

# MAINTENANCE AND MODERNISATION OF LIFTS AND ESCALATORS IN PUBLIC RENTAL HOUSING ESTATES

## Executive Summary

1. One of the Hong Kong Housing Authority (HA)'s missions is to provide an age-friendly and barrier-free estate environment to address the needs of residents of different ages and physical abilities. Lifts and escalators can enhance the mobility of tenants of public rental housing (PRH) estates. As at 30 June 2023, the Housing Department (HD) managed about 774,500 PRH flats located in 193 PRH estates and maintained 6,056 lifts and 277 escalators. Maintenance of lifts and escalators maintained by HD is carried out by the original manufacturers/installers for their specific lift or escalator (L/E) brands (i.e. proprietary maintenance) in the form of ongoing term maintenance contracts (TMCs). As at 30 June 2023, there were 11 and 9 TMCs for the maintenance of lifts and escalators in PRH estates respectively. The total maintenance expenditure in 2022-23 was \$763.2 million.

2. Since 1988, HA has implemented an on-going Lift Modernisation (LM) Programme for lifts maintained by HD which calls for a complete replacement of the lift installation. From 2018-19 to 2022-23, a total of 27 contracts, involving 382 lifts, with a total contract sum of \$652.2 million were awarded to 6 contractors. In addition, HA has conducted safety enhancement works for lifts and escalators to retrofit them with the latest safety devices as recommended by the Electrical and Mechanical Services Department (EMSD) since 2020 and 2018 respectively. The Audit Commission (Audit) has recently conducted a review to examine the L/E safety in PRH estates.

### Maintenance of lifts and escalators

3. *Need to continue enhancing the serviceability and the monitoring measures of lifts and escalators.* According to TMC, in case of any breakdown of an L/E, the contractor is required to attend to and check the causes, and record all breakdowns in log-books. Of the 31,364 and 1,539 breakdowns of lifts and escalators from 1 January 2020 to 30 April 2023, services had been suspended for over 2 days

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in 219 (0.7% of 31,364) and 25 (1.6% of 1,539) cases respectively. Audit analysed the 219 breakdowns of lifts and the 25 breakdowns of escalators and found that: (a) 3 lifts had service suspended for over 60 days, ranging from 72 to 89 days; and (b) 7 lifts had service suspended for over 2 days twice within 6 months, with a total suspension period ranging from 5 to 9 days for each lift (paras. 2.2 and 2.3).

4. ***Inadequate coverage of assessments conducted by the District Maintenance Offices (DMOs) and the Property Services Agents (PSAs).*** The maintenance services of L/Es provided by the contractors include routine maintenance, quarterly inspection, periodic examination, full-load safety test, brake load test, and emergency call services and repairs. According to HD's inspection guidelines, DMOs and PSAs are responsible for the routine monitoring of L/E contractors. Their duties include conducting routine assessment and half-yearly assessment each year for all lifts to assess their conditions. Audit found that of the 5,829 and 5,891 lifts subject to routine and half-yearly assessments as at 31 December 2021 and 2022, neither routine assessments nor half-yearly assessments had been performed on 21 and 26 lifts in 2021 and 2022 respectively. Of which, no assessment had been conducted for 3 lifts in both years (paras. 2.7, 2.14 and 2.15).

5. ***Room for improvement in inspections conducted by HD headquarters staff.*** According to HD, in order to monitor contractors' performance at the headquarters level, surprise checks and additional lift inspections are performed by the Central Services Team (CST) under the Estate Management Division. From January 2022 to April 2023, a total of 27 surprise checks and 8 additional lift inspections were conducted (paras. 2.16, 2.18 and 2.20). Audit's examination revealed the following inadequacies/areas for improvement:

- (a) ***Surprise checks.*** CST had not set any timeframe for DMOs/PSAs to follow up the rectification of the defects identified in the surprise checks. Of the 27 surprise checks: (i) while the defects were rectified and DMO issued the Notification of Completion to CST on the same date of surprise check report in one case, DMOs/PSAs took 7 to 128 days (averaging 30 days) to issue the Notification of Completion to CST for the remaining 26 cases; and (ii) in 10 surprise checks involving 83 defects, 13 (16% of 83) defects were in fact not yet rectified/followed up at the time of issuing the Notification of Completion. As of September 2023, 11 of the 13 defects were rectified while 2 involving improvement works would be followed up during LM works (para. 2.18); and

