

# BUILDING AND CONSTRUCTION AUTHORITY (BCA)

## ANNUAL LIFT AND ESCALATOR SAFETY SEMINAR

16 January 2024 9:00 AM – 12:30 PM

S/N	Issue Raised	Response
1)	<p><b>Common findings from Lift and Escalator Audit Inspections and Sharing of Incidents</b></p> <p>BCA presented common findings observed during maintenance audit inspections conducted by BCA from October 2022 to September 2023. Case studies of L&amp;E incident cases, findings, and key learning points were also shared with participants.</p>	
	No questions regarding this item were raised.	
2)	<p><b>Future Ready the Industry on Regulatory Submission – Sharing on Testing &amp; Commissioning (T&amp;C) Findings, Plans and Building Information Modelling (BIM) Trial</b></p> <p>BCA presented on the requirements under the Fixed Installation (FI) Plan Submission Regime and key observations from the FI Design Submission Trial as well as the T&amp;C audits for new lift installations. Firms are also encouraged to onboard the design plans submission trials and proactively schedule T&amp;C inspections with BCA once the site or lift is ready.</p>	
1	In the case of partial upgrading or modernisation of a lift, participants asked whether components which were retained need to comply with the latest code.	Any major alteration or replacement carried out on an existing lift must meet the respective standard specified in the Part 2 of the Second Schedule of the Building Maintenance and Strata Management (Lift, Escalator and Building Maintenance) Regulations (refer to as “LEBM Regs”).

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2	For a modernisation project, a participant asked whether type testing certificates are required to be submitted for all safety components or for replaced components only.	Currently, type testing certificates for the replaced components are not required to be submitted for modernisation projects.
3	A participant asked whether BCA requires details of refuge space on car top and lift pit to be shown on BIM and 2D design drawings.	Details of refuge spaces on car top and lift pit are required to be indicated on BIM and 2D design drawings.
4	A participant shared that Architectural BIM models of existing buildings are usually unavailable for modernisation projects. If BCA were to mandate BIM submission, the participant queried whether this requirement would apply to modernisation projects.	For modernisation projects, BIM submission is not mandatory as the change in GFA usually does not exceed 5,000 sqm.  Notwithstanding this, industry is encouraged to adopt BIM modelling so that any pre-construction clashes can be observed and resolved before actual works are carried out on site to reduce abortive works.
5	With regard to the full load test conducted during BCA's T&C audits, a participant queried if BCA could consider conducting	BCA will take such requests into consideration when scheduling T&C audits.

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	one full load test together with the SPE so as to reduce damage to the guiderails.	
6	A participant asked whether advanced technology to simulate full load testing of lifts could be used to replace the physical test.	The use of such technologies to simulate full load testing of lifts is currently not accepted. Relevant parties may provide more details on such technologies for BCA's review.
<p><b>3) Towards a High-Tech &amp; Productive Lift Industry with Remote Monitoring &amp; Diagnostics (RM&amp;D)</b></p> <p><b>a. JTC's Adoption of RM&amp;D Technology and Quarterly Lift Maintenance</b></p> <p>JTC shared their experience adopting RM&amp;D solutions for their lifts, as well as the scope, cost structure, and KPIs for their quarterly maintenance contracts.</p> <p><b>b. Outcome-Based Contracting Guide for Lifts</b></p> <p>BCA presented on the value proposition of RM&amp;D and how its benefits could be further optimised with outcome-based contracting, whereby contract requirements are specified in terms of expected performance levels instead of fixed amounts of resources. Owners and contractors are encouraged to pivot to outcome-based contracting and may refer to BCA's guide on specifications for outcome-based lift maintenance contracts at: <a href="https://www1.bca.gov.sg/regulatory-info/lifts-escalators/outcome-based-contracting-for-lift-maintenance-contracts">https://www1.bca.gov.sg/regulatory-info/lifts-escalators/outcome-based-contracting-for-lift-maintenance-contracts</a>.</p>		
7	A participant sought clarification on JTC's RM&D KPIs.	Key KPIs relate to the interest of the users, such as equipment downtime, breakdown rate, reliability, and equipment restoration. Importantly, the method to compute KPIs should be fair and clear. For more details, please

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		<p>refer to the Code of Practice for Design and Performance of Remote Monitoring and Diagnostics Solution for Lifts at <a href="https://www1.bca.gov.sg/docs/default-source/docs-corp-regulatory/lifts-and-escalators-legislation/code-of-practice-for-design-and-performance-of-remote-monitoring-and-diagnostics-solution-for-lifts-(final).pdf?sfvrsn=cf5164cb_0">https://www1.bca.gov.sg/docs/default-source/docs-corp-regulatory/lifts-and-escalators-legislation/code-of-practice-for-design-and-performance-of-remote-monitoring-and-diagnostics-solution-for-lifts-(final).pdf?sfvrsn=cf5164cb_0</a>.</p>
8	<p>A participant queried whether BCA would review the quarterly maintenance requirement for RM&amp;D, as owners may be misled to think that there will be cost and manpower savings.</p>	<p>One of the objectives of introducing a longer maintenance interval for approved RM&amp;D lifts is to provide lift owners and contractors the flexibility in the maintenance of their lifts so that they could maximise the benefits of RM&amp;D for lift maintenance such as productivity savings.</p> <p>At the Lift and Escalator Safety Seminar, JTC shared that all 3 of the RM&amp;D solution providers working with them were able to achieve productivity gains of 20-25%.</p> <p>However, it should be noted that it would not be realistic to expect apparent manpower savings for the industry in general due to the implementation RM&amp;D now, as the number of approved RM&amp;D lifts is only a very small portion of the lift population. The lift maintenance contractors would still to</p>

