



# JTC's Adoption of RM&D Technology and Quarterly Lift Maint.



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16 Jan 2024

# Agenda



**1. Objective**

**2. Background – JTC Lift's RM&D Journey**

**3. Quarterly Lift Maintenance Contract with RM&D**



# 1. OBJECTIVE

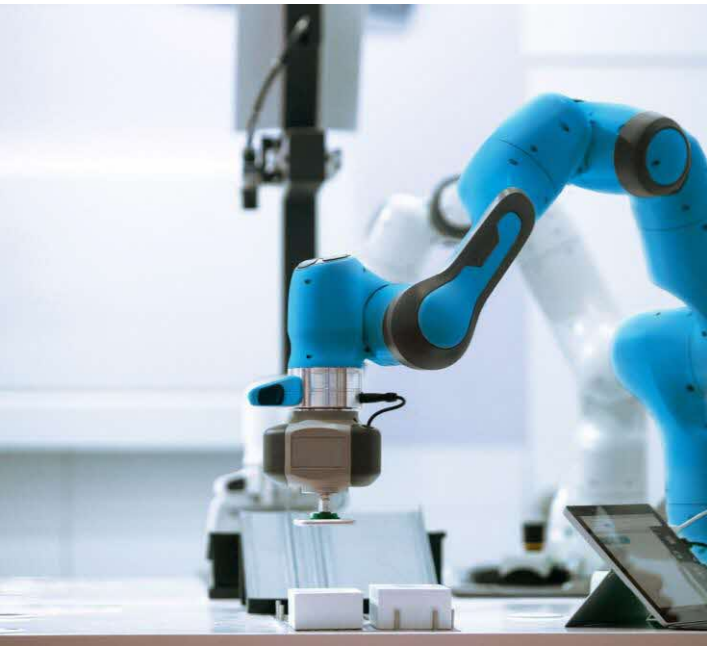
# 1. Objective

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**To transit from traditional monthly lift maintenance contract towards RM&D based and quarterly lift maintenance contract.**

**Goal to transit for the all contract renewals (next 3 years).**



## 2. BACKGROUND

# 2. Background – JTC’s Lifts RM&D Journey



## 2.1 2017–20 : Grant Call and POC for Remote Monitoring and Diagnostic (RM&D)



### 2.1.1. Market Sensing

- Understand available technology and players (1<sup>st</sup> party and 3<sup>rd</sup> party system)
- Understand concerns and challenges (performance, cost and compliances)

Shifting of focus to RM&D for lifts at JTC



### 2.1.2. Innovation Grant Call

- Collaboration between JTC/BCA
- 5 OEM’s lifts (117 lifts)
- POC the technology and enhance its performance to a level that JTC can adopt



### 2.1.3. Partners who came-forth

- KONE (OEM embedded system)
- Schindler (OEM embedded system)
- Tuv Sud (3<sup>rd</sup> party non-intrusive)

## 2. Background – JTC’s Lifts RM&D Journey



### 2.2 2019-21 : POC the technology and enhance its performance



#### KONE 24/7 Connected Services

- Approx 18 months (20 Lifts)
- Cloud-Based Analytics
- System Accuracy 66% to 90%
- Productivity Gain 20% to 25%



#### Schindler Ahead

- Approx 18 months (37 Lifts)
- Cloud-Based Analytics
- System Accuracy 60% to 90%
- Productivity Gain 20% to 25%



#### Lift Manager

- Approx 30 months (117 Lifts)
- Cloud-Based Analytics
- System Accuracy <50% to 80%
- Productivity Gain 20% to 25%

## 2. Background – JTC’s Lifts RM&D Journey



### 2.3 2022-23 : Operationalize the 3 Lift Remote Monitoring and Diagnostic (RM&D)



#### KONE 24/7 Connected Services



- 52 Lifts re-contracted in Oct 2022
- Quarterly Maintenance (BCA Approval Process)
- Contract specifications
  - Breakdown rate from 0.2 to 0.1
  - Performance is 0.07 /lift/mth