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- (b) ***Additional lift inspections.*** CST would carry out additional lift inspections when the monthly scores of the assessment scoring system of a lift contractor are staying below the lowest acceptable scores for three consecutive months. Audit's examination of the 8 additional lift inspection reports and the respective Notification of Completion found that in 6 inspections involving 113 defects identified, 20 (18% of 113) defects were in fact not yet rectified at the time of issuing the Notification of Completion by DMOs/PSAs. As of September 2023, 19 of the 20 defects were rectified while the remaining one involving improvement works would be followed up during LM works (paras. 2.19 and 2.20).

6. ***Room for improvement in inspections conducted by the Lift Inspection Focus Team.*** The Lift Inspection Focus Team has been set up under the Head of Independent Checking Unit for carrying out independent checks. Upon the completion of each independent check, the Focus Team will issue a list of defects/outstanding items to DMO/Property Service Administration Unit (PSAU) for follow-up actions and request for a reply within 30 days. For outstanding replies, the Focus Team will issue reminders on a monthly basis. From January 2022 to April 2023, the Focus Team conducted independent checks for 853 L/Es maintained by HD. Audit examined 15 independent check reports involving 29 lifts and found that DMOs/PSAUs did not reply to the Focus Team within 30 days in 8 (53%) of the 15 independent checks, with delays ranging from 2 to 29 days. Of the 8 independent checks, the Focus Team failed to issue reminders to the respective DMOs/PSAUs timely in 3 cases, with delays ranging from 7 to 25 days, contrary to the guidelines stipulated in the procedural manual (paras. 2.21 and 2.22).

7. ***Need to remind the contractors to follow the requirements on the submission of quarterly inspection reports stipulated in TMCs.*** According to TMCs, the contractors shall submit a quarterly inspection report on the condition for each L/E under their maintenance to HD. Audit noted that, in the 53 submissions by the 11 L/E contractors from January 2022 to March 2023, there were delays in 22 (42%) submissions (involving 8 L/E contractors). The delays ranged from 1 to 203 days (averaging 48 days). Audit also examined 44 quarterly inspection reports submitted by L/E contractors for inspections conducted in the third and fourth quarters of 2022 and noted that in 32 (73%) reports, Registered L/E Engineers had not certified whether or not L/Es were in a safe, satisfactory and serviceable condition, contrary to the provisions in TMCs. Furthermore, 8 of the 32 reports were not duly signed by a Registered L/E Engineer (paras. 2.25 to 2.27).

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8. *Need to monitor the checking frequency of all main maintenance items.* According to the Code of Practice for Lift Works and Escalator Works issued by EMSD in 2021, L/E contractors should explain to the Responsible Persons the maintenance schedule, which lists out all maintenance items that must be checked during periodic maintenance and the frequency of checking for Responsible Persons' reference. There are 8 main items that must be checked during periodic maintenance for a lift. Audit examined the maintenance schedules and the log-book records for 7 lift contractors (sample checked 1 lift for each contractor) from January to December 2022 and found that 6 lift contractors did not fully meet the checking frequency of all 8 main items in accordance with the maintenance schedules (paras. 2.31 and 2.32).

### Lift Modernisation Programme

9. *Need to enhance documentation of the justifications in determining the priority of lift replacement works.* Under LM Programme, HA evaluates the performance of all lifts maintained by HD which have been in use for 25 years or more and sets priority for LM works. By the end of each calendar year, technical evaluation reports for lifts with service years of 25 or more are prepared by DMOs/PSAs for assessing whether there is imminent need to modernise the lifts and submitted to the Lift Modernisation Technical Vetting Committee (LMTVC) for recommending an LM Programme. The LM Programme will then be submitted to the Maintenance Planning and Review Committee for approval. Audit examined the records of LMTVC meeting held in February 2023 on the discussion of the provisional LM Programme of 2024-25 (including the technical assessment of 986 lifts) and found that: (a) LMTVC accepted DMOs/PSAs' suggestions of all the 55 lifts to be included in the provisional LM Programme of 2024-25; and (b) of the remaining 931 lifts not suggested by DMOs/PSAs, 36 lifts were also included in the provisional programme but the justifications had not been recorded in the LMTVC meeting minutes (paras. 3.2, 3.5, 3.6 and 3.8).