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		<p>maintain more or less the same manpower size to service the bulk of the lifts which have been not onboarded with RM&amp;D solutions.</p>
9	<p>A participant asked what is monitored by TUV SUD's RM&amp;D solution as it is not an embedded solution, and whether BCA will allow quarterly maintenance for non-embedded solutions.</p>	<p>For an RM&amp;D solution to be approved for the quarterly maintenance, the RM&amp;D solution provider would have to demonstrate that the RM&amp;D solution is able to meet the requirements under the Code of Practice for Design and Performance of Remote Monitoring &amp; Diagnostics Solution, regardless of whether the RM&amp;D solution is an embedded solution or not.</p> <p>The list of RM&amp;D solution providers approved for the regulatory sandbox and pre-sandbox stage includes both type of solutions and can be found at: <a href="https://www1.bca.gov.sg/regulatory-info/lifts-escalators/remote-monitoring-diagnostics-for-lifts-in-singapore/list-of-approved-rm-d-solutions-and-rm-d-solutions-undergoing-trials">https://www1.bca.gov.sg/regulatory-info/lifts-escalators/remote-monitoring-diagnostics-for-lifts-in-singapore/list-of-approved-rm-d-solutions-and-rm-d-solutions-undergoing-trials</a>.</p> <p>For more information about TUV SUD RM&amp;D solution, please refer to the link below or contact them through the website below: <a href="https://www.tuvsud.com/en-sg/industries/real-estate/lifts-cranes-and-conveyors/lifts-and-escalators/lift-manager">https://www.tuvsud.com/en-sg/industries/real-estate/lifts-cranes-and-conveyors/lifts-and-escalators/lift-manager</a>.</p>

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10	A participant asked which RM&D solution provider is the most recommended out of those available.	<p>BCA has published a list of RM&amp;D solution providers which are currently on pre-approval trials and those that are approved for quarterly maintenance. This list is available at: <a href="https://www1.bca.gov.sg/regulatory-info/lifts-escalators/remote-monitoring-diagnostics-for-lifts-in-singapore/list-of-approved-rm-d-solutions-and-rm-d-solutions-undergoing-trials">https://www1.bca.gov.sg/regulatory-info/lifts-escalators/remote-monitoring-diagnostics-for-lifts-in-singapore/list-of-approved-rm-d-solutions-and-rm-d-solutions-undergoing-trials</a>.</p> <p>Lift owners may contact the individual RM&amp;D solution providers for more details.</p>
11	A participant noted that embedded RM&D solutions link to the controller, so cyber security is crucial to ensure that the safe operation of lifts are not compromised.	<p>International standards such as ISO 8102-20 specify cybersecurity requirements for lifts which are connected to external systems such as the Internet. ISO 8102-20 takes reference from IEC 62433 which addresses cybersecurity requirements for machinery in various industries such as manufacturing, energy, and transportation.</p> <p>BCA's Code of Practice for Design and Performance of RM&amp;D for Lifts also prescribes cybersecurity requirements for lifts, and requires that the RM&amp;D solution does not interfere with the lift's safety control function. This code of practice also takes reference from IEC 62433 and can be found at: <a href="https://www1.bca.gov.sg/docs/default-source/docs-corp-regulatory/lifts-and-">https://www1.bca.gov.sg/docs/default-source/docs-corp-regulatory/lifts-and-</a></p>

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		<a href="#">escalators-legislation/code-of-practice-for-design-and-performance-of-remote-monitoring-and-diagnostics-solution-for-lifts-(final).pdf?sfvrsn=cf5164cb_0.</a>
12	<p>A participant asked whether comprehensive contracts are recommended as outcome-based contracts.</p>	<p>Outcome-based contracts can maximise the benefits on the use of RM&amp;D as it assesses service levels based on performance metrics rather than number of visits. The RM&amp;D system may highlight issues requiring parts replacement as part of predictive maintenance. Having a comprehensive contract would be helpful in this aspect as the contractor is able to react to the issues highlighted in the RM&amp;D system more expeditiously as compared to a contract where the contractor needs to wait for approval for purchase of parts or for certain repairs to carry out.</p> <p>Owners who choose to adopt a standard contract on an outcome-based model should ensure timely approval of quotations. Should delays by the owner affect KPI scoring (e.g. more lift downtime), both the service buyer and service provider should mutually agree to exclude this from KPI calculation that month so as to not unfairly penalise the service provider.</p>

