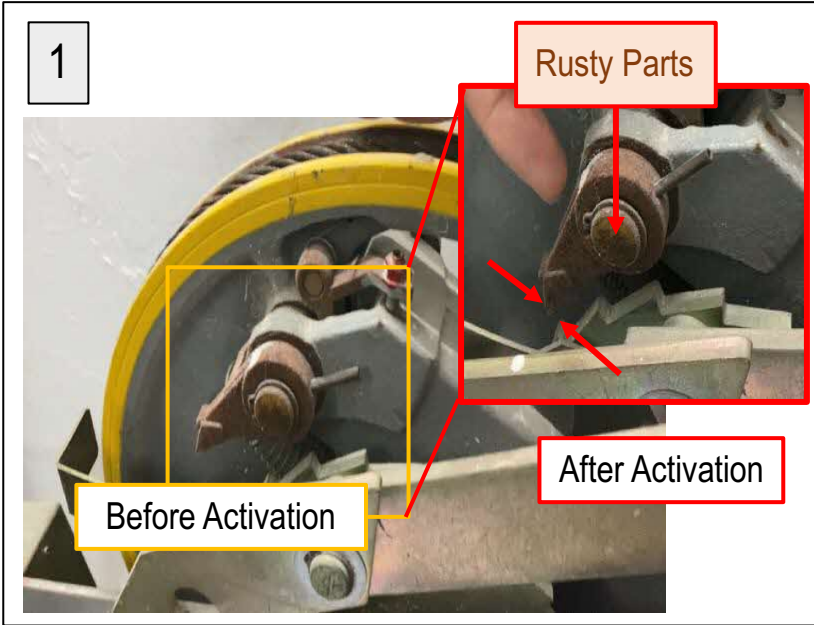
1. To test during maintenance and ensure that wires are connected properly.



TOP 5 COMMON FINDINGS (4)



4. OVERSPEED GOVERNOR (10%)



FINDINGS

- (1) Restricted movement of the parts in the governor (pawl not able to engage the ratchet wheel).
- (2) Tensioning sheave touches pit floor.
- (3) Governor rope slack switch is faulty, damaged, contains missing parts, or misaligned.

Recommendation

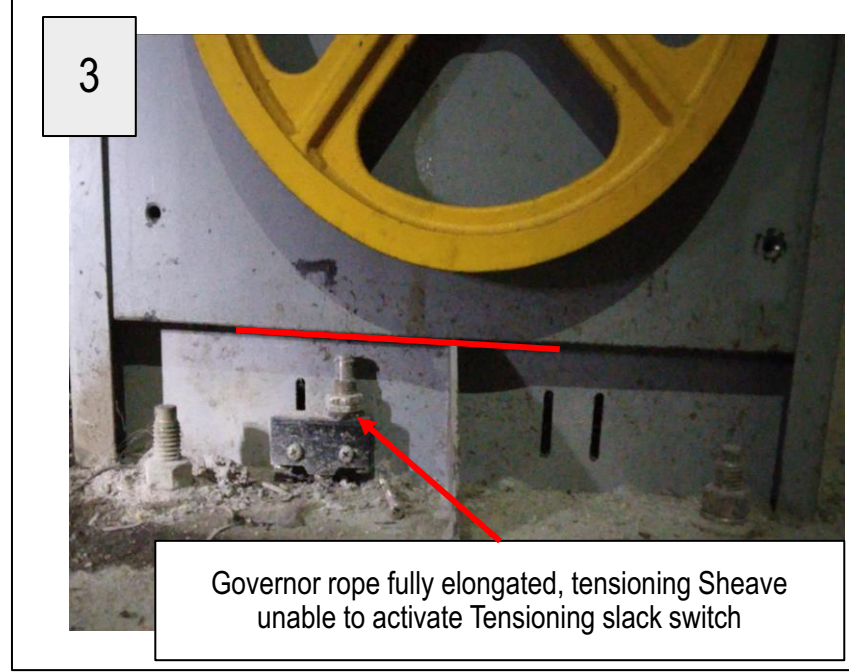
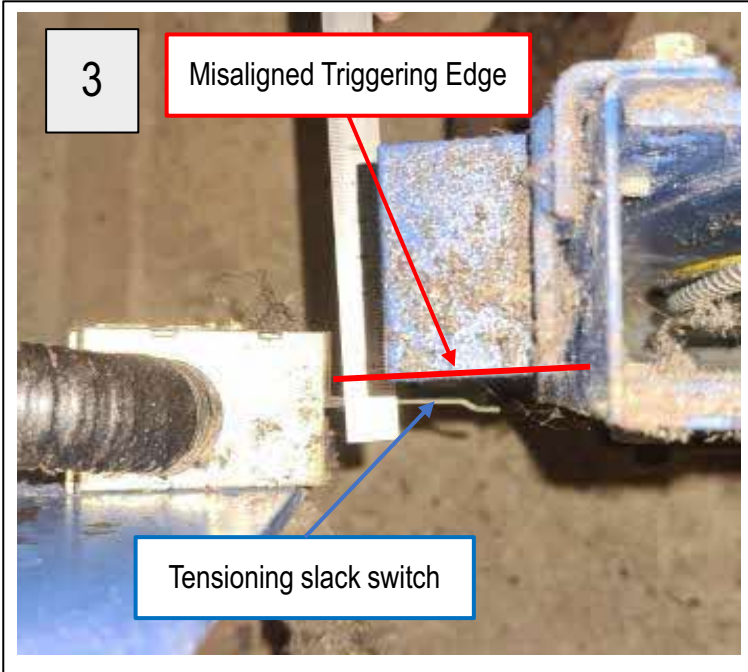
1. To check for restricted movement of the components of the governor, and lubricate / replace if necessary.
2. To recommend for replacement or shortening of governor ropes if excessive elongation observed.