10. *Some aged lifts not included in LM Programme in/before 2024-25.* As at 30 June 2023, there were 104 lifts maintained by HD with service years of 35 or more. While all the 64 lifts in domestic premises were planned for LM works in/before 2024-25, 35 out of 40 lifts in non-domestic premises with service years of 35 or more were not planned for LM works in/before 2024-25. Of the 35 aged lifts, 33 had been tentatively scheduled for replacement under LM Programme from 2025-26 to 2031-32 and 2 had not been included in LM Programme. Audit noted that

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these 2 lifts (Lifts A and B) were located in Shopping Centre A in a PRH estate and were installed in 1978 with service years of 46 as at 30 June 2023. In November 2020, the Buildings Department issued some comments on the fire safety improvement proposal of Shopping Centre A in relation to the Fire Safety (Commercial Premises) Ordinance (Cap. 502). In December 2021, HD's proposal of converting Lift A to a fireman's lift was accepted in principle by the Buildings Department. According to HD, major improvement works was planned to upgrade for the provision of a fireman's lift, together with the provision of safety enhancement devices in Lift A by partial LM works. The project team would further review the scope of the partial LM works in Shopping Centre A in conjunction with the fire safety improvement works, and work out the implementation programme (paras. 3.9 and 3.10).

11. ***Prolonged lift shut-down period for LM works.*** As lift contractors are responsible for lift replacement (and minor building supporting works) while district term contractors are responsible for building works, there are numerous site handovers between them. Since 2013, a streamlined process for LM works has been implemented by HD to reduce the number of site handovers with the aim to shorten the shut-down period of lifts undergoing LM works from 10.5 to 7.5 months. Audit analysed the shut-down period for the 238 lifts with LM works completed during the period from 2018-19 to 2022-23 and noted that: (a) 1 (0.4%) lift had been shut down for 7.5 months or less; (b) 188 (79.0%) lifts had been shut down for more than 7.5 to 10.5 months; and (c) 49 (20.6%) lifts had been shut down for more than 10.5 to 14.5 months. Furthermore, of the 238 lifts, 190 (80%) had not resumed service by the planned completion dates as stated in the contracts, resulting in delays in lift resumption of 2 to 169 days (averaging 32 days) (paras. 3.18 to 3.20).

12. ***Need to resume lift services as soon as possible after obtaining use permits.*** Upon completing new lift installation, a use permit should be obtained from EMSD so that the lift could be opened for public use. Audit compared the actual lift service resumption dates with the issue dates of the use permits for the 238 lifts with LM works completed during the period from 2018-19 to 2022-23 and found that: (a) 12 (5%) lifts resumed service on the dates the use permits were issued; (b) 47 (20%) lifts took 1 to 10 days to resume service after obtaining use permits; (c) 149 (63%) lifts took 11 to 30 days to resume service after obtaining use permits; and (d) 30 (12%) lifts took more than 30 days to resume service after obtaining use permits (para. 3.21).

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### Other safety enhancement measures for lifts and escalators

13. ***Room for improvement in lift safety enhancement works.*** In 2020, HA commenced the lift safety enhancement works to equip the lifts maintained by HD with the 3 latest safety devices (i.e. double brake system, unintended car movement protection device and ascending car overspeed protection device) as promulgated in EMSD's Guidelines. At the time prior to the commencement of the lift safety enhancement works in 2020, 3,685 lifts were not fully equipped with the 3 latest safety devices. HD shortlisted 1,871 lifts as prioritised items to be enhanced by 2031-32 (paras. 4.2 and 4.4). Audit noted that:

- (a) up to 30 June 2023, of the 1,871 lifts, enhancement works were completed for 318 (17%) lifts (para. 4.4(a)); and
- (b) according to the results of the trial projects in 2019 and 2020 for the lift safety enhancement works, the shut-down period of each lift for undergoing the lift enhancement works was normally around 4 to 6 weeks. Of the 318 lifts with safety enhancement works completed up to 30 June 2023, 52 (16%) took more than 6 weeks to complete the enhancement works (para. 4.5).

