

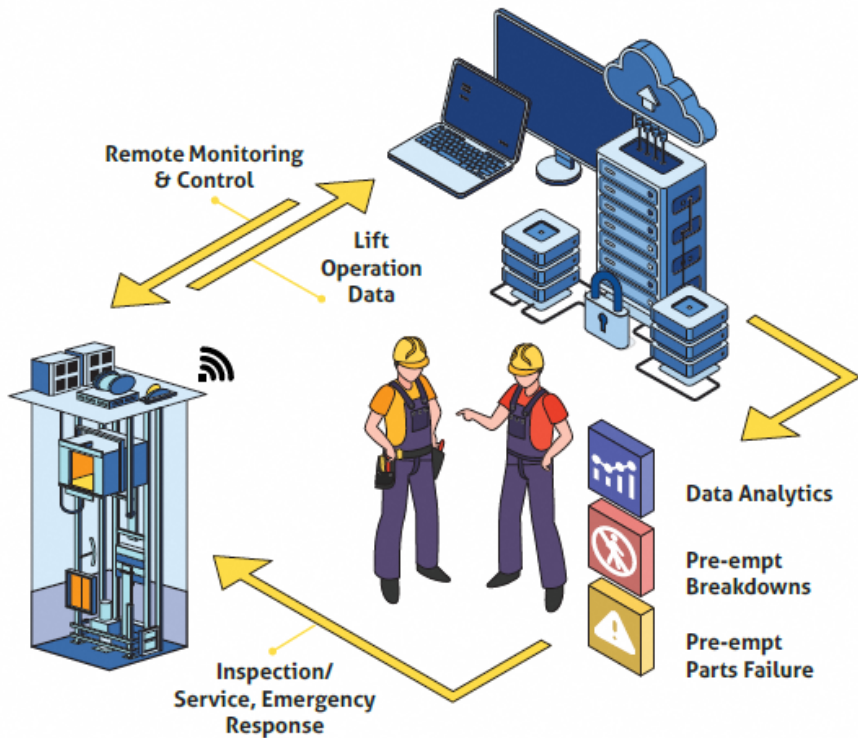
Remote Monitoring and Diagnostics (RM&D) and Outcome- Based Contracting (OBC) for Lifts

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Driving the Adoption of Remote Monitoring & Diagnostics – A Recap



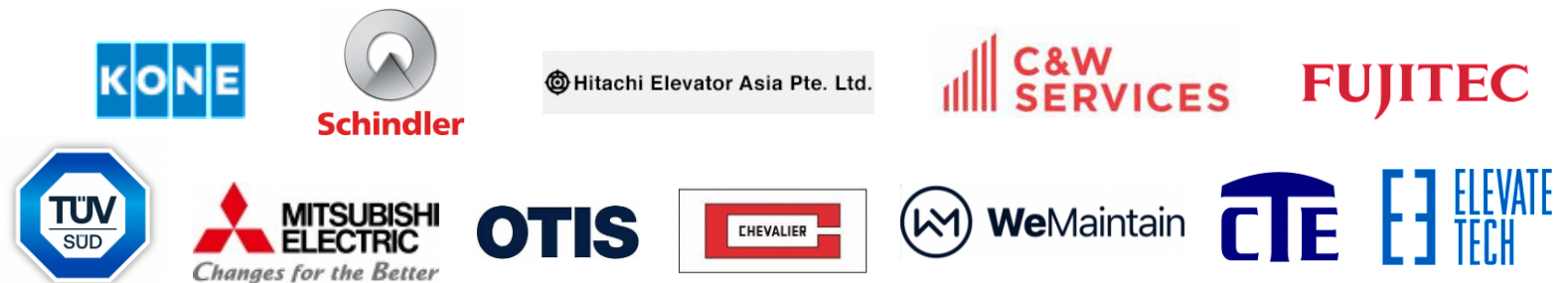
- Technology as a key enabler to raise workforce resiliency and competency
- Besides productivity savings, enables predictive maintenance which improves reliability and uptime
- To support the implementation of RM&D, the Code of Practice and Alternative Maintenance Regime under RM&D Sandbox launched in Aug 2022

RM&D Sandbox – Alternative Maintenance Regime

Strong interest from building owners and RM&D providers

Contractors and solution providers

Covering 70% of the maintenance market

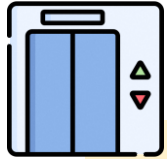


Lift owners



For full list, please refer to: <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>

Value Proposition of RM&D



Lift Safety

24/7 monitoring of safety-critical aspects (and more)