TOP 5 COMMON FINDINGS (4)



4. OVERSPEED GOVERNOR (10%)



FINDINGS

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Recommendation

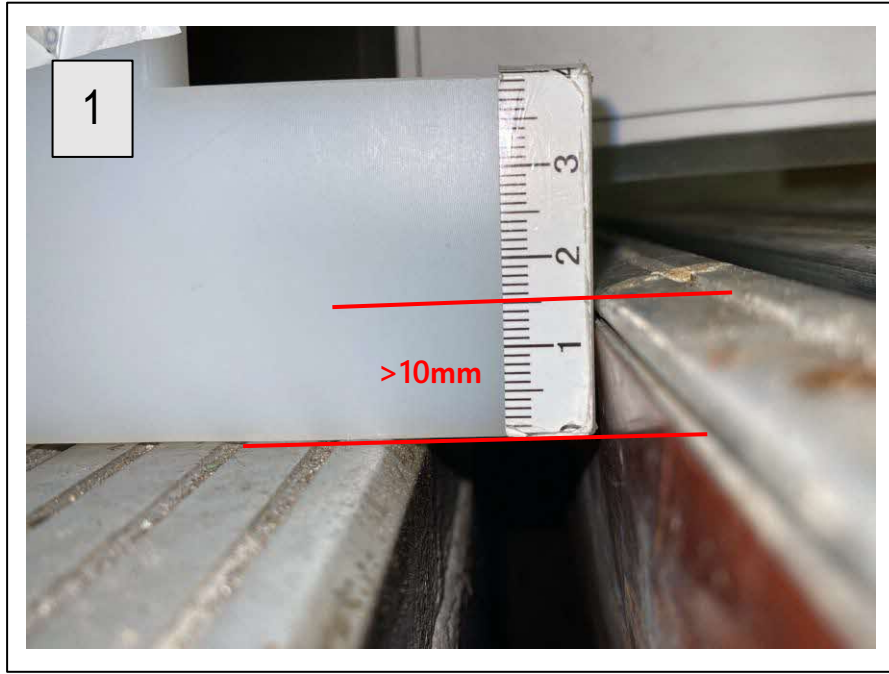
1. Technicians to check for any misalignment of switches and adjust the locations accordingly.



TOP 5 COMMON FINDINGS (5)



5. STOPPING ACCURACY (9%)



FINDINGS

Stopping accuracy in excess of 10mm

Recommendation

1. Technicians to observe if there's any misleveling at each level during maintenance, to perform troubleshooting if observed any.
2. Common causes include : Encoder issue, Limit/Terminal Switch signal loss, Induction switch failure.



