ANNEX - FACTSHEET ON THE REGULATORY REGIME FOR LIFTS AND ESCALATORS IN SINGAPORE

A. Existing Regulatory Controls

1. There are a total of about 59,000 passenger lifts in Singapore. Lifts and escalators, like most mechanical devices, require regular and proper maintenance to ensure safety and reliability of use.

2. The **existing regulatory controls for lifts** are found in two Acts: the Building Control Act (BC Act) and the Building Maintenance and Strata Management Act (BMSMA).

3. Under the BC Act, the design and installation of lifts are submitted to BCA for approval as part of the building plans. Before applying for the Temporary Occupation Permit (TOP) or the Certificate of Statutory Completion (CSC), a PE (Mechanical) or PE (Electrical)[1] will submit a certificate certifying that the lift has complied with the design requirements under the Building Control Act.

4. Subsequently, the operation and maintenance of lifts is regulated under the BMSMA. Under the BMSMA, the owner must annually engage a registered lift contractor to examine, inspect and test the lift in the presence of an Authorised Examiner[2] (AE) before it may be operated. The owner also has to lodge annually with the Commissioner of Buildings, a Certificate of Lift Maintenance and Testing certified by the AE.

5. For the more than 6,000 escalators in Singapore, the **existing regulatory controls** are found in the BC Act, which regulates the design and installation of escalators. When the escalators are in operation, building owners will maintain the escalators monthly and the code SS CP 15 provides guidance on the maintenance works to be carried out.

B. New Regulatory Regime for Lifts

Monthly Maintenance

6. All lift owners are required to engage a lift contractor registered with BCA to maintain their lifts monthly and in accordance with the requirements in the codes and standards. In addition, registered lift contractors will have to maintain lifts according to 20 specific maintenance outcomes as shown in Table 1.

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Table 1: Maintenance Outcomes for lifts

Areas of maintenance	*Requirements*
1. Door open control	(*a*) When lift car doors and lift landing doors are opened and the button controlling the opening of those doors is pressed, the opened lift car doors and lift landing doors

[1] PE(Mechanical) and PE(Electrical) are professional engineers registered with the Professional Engineers Board under the discipline of mechanical and electrical engineering respectively.

[2] AEs are PE(Mechanical), who have to separately register with the Ministry of Manpower under the Workplace Safety and Health Act for the inspection of hoists and lifts.

Areas of maintenance	*Requirements*
	must stay open. (*b*) When lift car doors and lift landing doors are partially closed and the button controlling the opening of those doors is pressed, the partially-closed lift car doors and lift landing doors must reopen.
2. Door protective devices	Lift car doors and lift landing doors must be operational at all times and reopen upon activation of door protective devices.
3. Lift car doors and lift landing doors	(*a*) Lift car movement must only be allowed when both the lift car doors and landing doors are closed and locked, and — (i) the gap at lift car doorway is not more than 12 mm; (ii) The upthrust rollers of the lift car doors must be set such that, when there is an obstruction at the lift car door sill, there cannot be a gap at the lift car doorway of more than 25 mm for a lift entrance height of 2.1 m. For a lift entrance height of more than 2.1 m, the width of the gap may be increased by 3 mm for every 0.5 m increment in lift entrance height; (iii) the gap at lift landing doorway is less than 10 mm; (iv) the clearance between lift car door panels is less than 10 mm; and (v) the clearance between lift car door panels and uprights, lintels or sills, is less than 10 mm. (*b*) When lift landing doors are detected to be opened or unlocked during lift car movement, an emergency stop must be initiated immediately. (*c*) When lift car doors are detected to be opened during lift car movement, an emergency stop must be initiated immediately. (*d*) There must be no signs of excessive wear and tear of lift car doors and lift landing doors (or any component of the lift car door or lift landing door, including doors hoes, rollers, hangers and linkages).
4. Lift car emergency alarm	When lift car emergency alarm button is pressed, the alarm must be audible from — (*a*) outside the lift well; and (*b*) the designated floor as defined in SS 550:2009.
5. Lift car intercom	When lift car intercom button is pressed, the intercom system must function as intended
6. Emergency power supply for lift car lighting and ventilation	Emergency power supply for lift car lighting and ventilation fan must remain functioning when normal power supply to lift car is disrupted.
7. Movement of lift car	Abnormal sounds or vibrations must not occur during any

