OVERVIEW OF THE LATEST REGULATORY CONTROL FOR LIFT AND ESCALATOR SAFETY IN HONG KONG

CIBSE One-day Seminar on Latest Development of Lift Engineering
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Presented by:

Ir William T.W. AU
Senior Engineer/General Legislation 3
EMSD, HKSAR Government

CIBSE Hong Kong

機電工程署 EMSD

AGENDA

1. Latest Regulatory Control Over Lift and escalator Safety
2. The New Legislative Framework
3. Industry Expertise and Community Talents for Driving Better Developments
4. Code of Practice, Guidelines and Circulars
5. Guidance to Responsible Persons
6. Risk Based Inspection Model
7. Modernisation of Aged Lifts
8. Step-up Measures to Enhance the Safety of Aged Lifts
9. Modernisation of Aged Escalators
10. Application of new and innovation technologies

LATEST REGULATORY CONTROL OVER LIFT AND ESCALATOR SAFETY

- More than 350 buildings are taller than 150 meters
- 69 200+ lifts and 9 900+ escalators
- Population in excess of 7.5 million
- Annual overall visitor arrival in excess of 65 million

Lifts and Escalator (Safety) Ordinance (Cap.327) ("ex-LESO") enacted

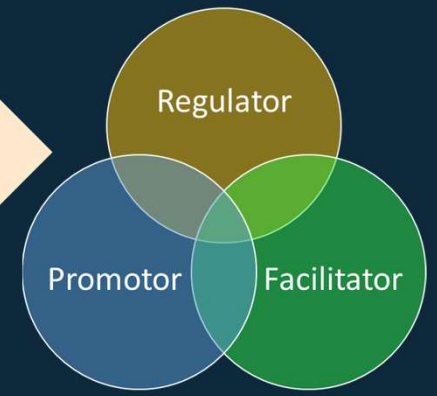
1960

2009

Government of the HKSAR took the initiative to transform the regulatory regime over lift and escalator safety

Lifts and Escalator Ordinance (Cap.618) ("LEO") enacted

2012



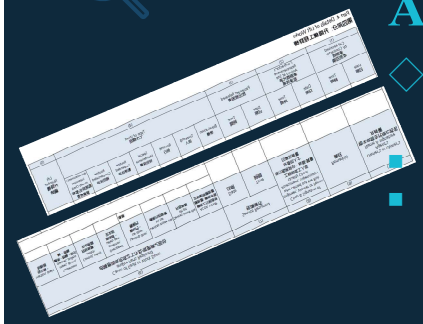
THE NEW LEGISLATIVE FRAMEWORK

- Coverage of the legislation to both public and private sectors
- Registration regime
- Punishment lifted from $10k to $200k while maximum imprisonment term maintained at 12 months
- Concept of responsible persons ("RPs") was brought on board
- Additional roles as Promotor and Facilitator

INDUSTRY EXPERTISE AND COMMUNITY TALENTS FOR DRIVING BETTER DEVELOPMENTS

- The Lift and Escalator Safety Advisory Committee ("the LESAC") was formed in 2013
- Working groups with the engagement of representatives from property agency, trade practitioners and public members

CODE OF PRACTICE, GUIDELINES AND CIRCULARS



- Code of Practice for Lift Works and Escalator Works (2018 Edition)
  - Lift: Special maintenance, revised format of log-book……
  - Escalator: With a vertical rise greater than 15 m, all drive chains are required to be replaced at intervals not exceeding six years of use unless otherwise stated by the chain manufacturer or escalator manufacturer, testing of the brake at intervals not exceeding five years……
- Code of Practice on the Design and Construction of Lifts and Escalators (2019 Edition)
  - EN81-20:2014 - type approval for new and existing models of lifts as well as safety components