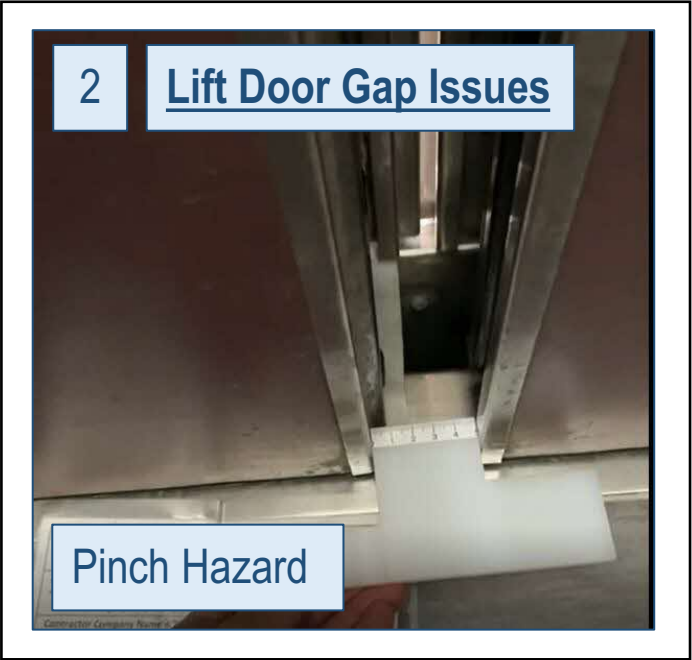
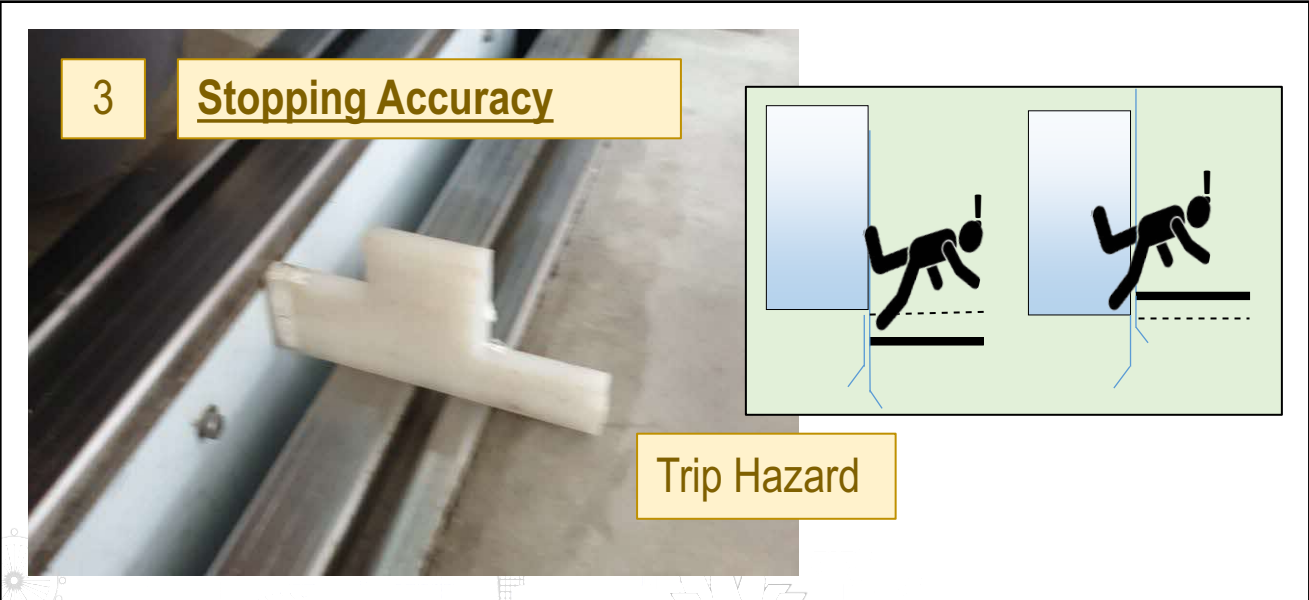
Lift Incidents

Past 24 months (Oct 19 – Sep 21)



LIFT INCIDENTS DUE TO EQUIPMENT FAILURE

	Proportion of Incidents
1. LIFT BRAKE FAILURE	(25%)
2. LIFT DOOR GAP	(19%)
3. STOPPING ACCURACY	(19%)
4. FAILURE OF DOOR PROTECTIVE DEVEICES	(13%)