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Areas of maintenance	*Requirements*
	movement of the lift car.
8. Housekeeping	Machinery, machinery space, lift pit, hoistway and lift car top must be kept clean, tidy and free from discarded items and debris.
9. Lift machine and drive (including motor, gear box, drive sheave and motor generator set)	(*a*) Oil leakage must not occur in lift machine and drive. (*b*) Moveable parts, joints and gear box must be sufficiently lubricated. (*c*) Lift machine and drive must be securely mounted.
10. Brakes of lift machine and drive	(*a*) Brakes must not be contaminated with, or be at risk of being contaminated with, any oil or grease. (*b*) Brakes, when activated, must cause lift car to slow down, stop and stay at stopping position (*c*) If lift is fitted with additional brake system for preventing uncontrolled lift car motion, the brake, when activated, must cause the lift car to stop and stay at stopping position.
11. Direct current machine	(*a*) Carbon brush length must be within the tolerance as recommended by the manufacturer. (*b*) Insulation at carbon brush holders must not show any sign of carbon particle build-up which may cause flash-over and burning. (*c*) The commutator must be free from any foreign deposit and must not cause any sparking when in operation.
12. Overspeed governor	(*a*) At all times when lift is in operation, overspeed governor must function as intended and be able to activate lift safety gears. (*b*) Governor ropes must not show any sign of excessive wear and tear, in accordance with manufacturer's recommendations or, where manufacturer's recommendations are not available, the requirements in ISO 4344:2004[3].
13. Main rope and compensation rope	(*a*) Main rope must be properly and equally tensioned. (*b*) Main rope and compensation rope must not show any sign of excessive wear and tear, in accordance with manufacturer's recommendations or, where manufacturer's recommendations are not available, the requirements in ISO 4344:2004.
14. Compensation rope and compensation rope sheave tie-down and tensioning	At all times when lift is in operation, compensation rope and compensation rope sheave tie-down must be properly tensioned and guided, in accordance with manufacturer's recommendations.

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[3] ISO 4344 is the standard on steel wire ropes for lifts issued by the International Organization for Standardization that spells out the minimum requirements on rope maintenance and rejection criteria.

Areas of maintenance	*Requirements*
15. Buffer	(*a*) There must be sufficient oil in buffer, as indicated by oil level gauge, in accordance with manufacturer's recommendations. (*b*) Buffer must provide effective cushioning upon impact to protect passengers in lift car at all times when lift is in operation.
16. Controller and electrical system	(*a*) Ground and earth of controller and electrical system must be firmly secured. (*b*) Controller must initiate immediate stopping of lift car and prevent lift movement under any condition that is unsafe to passengers and maintenance workers. (*c*) Safety switches must function as intended at all times when lift is in operation.
17. Guide shoes or rollers of lift car and counterweight	(*a*) Lift car and counterweight must be guided by guide shoes or rollers at all times when lift is in operation. (*b*) Guide shoes or rollers must not cause wear and tear of guide rails.
18. Safety gear	(*a*) Safety gear must be maintained and functioning at all times when lift is in operation. (*b*) Safety gear, when activated, must be able to stop and hold the lift car and counterweight within the allowable distance in accordance with SS 550:2009.
19. All lift parts	Level of corrosion, wear and tear of all parts of a lift must not affect the safe operation of the lift.
20. Stopping or level accuracy	The stopping accuracy of the lift car floor must be ± 10mm.

7. Under the new regime, lift owners will also be required to keep maintenance records for a period of at least 5 years and make them available for BCA's inspection when required.

Annual examination, inspection and testing of lifts

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8. The annual examination, inspection and testing of lifts must be carried out by a registered lift contractor in the presence of an independent Authorised Examiner (AE) who is not an associate, partner, director or employee of the lift owner or lift contractor, according to the requirements, codes and standards. This AE is a professional engineer who is registered with the Ministry of Manpower in the competency area of lifts and hoists.

New Permit-to-Operate system for lifts

9. Upon examination, inspection and testing by a registered lift contractor in the presence of an independent AE, the AE will issue a certificate to certify that the lift is in a good working condition. The lift owner will need to apply to BCA for a Permit to Operate (PTO) together with this certificate and other supporting documents for the lift.

10. BCA may carry out an inspection or direct a re-test or request for additional documentation during the application process, before issuing the PTO for the lift to operate. The PTO must be renewed annually. PTOs issued by BCA will specify the last examination,

inspection and testing date and the name of the AE who did the examination, inspection and testing.

11. From 1 September 2017, lift owners are required to display the PTOs in a prominent manner and in a conspicuous location in the lifts.

Mandatory Incident Reporting

12. Other than the new requirements for monthly maintenance and the annual PTO, both the lift owner and registered lift contractor who carried out the most recent servicing work on the lift must inform BCA as soon as practicable, when an incident involving death or injuries to passengers, or malfunction of safety critical components occurs. Upon notification, BCA will investigate into the incident and may direct the registered lift contractor or the lift owner to engage an independent AE to determine the cause of the incident.