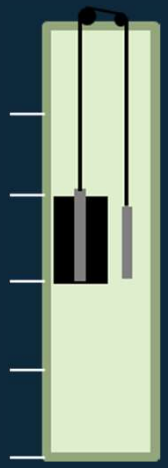
SPECIAL MAINTENANCE

- Applicable to aged lifts without
  - Double braking system
  - Unintended Car Movement Protection device (UCMP) or
  - Ascending Car Over-speed Protection device (ACOP)

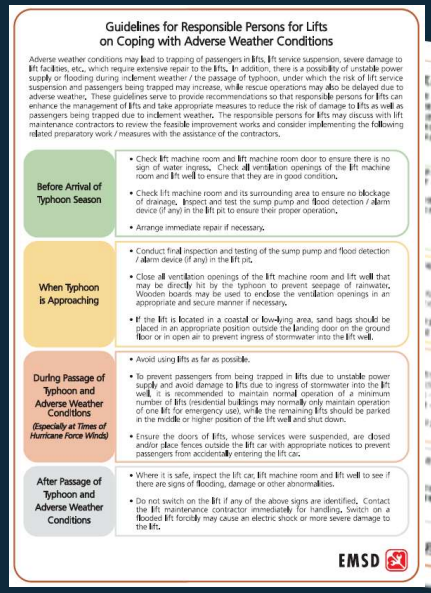
- On top of maintenance schedule / instructions by lift manufacturer
  - Conducting disassembly maintenance of braking mechanism
  - Measurement of braking distance by no-load brake test
  - Measurement of grooves of traction sheave in lift traction machine
  - Check mechanical locks and electrical contacts of all lift landing doors

- To be conducted for not less than twice a year, or manufacturer's instructions

GUIDANCE TO RESPONSIBLE PERSONS



- Guidelines for Responsible Persons for Lifts on Coping with Adverse Weather Conditions
- https://www.emsd.gov.hk/filemanager/en/content_826/Guidelines%20of%20Lift%20Preparedness%20for%20Typhoon%20(Final).pdf



Guidelines for Responsible Persons for Lifts on Coping with Adverse Weather Conditions

Adverse weather conditions may lead to trapping of passengers in lifts, lift service suspension, severe damage to lift facilities, etc., which require extensive repair to the lifts. In addition, there is a possibility of unstable power supply or flooding during inclement weather / the passage of typhoon, under which the risk of lift service suspension and passengers being trapped may increase, while rescue operations may also be delayed due to adverse weather. These guidelines serve to provide recommendations so that responsible persons for lifts can enhance the management of lifts and take appropriate measures to reduce the risk of damage to lifts as well as passengers being trapped due to inclement weather. The responsible persons for lifts may discuss with lift maintenance contractors to review the feasible improvement works and consider implementing the following related preparatory work / measures with the assistance of the contractors.

Before Arrival of Typhoon Season	• Check lift machine room and lift machine room door to ensure there is no sign of water ingress. Check all ventilation openings of the lift machine room and lift well to ensure that they are in good condition. • Check lift machine room and its surrounding area to ensure no blockage of drainage. Inspect and test the sump pump and flood detection / alarm device (if any) in the lift pit to ensure their proper operation. • Arrange immediate repair if necessary.
When Typhoon is Approaching	• Conduct final inspection and testing of the sump pump and flood detection / alarm device (if any) in the lift pit. • Close all ventilation openings of the lift machine room and lift well that may be directly hit by the typhoon to prevent seepage of rainwater. Wooden boards may be used to enclose the ventilation openings in an appropriate and secure manner if necessary. • If the lift is located in a coastal or low-lying area, sand bags should be placed in an appropriate position outside the landing door on the ground floor or in open air to prevent ingress of stormwater into the lift well.
During Passage of Typhoon and Adverse Weather Conditions *(Especially at Times of Hurricane Force Winds)*	• Avoid using lifts as far as possible. • To prevent passengers from being trapped in lifts due to unstable power supply and avoid damage to lifts due to ingress of stormwater into the lift well, it is recommended to maintain normal operation of a minimum number of lifts (residential buildings may normally only maintain operation of one lift for emergency use), while the remaining lifts should be parked in the middle or higher position of the lift well and shut down. • Ensure the doors of lifts, whose services were suspended, are closed and/or place fences outside the lift car with appropriate notices to prevent passengers from accidentally entering the lift car.
After Passage of Typhoon and Adverse Weather Conditions	• Where it is safe, inspect the lift car, lift machine room and lift well to see if there are signs of flooding, damage or other abnormalities. • Do not switch on the lift if any of the above signs are identified. Contact the lift maintenance contractor immediately for handling. Switch on a flooded lift forcibly may cause an electric shock or more severe damage to the lift.