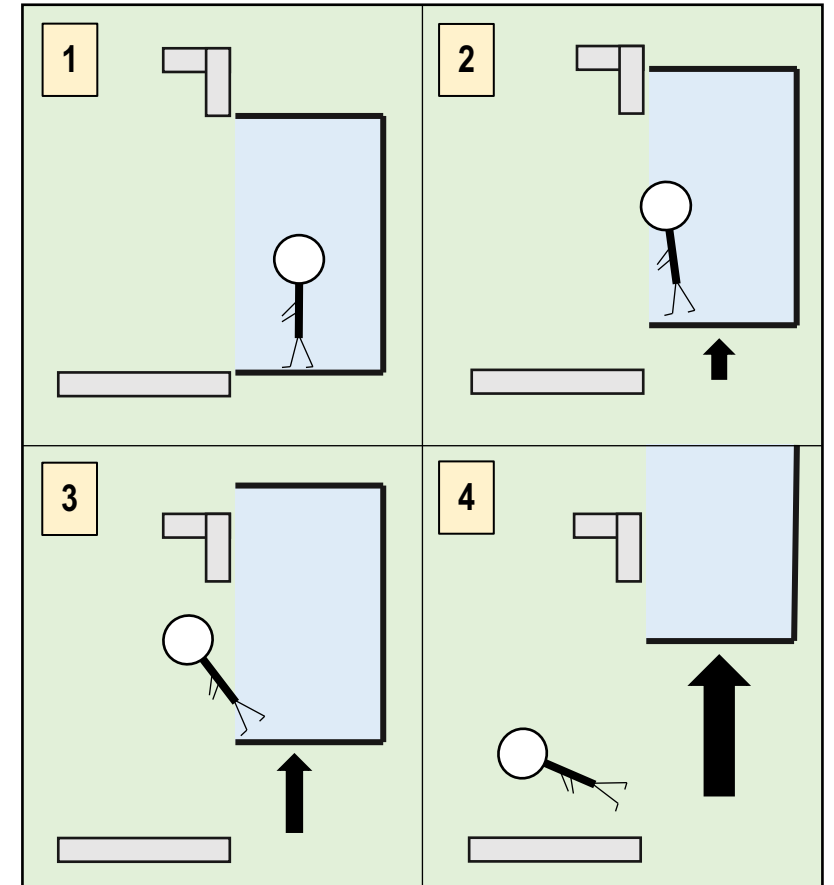


LIFT INCIDENTS CASE STUDY #1

BRAKE FAILURE RESULTING IN LIFT MOVED UPWARD UNCONTROLLABLY

Chronological Sequence of Events

1. A man entered the incident lift at lvl 10 to travel to lvl 1.
2. At lvl 1, lift car started moving up uncontrollably as the man was exiting, he tripped due to the lift movement and suffered minor injuries.
3. The lift car moved up in an overspeed manner, triggered the electrical switch of the overspeed governor.
4. The lift car later stopped at lvl 9.