Lift Reliability and Uptime



- Predictive maintenance to pre-empt breakdowns
- Targeted and more efficient rectifications



Asset Management and Planning

Effective life cycle management driven by usage and performance data

Manpower-Lean Maintenance

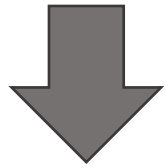


- Maintenance fees more resilient against rising manpower costs
- Cost savings in the long run

With a quarterly maintenance regime, owners and maintenance contractors will be better able to maximise the benefits of what RM&D can provide

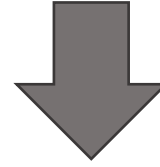
Supporting Stakeholders on RM&D Growth in Singapore

Accelerating the adoption of RM&D in Singapore to enable greater efficiency and productivity and develop a skilled local workforce



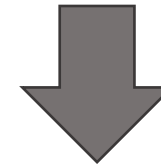
Building up local RM&D Ecosystem

Supporting more solution providers through trials and sandbox

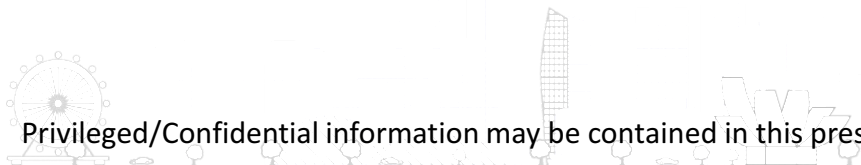


Building up the RM&D Community of Practice

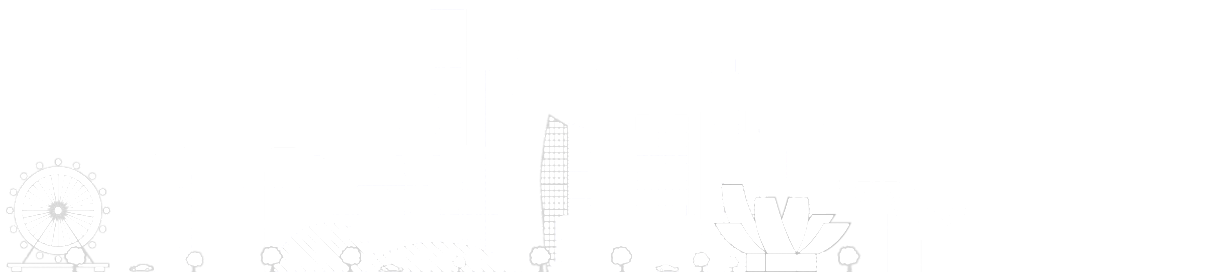
Industry co-sharing of users experience and benefits with case studies and statistics



Encourage the shift to **Outcome Based Contracting** to optimise the benefits of RM&D



Outcome-Based Contracting



What is Outcome-Based Contracting?

Service buyers specifying contract requirements in terms of expected performance levels, rather than fixed amounts of resources (e.g. manpower)

- ✓ Pivoting from manpower-reliant and prescriptive requirements
- ✓ Clear communication of expected service standards
- ✓ Incentivises adoption of technology to achieve desired outcomes efficiently

Outcome-Based Contracting for Lift Maintenance Contracts

Service buyers specifying contract requirements in terms of expected performance levels, rather than fixed amounts of resources (e.g. manpower)

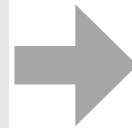


Current



Desired End-State

- **Frequency-based contract** model based on number of visits/callback rates → **Manpower-reliant** and prescriptive
- Lack of incentives for contractors to take **ownership** for **part replacements** and **preventive maintenance** visits
- Does not reward improvements in performance and efficiency using **technology**



- Outcome-based contract model based on **lift performance**
- Clear **set of contract terms** based on **service standards** and **performance** for transparent exchange between stakeholders
- **Collaborative partnership** between owners and contractors (win-win situation)

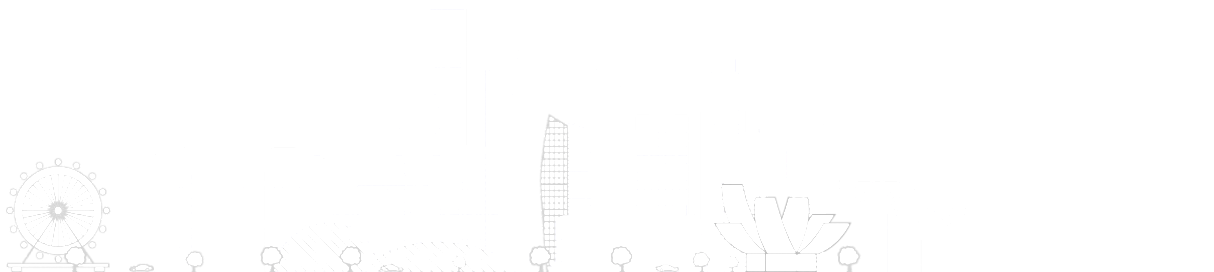
Guide on Specifications for Outcome-Based Lift Maintenance Contracts