14. ***Need to conduct periodic overhaul of escalators in accordance with HD's Instruction.*** In 2003, HD imposed a requirement of periodic overhaul of all escalators which requires the complete dismantling of escalators for cleaning, checking, inspection and replacement of any moving parts with excessive wear and tear. Each escalator should be overhauled 3 years after the expiry of the maintenance period stated in the contracts. Subsequent overhauls for an escalator should be carried out once every 3 years normally. While the interval between two successive overhauls can be adjusted, it shall not in any case be more than 6 years (para. 4.9). Audit examined the periodic overhauls of the 277 escalators maintained by HD as at 30 June 2023 and noted that:

- (a) of the 81 (29%) escalators with only one overhaul conducted after the maintenance period, 74 (91% of 81) escalators had their overhaul conducted more than 3 years after the expiry of the maintenance period (para. 4.10(b)); and

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- (b) of the 131 (47%) escalators with 2 or more overhauls conducted after the maintenance period, 76 (58% of 131) and 16 (12% of 131) escalators had their latest overhaul conducted more than 3 years but within 6 years and more than 6 years after the previous overhaul respectively (para. 4.10(c)).

### **Audit recommendations**

15. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Director of Housing should:**

#### *Maintenance of lifts and escalators*

- (a) **take measures to continue enhancing the serviceability and the monitoring measures of lifts and escalators as far as practicable (para. 2.5);**
- (b) **take measures to ensure that the routine assessments and half-yearly assessments are conducted in accordance with the requirements stipulated in HD's inspection guidelines (para. 2.23(b));**
- (c) **stipulate timeframe for issuing the Notification of Completion by DMOs/PSAs for surprise checks (para. 2.23(c));**
- (d) **enhance monitoring of the implementation of improvement works identified in the surprise checks and the additional lift inspections during LM works (para. 2.23(d));**
- (e) **take measures to ensure that reminders for outstanding replies from DMOs/PSAs are issued by the Lift Inspection Focus Team in accordance with HD's procedural manual (para. 2.23(e));**
- (f) **remind the contractors to follow the requirements on the submission of quarterly inspection reports stipulated in TMCs (para. 2.29);**
- (g) **take measures to monitor the checking frequency of all main items so that it meets the frequency as stated in the maintenance schedules (para. 2.36(a));**

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### *Lift Modernisation Programme*

- (h) enhance the documentation of the justifications in determining the priority of lift replacement works under LM Programme in order to better support evidence-based decision made by LMTVC (para. 3.13(a));
- (i) expedite the partial LM works in Shopping Centre A in conjunction with the fire safety improvement works (para. 3.13(b));
- (j) keep in view the need of carrying out full/partial modernisation works for aged lifts included in the tentative long-term LM Programme, taking into consideration factors such as breakdown rates, technical feasibility, cost effectiveness and suspension time (para. 3.13(c));
- (k) take measures to reduce the lift shut-down period in order to minimise the disruption to lift users as far as practicable and resume the lift services as soon as possible after obtaining the use permits (para. 3.23(b) and (c));

### *Other safety enhancement measures for lifts and escalators*

- (l) continue to closely monitor the progress of the lift safety enhancement works and complete the works for the prioritised items in accordance with the planned programme as far as practicable (para. 4.7(a));
- (m) endeavour to shorten the shut-down period of lifts for lift safety enhancement works as far as practicable (para. 4.7(b)); and
- (n) continue to monitor the periodic overhauls of escalators such that the overhauls are conducted in accordance with HD's Instruction (para. 4.12).

## Response from the Government

16. The Director of Housing agrees with the audit recommendations.