LIFT INCIDENTS CASE STUDY #1

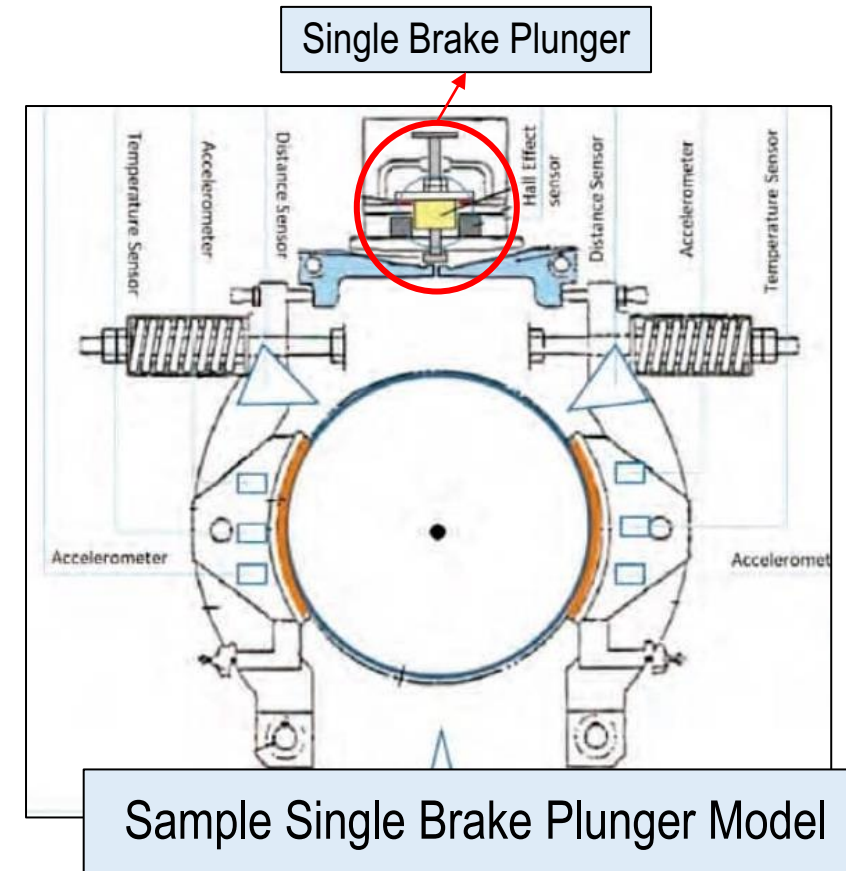
FINDINGS AND RECOMMENDATIONS

FINDINGS & POSSIBLE CAUSE

1. Single plunger brake model (old model), single point of failure.
2. The sliding action of the brake plunger was possibly impeded, probably due to contamination of the sliding mechanism by corrosion, unclean or sticky surfaces, causing compression springs to have pushed the brake shoes installed on the brake arms onto the brake drum being unable to cause the brakes to close adequately.

RECOMMENDATIONS

1. Contractor with single brake plunger lifts to ensure that maintenance and greasing are performed according to schedule.
2. Check plunger movement if smooth during braking
3. To recommend for modernization

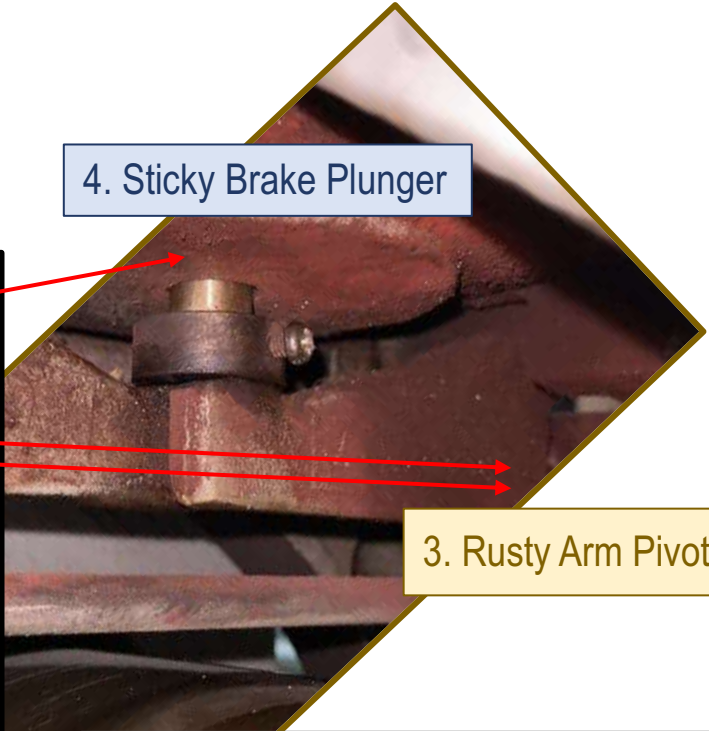
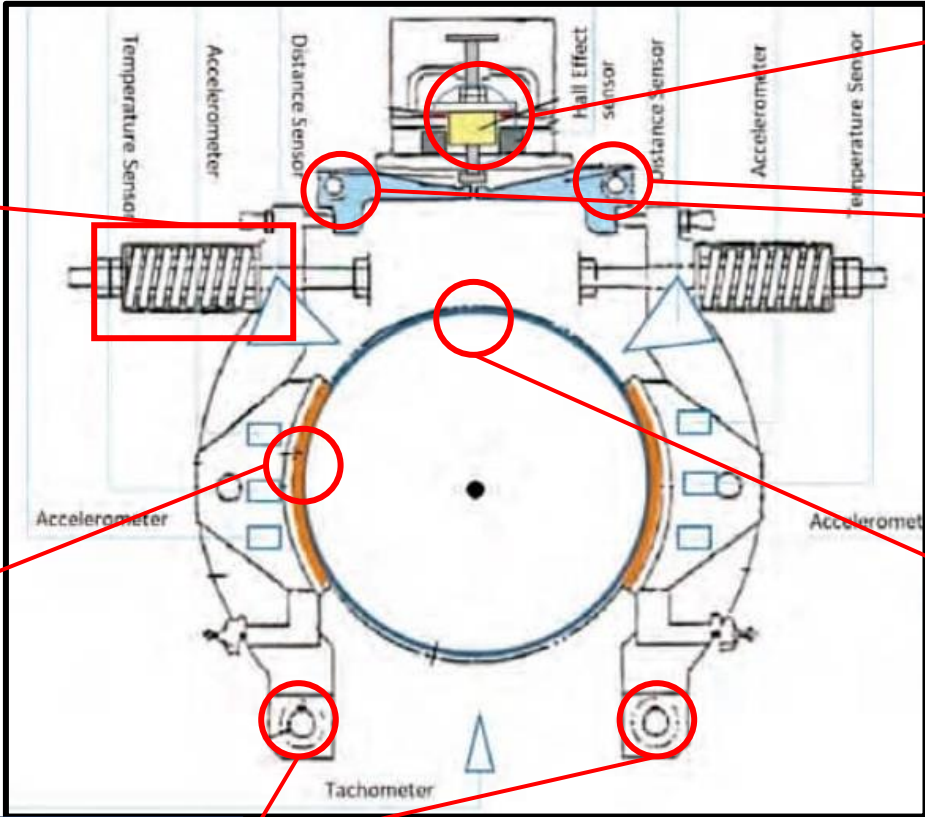