- Aimed to guide service buyers and service providers of lift maintenance services in drafting outcome-based tender and contract specifications
- Includes practical examples, clauses, good practices, and tips that can be included in tender requirements
- Includes case study by JTC on their experience incorporating performance management for RM&D lifts



Link: <https://www1.bca.gov.sg/regulatory-info/lifts-escalators/outcome-based-contracting-for-lift-maintenance-contracts>

Key Features of OBC Guide



OBC Core Principles

Desired Outcomes & Outcome-Based Statements

- **Clearly defined performance standard and scope of services**
- **Service providers accorded flexibility to propose alternative solutions that drive same desired outcome**

Performance Evaluation Framework

- **Quality of work assessed with a performance evaluation framework driven by outcomes**

Performance-Based Payment Model

- **Performance-based payments based on KPI score attained**
- **Drives service providers to improve service quality and consistency**

Pre-Tender Stage

Recommended: Contract durations of at least 3+3 years

- Accommodate gradual deployment and **realisation of technological benefits**
- Enable economies of scale
- Longer **cost recovery periods**

Recommended: Adaptive pricing clauses

- **Provisions for contract price review** and adjustments should be included
- **Manpower savings from RM&D can be co-shared** between service buyer and service provider

Performance Evaluation Framework: Example

Desired Outcome

Minimum disruption to lift operations in the building

Outcome-Based Statement

Ensure that regular maintenance is performed to minimise downtime, breakdown, or unexpected failure

Key Performance Indicator (KPI) and target

Availability of the lift per month

KPI target & scoring

Not more than 1 hour of downtime per lift per month

$$\frac{\text{Total downtime across all lifts in portfolio}}{\text{Total no. of lifts in portfolio}}$$

KPI target	KPI scoring
Not more than 1	Below 0.8 – 5 points
hour of downtime	0.8 to <1.4 – 3 points
per lift per month	1.4 and above – 1 point



Performance-Based Payment Model

- **Avoid implementing deductions greater than 10%** of the predetermined base fee to not impact the service provider's **operational viability**
- **Additional bonuses for consistency** (e.g. exceeding KPI target for 3 months in a row) may also be included to reward high-performing service providers

Examples of performance-based payment models:

KPI score attained (out of 4x5=20 points)	Payment received by service provider
$x \geq 19$	Base fee + 10%
$17 \leq x < 19$	Base fee + y% (up to 10%)
$15 \leq x < 17$ (Baseline)	Base fee
$11 \leq x < 15$	Base fee - y% (up to -10%)
$x \leq 11$ (Service failure)	Base fee - 10%

KPI target	Actual performance	Payment
Target 1	Exceed KPI Target	Base fee + y%
	Meet KPI Target	Base fee
	Do not meet KPI Target	Base fee - y%
Target 2	Exceed KPI Target	Base fee + y%
	Meet KPI Target	Base fee
	Do not meet KPI Target	Base fee - y%

Case Study by JTC: Adopting OBC with RM&D

- Pre-tender considerations
- Performance evaluation model
- Performance-based payment model
- Benefits of RM&D adoption in tandem with OBC



Key takeaways

- To realise the full benefits from RM&D adoption, all parties should take a long-term view and pivot from current maintenance practices
- As with any transformation, changes to operational processes and contract models necessary and important for the leap in benefits
- For queries or clarifications regarding RM&D or OBC, you may contact BCA at fu_yixuan@bca.gov.sg or chee_yao_hui@bca.gov.sg



Resources

**RM&D Code of Practice,
Guidelines, Application Forms**

<https://www1.bca.gov.sg/regulatory-info/lifts-escalators/remote-monitoring-diagnostics-for-lifts-in-singapore>

**List of solution providers on
RM&D trials and sandbox**

<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>

**Guide on Specifications for
Outcome-Based Lift
Maintenance Contracts**

<https://www1.bca.gov.sg/regulatory-info/lifts-escalators/outcome-based-contracting-for-lift-maintenance-contracts>

**Guide on FM Procurement (by
FMIC Procurement Taskforce)**

<https://www1.bca.gov.sg/docs/default-source/docs-corp-buildsg/facilities-management/guide-on-fm-procurement.pdf>

Thank You