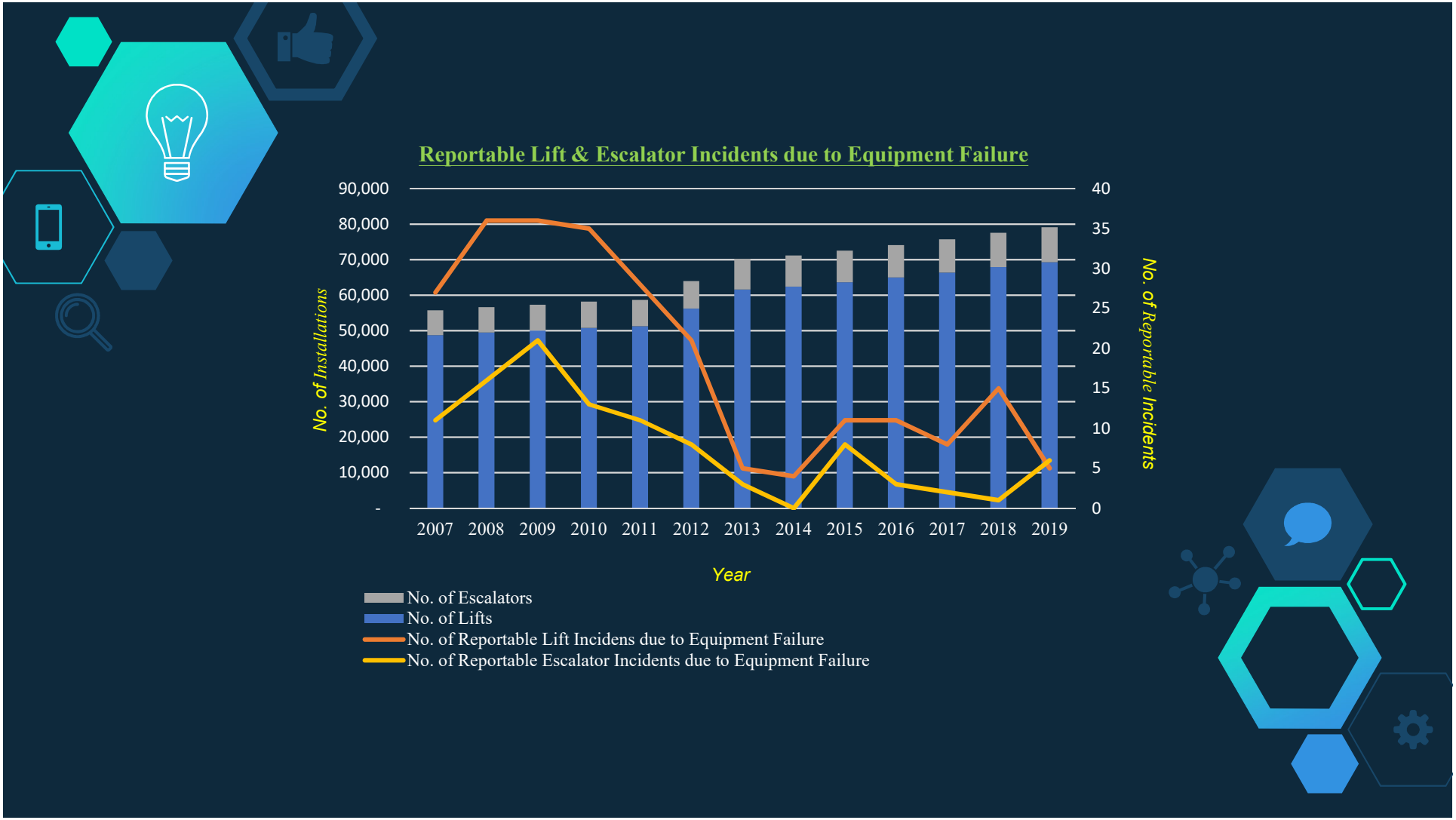
EMSD

41 nos. Registered Lift & Escalator Contractors

28,900 nos. Audit Inspection Target

RISK BASED INSPECTION MODEL

Sampling Inspection	Event Driven Inspection
✧ Sub-contracting works	✧ New installation works
✧ Change of maintenance contractors	✧ Major alteration works
✧ Periodic examination works	✧ Complaints
✧ Reportable incidents (other than due to equipment failure, e.g. passenger behaviour or external factors)	✧ Reportable incidents (due to equipment failure or public/ media concern)
✧ Routine maintenance works	✧ Long escalators
✧ Lift locations with low maintenance price	
✧ Other factors	

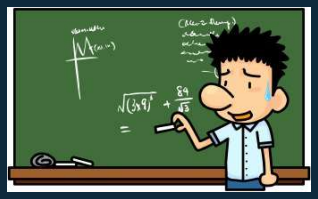

Reportable Lift & Escalator Incidents due to Equipment Failure
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
-
No. of Installations
40
35
30
25
20
15
10
5
0
No. of Reportable Incidents
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Year
No. of Escalators
No. of Lifts
No. of Reportable Lift Incidens due to Equipment Failure
No. of Reportable Escalator Incidents due to Equipment Failure

MODERNISATION OF AGED LIFTS

- >50% lifts have been in service for more than 20 years
- Lift Modernisation Resource Corner

  https://www.emsd.gov.hk/en/lifts_and_escalators_safety/responsible_persons_corner/lift_modernisation_resource_corner/index.html

- Tight workforce in the trade
- Lack of financial & technical support to lift owners
- Difficulty of lift owners in reaching consensus