LIFT INCIDENTS CASE STUDY #1

POSSIBLE CAUSES OF BRAKE FAILURE



3. Rusty Arm Pivot



4. Sticky Brake Plunger

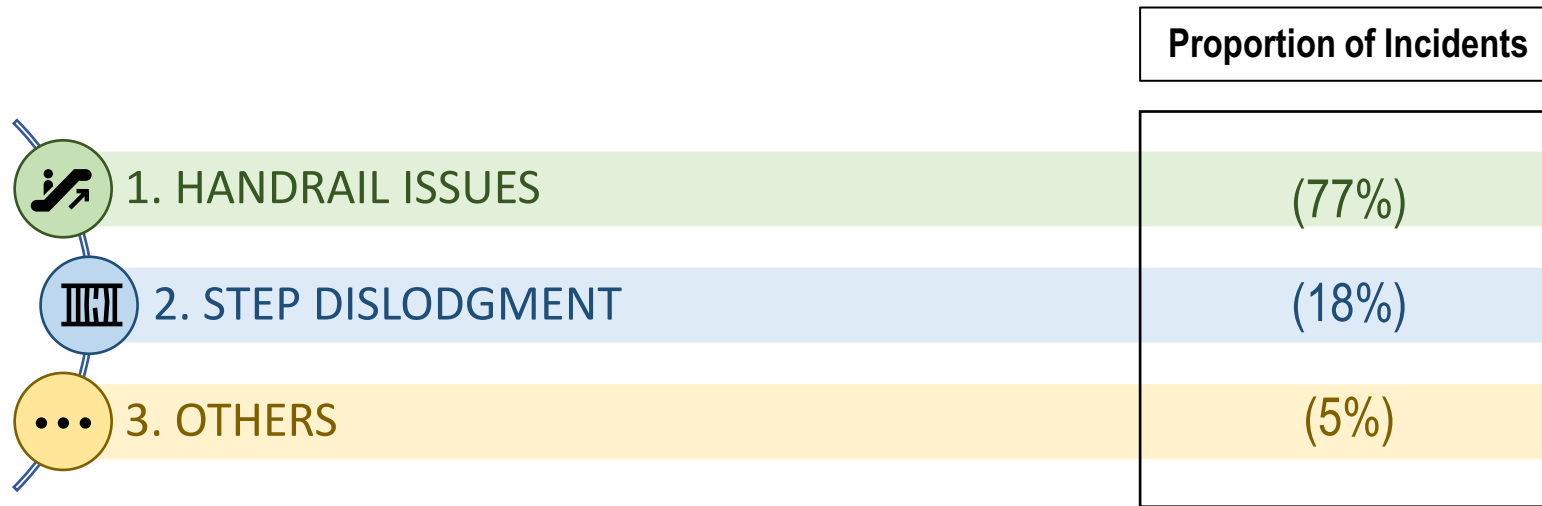


Escalator Incidents

Past 24 months (Oct 19 – Sep 21)



ESCALATOR INCIDENTS DUE TO EQUIPMENT FAILURES



ESCALATOR INCIDENTS CASE STUDY #1

HANDRAIL SLIPPAGE AND HANDRAIL STOPPAGE

Chronological Sequence of Events

1. An elderly lady fell down from an up riding escalator when the left handrail was observed to be intermittently not slipping.
2. 8 Months later, the same escalator was switched to down riding direction, the same handrail stopped moving and caused another elderly lady to fall down as a result.