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		<p>Ultimately, owners are to decide which is the best approach based on their needs and preferences in managing their assets. Importantly, the KPIs prescribed in the outcome-based contracts should align with both the service buyer's and service provider's operating model.</p> <p>BCA's guide on specifications for outcome-based lift maintenance contracts can be found at: <a href="https://www1.bca.gov.sg/regulatory-info/lifts-escalators/outcome-based-contracting-for-lift-maintenance-contracts">https://www1.bca.gov.sg/regulatory-info/lifts-escalators/outcome-based-contracting-for-lift-maintenance-contracts</a>.</p>
<p><b>4) Recap of Circulars Issued in 2023</b></p> <p>BCA presented a recap of the circulars that were published in 2023, with emphasis on the key points conveyed in each circular.</p>		
13	<p>With reference to the circular requiring daily checks by L&amp;E owners, participants sought clarifications on the scope of checks expected from owners and if such daily checks are mandatory.</p>	<p>Under the LEBM Regs, besides ensuring that his lift or escalator is periodically maintained, and examined, inspected and tested, the owner of the equipment also has a duty to ensure that the equipment is kept in a good working condition at all times.</p> <p>For more information, please refer to the circular at: <a href="https://go.gov.sg/bca-circular-safe-ops-lne">https://go.gov.sg/bca-circular-safe-ops-lne</a>.</p>

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<b>5) Other Questions</b>		
14	A participant asked for an update on the Lift and Escalator Certification Firm (LECF) regime as well as its potential impact on L&E owners.	Details of the LECF regime are currently being worked out. BCA will provide more details and updates later.
15	A participant asked whether homing to an alternate designated floor, in the event of a fire emergency, is a requirement for vertical platform lifts (VPL).	<p>As advised by SCDF, under Section 6.6.6 of the Fire Code 2023, all lifts shall be brought to the designated floor (usually 1<sup>st</sup> storey). The lifts shall home to an alternate designated floor in the event of a fire at the designated floor. This applies to passenger, service, goods, designated fire lifts, designated evacuation lifts, and VPLs.</p> <p>However, the homing requirement does not apply to VPLs installed in Purpose Group I (PG I) buildings<sup>^</sup>.</p> <p><i><sup>^</sup> PG I buildings refer to residential dwelling houses such as bungalows, detached house, semi-detached houses, and terrace houses.</i></p>
16	A participant sought clarification on the checks required by BCA on the fire lift switch or evacuation switch across the lifecycle of a	Checks on fire lift switches are covered under required for the application and annual renewal of Fire Certificate. Please refer to SCDF's webpage at: <a href="https://www.scdf.gov.sg/docs/default-source/scdf-library/fssd-">https://www.scdf.gov.sg/docs/default-source/scdf-library/fssd-</a>

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	fire/evacuation lift, and whether BCA's inspection form can be updated to include such checks.	<p><a href="https://www.bca.gov.au/downloads/checklist-for-fire-protection-systems-and-fire-safety-measures.doc?sfvrsn=65e1afb0_0">downloads/checklist-for-fire-protection-systems-and-fire-safety-measures.doc?sfvrsn=65e1afb0_0</a>.</p> <p>BCA will also explore the feasibility with SCDF on the suggestion.</p>
17	A participant sought clarification on BCA's position on the display of an expired Permit-To-Operate (PTO).	<p>Lift and escalator owners are reminded of their duty to display a valid PTO in a prominent manner and in a conspicuous position at all times under the Building Maintenance and Strata Management (Lift, Escalator and Building Maintenance) Regulations 2016. This allows users of lifts and escalators to identify unauthorised lifts operating without a valid PTO.</p> <p>The new PTOs issued via the Lifts and Escalators Application Portal (LEAP) will no longer indicate an expiry date, so owners will only need to renew their PTOs annually but no longer need to replace the PTOs with a new one. This will help to owners in the resources required to for the replacement of PTOs annually.</p>
18	A participant sought clarification on the definition of "aging" in the context of conditional assessment.	<p>Ageing lifts typically refer to lifts that are 15 years and older and have not undergone modernisation. For these lifts, conditional assessments should minimally cover safety-critical components such as brake, traction motor, car door control, landing doors and controller.</p>

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		<p>For more information, please refer to BCA's guide on implementing MCP for lifts at: <a href="https://www1.bca.gov.sg/docs/default-source/docs-corp-regulatory/lift-escalators-e-guide/bca-mcp-guide.pdf?sfvrsn=6b79469b_0">https://www1.bca.gov.sg/docs/default-source/docs-corp-regulatory/lift-escalators-e-guide/bca-mcp-guide.pdf?sfvrsn=6b79469b_0</a>.</p>
19	<p>A participant suggested BCA to consider updating the current inspection checklist for lifts to include suspension traction belts which are increasingly common.</p>	<p>BCA noted this feedback and will take this into consideration in future reviews of the inspection checklist.</p>