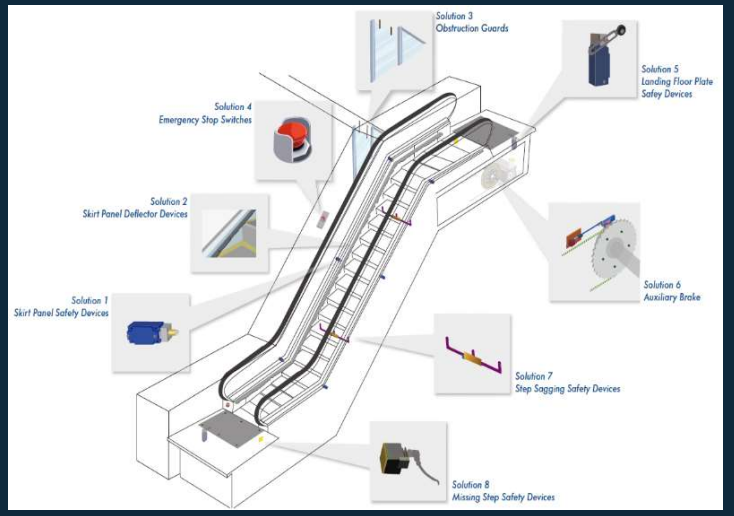


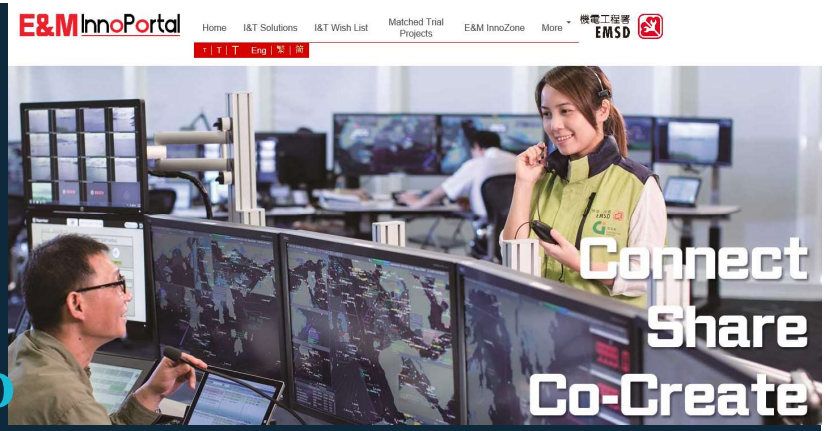
STEP-UP MEASURES TO ENHANCE THE SAFETY OF AGED LIFTS

- To conduct “special maintenance ” for aged lifts twice a year with effect from 1 February 2019
- Feasibility study on implementation of mandatory lift modernisation
- Engaged the Urban Renewal Authority to launch a HK$2.5 billion Lift Modernisation Subsidy Scheme (“LIMSS”) in March 2019 to modernise about 5000 aged lifts in six years commencing from 2019-20
- To expand the LIMSS to gradually modernise about 3000 additional aged lifts by 2025-26.

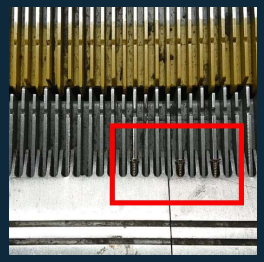
MODERNISATION OF AGED ESCALATORS

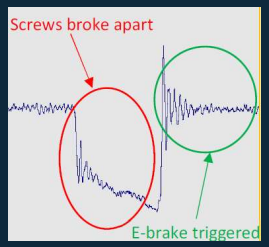
1. Install an auxiliary brake
2. Install step sagging safety devices
3. Install missing step safety devices
4. Install skirt panel safety
5. Install landing floor plate safety devices
6. Install emergency stop switches
7. Install skirt panel deflector devices
8. Install obstruction guards



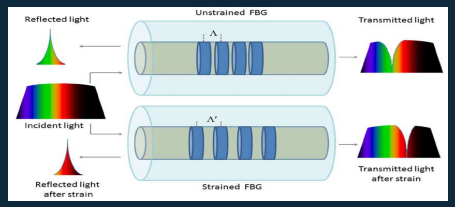


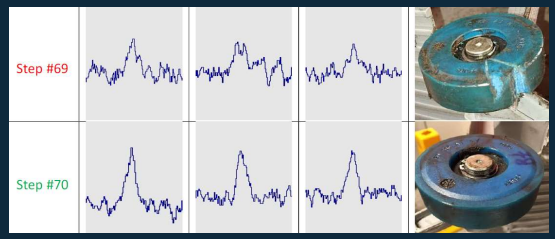
APPLICATION OF NEW AND INNOVATION TECHNOLOGIES





- "E&M InnoPortal" - Over 50 cases of successful matched I&T trial projects involving a total estimated project sum of HK$ 35 million (e.g. Identifying small obstacles jamming at the comb-plates of escalators by video analytics)
- Successful bidding of projects from *TechConnect (Block Vote)* (e.g. Optical Fiber Bragg Grating sensing technology for early detection of abnormal operation of lifts/escalators)





LIFT/ESCALATOR SAFETY REQUIRES THE CONCERTED EFFORTS OF ALL STAKEHOLDERS

- Government
- RPs
- Trade Practitioners
- Training Institutions
- Passengers

~Thank You~