ESCALATOR INCIDENTS CASE STUDY #1

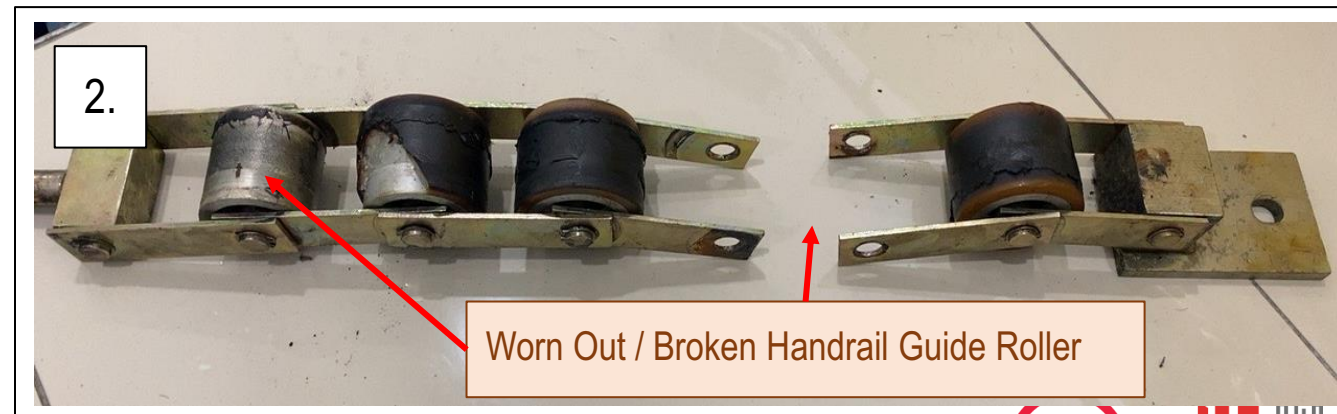
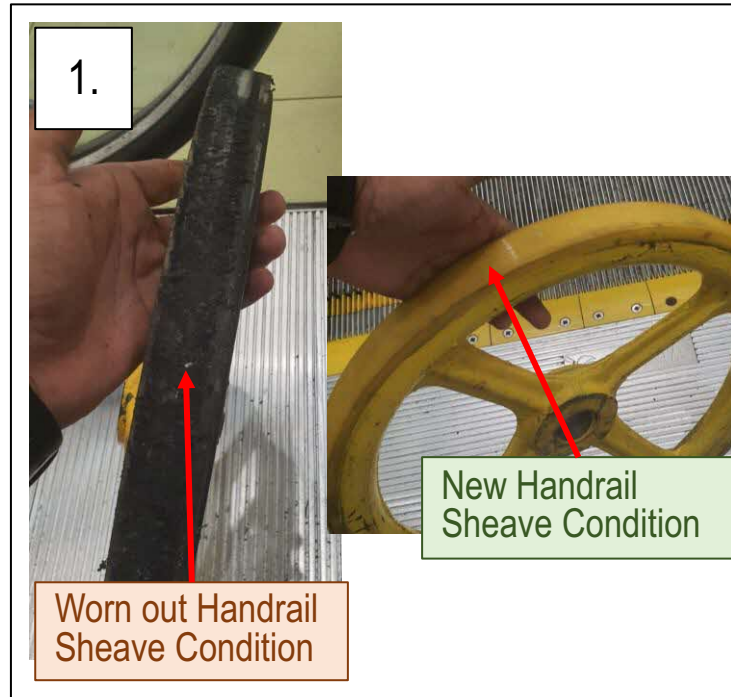
FINDINGS AND RECOMMENDATIONS

FINDINGS & CAUSE

1. Incident 1 : Worn out Handrail Sheave and Handrail Inner Canvas.
2. Incident 2 : Worn out / Broken Handrail Guide Roller.