C. New Regulatory Regime for Maintenance of Escalators

13. From 1 November 2016, all escalator owners are required to engage an escalator contractor who is registered with BCA* to maintain their escalators every month and in accordance with the requirements in the codes and standards as specified in CP 15:2004. In addition, registered escalator contractors will have to maintain escalators according to ten specific maintenance outcomes as shown in Table 2 below.

*Before 1 November 2016 escalator contractors must register with BCA before undertaking any maintenance or testing under the new Regulations.

Table 2: Maintenance Outcomes for escalators

Areas of maintenance	***Requirements***
1. Signage and indicator	(*a*) Safety signage and direction indicator must be clearly and prominently displayed. (*b*) Edge of escalator step must be clearly demarcated with yellow lines. (*c*) There must be sufficient lighting in the vicinity of escalator combs.
2. Anti-climbing, anti-sliding, access restriction and deflecting devices	Anti-climbing, anti-sliding, access restriction and deflecting devices must be in place and must effectively serve their intended purposes.
3. Emergency stop switch	Activation of emergency stop switch must initiate emergency stopping of escalator.
4. Handrail system	(*a*) Handrail must move in the same direction and speed (within a speed tolerance of ±2%) as escalator steps. (*b*) Handrail inlet safety switch must be activated if a foreign object enters inlet and must cause escalator to initiate emergency stop.
5. Housekeeping	All machinery and machinery space in driving station, return station and truss area must be kept clean, tidy and free from discarded items and debris.
6. Driving machine,	(*a*) Machinery must not have any oil leakage.

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Areas of maintenance	*Requirements*
brakes, sprocket and auxiliary brake	(*b*) Moveable parts, joints and gear-box must be sufficiently lubricated. (*c*) Brakes, when activated, must stop the escalator within the distance specified in SS CP 15:2004. (*d*) All machinery must be securely mounted.
7. Safety switch and sensor (such as skirt panel switch, escalator comb switch, step sag switch, step up thrust switch, missing step detection device, floor plate or access cover detection switch, drive chain tension and step chain tension monitoring switch)	Activation of safety switch must cause escalator to initiate emergency stop
8. Excessive speed and unintentional reversal protection	(*a*) Emergency stop must be activated when speed of escalator steps exceeds rated speed by 20 percent.
9. Operational clearance	Clearance between escalator step and escalator skirt panel, clearance between escalator step and escalator comb, and all other clearances must comply with SS CP 15:2004 requirements.
10. All escalator parts	Level of corrosion, wear and tear of all parts of an escalator must not affect the safe operation of the escalator.

14. Under the new regime, escalator owners will also be required to keep maintenance records for a period of at least 5 years and make them available for BCA's inspection when required.

Examination, inspection and testing of escalators

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15. Similar to lifts, escalators are now required to undergo annual examination, inspection and testing by a registered escalator contractor in the presence of an independent AE, in accordance with requirements stipulated in CP 15:2004.

New Permit-to-Operate system for escalators

16. Upon examination, inspection and testing by a registered escalator contractor in the presence of an independent AE, the AE will issue a certificate to certify that the escalator is in a good working condition for operation. The owner will need to apply to BCA for a PTO together with this certificate and other supporting documents for the escalator.

17. The deadline for escalator owners to obtain the PTO will be done in five phases based on the Certificate of Statutory Completion (CSC) date of the building as follows:

Obtain PTO in 5 phases	Deadline for obtaining PTO
1) Escalators in buildings which obtained CSC before 1 May 1989	31 January 2017
2) Escalators in buildings which obtained CSC between 1 May 1989 and 31 December 2000 (inclusive)	30 April 2017
3) Escalators in buildings which obtained CSC between 1 January 2001 and 31 December 2010 (inclusive)	31 October 2017
4) Escalators in buildings which obtained CSC on or after 1 January 2011	31 January 2018
5) Escalator that is in any structure, or used in connection with any structure	31 January 2018

18. The first phase will commence with buildings that received CSC before 1 May 1989. Owners of these buildings must obtain the permit to operate by 31 January 2017. The other three subsequent phases involve buildings that received CSC after 1 May 1989, 1 January 2001 and from 1 January 2011 onwards, wherein owners must obtain the permit to operate their escalators by 30 April 2017, 31 October 2017 and 31 January 2018 respectively. All other escalators that are in other structures, or used in connection with other structures must obtain the permit by 31 January 2018.

19. Escalator owners are required to display this PTO in a prominent manner and in a conspicuous location at or near the escalator from 1 March 2018.

Mandatory Incident Reporting

20. Similar to the lift regulatory regime, both the escalator owner and the registered escalator contractor who carried out the most recent servicing work on the escalator must inform BCA as soon as practicable, when an incident involving any death or injuries to passengers, or malfunction of safety critical components occurs.

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