RECOMMENDATIONS

1. Contractor to check for overall effectiveness of handrail systems. Parts to be checked include Handrail Sheave thickness, Handrail inner canvas conditions.
2. Contractor to recommend replacement if necessary.



ESCALATOR INCIDENTS

ESCALATOR INCIDENTS DUE TO EQUIPMENT FAILURES

1. Handrail Slippage
2. Handrail Stoppage

CAUSES OF HANDRAIL SLIPPAGE

1. Wear & Tear of Handrail / Handrail Drive Sheave.
2. Improper tensioning of Handrail.

RECOMMENDATIONS

1. Contractor to check for overall effectiveness of handrail systems. Parts to be checked include Handrail Sheave thickness, Handrail inner canvas conditions.
2. Contractor to check for tensioning of handrail during maintenance.
3. To recommend replacement if necessary.



ESCALATOR INCIDENTS

ESCALATOR INCIDENTS DUE TO EQUIPMENT FAILURES

1. Handrail Slippage
2. Handrail Stoppage

CAUSES OF HANDRAIL STOPPAGE

1. Broken Components
2. Excessive Wear & Tear

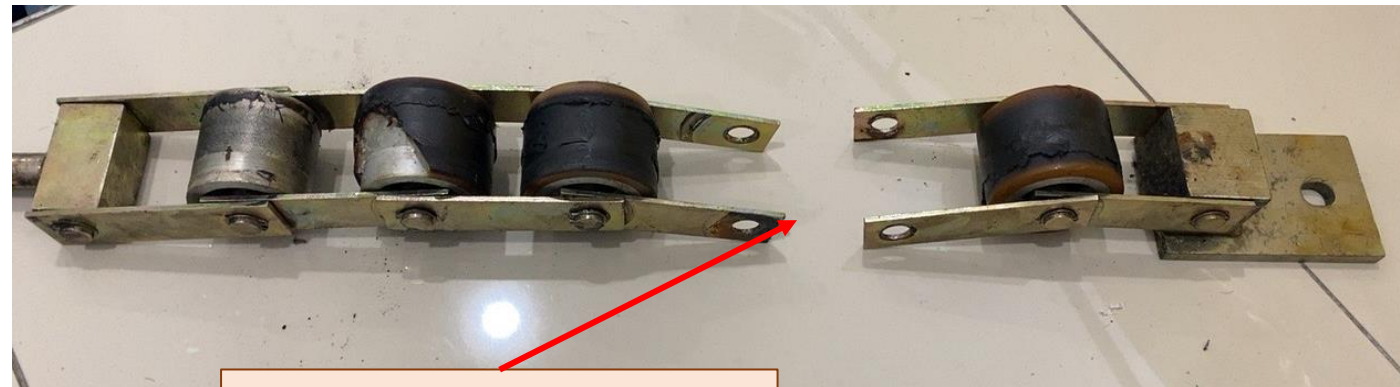
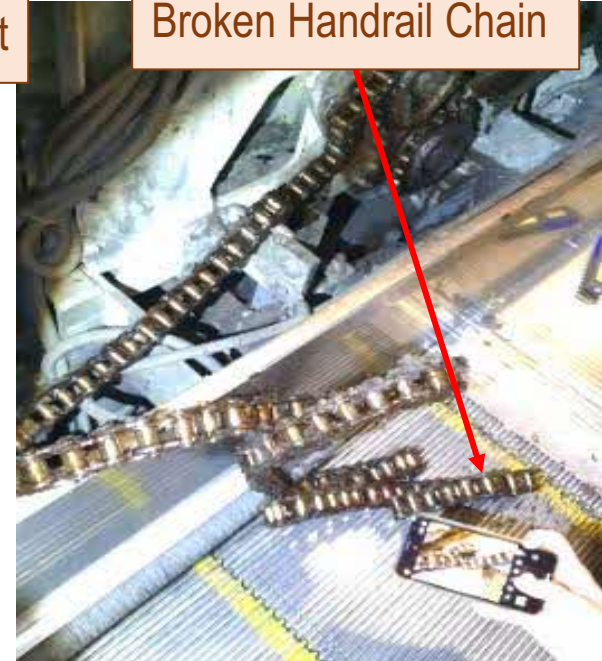
RECOMMENDATIONS

1. To check for elongation, slack, general conditions.
2. Installation of handrail speed monitoring (if possible)

Broken Handrail Drive Belt



Broken Handrail Chain



Broken Handrail Guide Roller

Thank You



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