#### Schindler Ahead



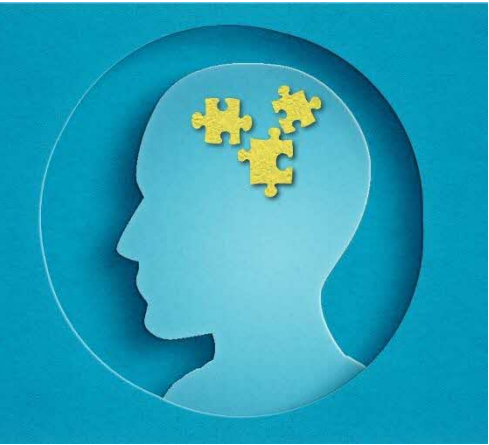
- 53 Lifts re-contracted in Oct 2022
- Quarterly Maintenance (BCA Approval Process)
- Contract specifications
  - Breakdown rate from 0.2 to 0.1
  - Performance is 0.08 /lift/mth



#### Sensor and Data Analytics



- 180 lifts across 4 OEMs (w/o RM&D soln) contract in Apr 2022
- JTC has to get both Tuv Sud and OEMs to commercially agree partnering each other
- BCA Approval Process recently granted.



### **3. Quarterly Maintenance Contract with RM&D**

# 3. Quarterly Maintenance Contract with RM&D



## 1. Derive Maintenance Base Cost using accurate data from RM&D system

- Tracking past labor hours for maintenance, interventions, callbacks etc. using RM&D
- Comparing existing maintenance contract cost to new maintenance contract cost (with RM&D) to derive Productivity Gain
- Transparency of information between service buyers and OEMs

## 2. Incentive Model to co-share productivity gain by awarding bonus to OEMs if the following targets are met

- Setting of KPIs from users perspective
- KPIs are tabulated using RM&D system
- Fair and reasonable targets are set to improve OEM's lift performance.

S/N	KPIs
1	Availability
2	Technical Breakdown Rate
3	Mean Time between breakdown
4	Long Restoration
5	Detection Accuracy
6	Diagnostic Accuracy



### 3. Quarterly Maintenance Contract with RM&D – Scope of Services

- Most of the existing specifications and SLAs in the master maintenance contract will remain.
- Table below shows the key changes in scopes due to RM&D

S/N	Proposed Scope	Existing Contract Specs	Revised Contract Specs
1	Maintenance Frequency	Monthly	Quarterly
2	Annual Test	Yes	Yes
3	Response to Mantrap, Breakdown	Included	Included (as per existing SLA)
4	Restoration Time	Included	To be included as part of KPI
5	Callback	No Cap	No Cap
6	Monthly Report	Included	To include RM&D KPIs
7	Interventions	N.A.	No Cap

### 3. Quarterly Maintenance Contract with RM&D – Cost Structure



New RM&D Contract Structure for OEM lifts deployed with OEM RM&D solution

- To carry out interventions as triggered by OEM RM&D
- To collect data and calculate Labour Hours for new contract structure

Average Labour Hours per month	S/N	Factors
Maintenance	1	Labour Cost
Callback	2	Material Cost
Intervention	3	Remote Monitoring Subscription Cost
<b>Total</b>	<b>A = 1 + 2 + 3</b>	<b>Proposed Base Cost</b>
	<b>B</b>	<b>Existing Maintenance Cost</b>
	<b>B - A</b>	<b>Productivity Gain</b>

# 3. Quarterly Maintenance Contract with RM&D – Incentive & KPI



## Incentive Model

- Calculate efficiency gain with the use of RM&D and quarterly maintenance
- Percentage of new monthly maintenance fee will be co-shared with OEM in the form of incentive
- KPI targets to be reviewed annually. Lift Performance Data to be reviewed quarterly with maintenance fee and incentive paid out quarterly

S/N	KPIs	Definition	Remarks
1	Availability	$\frac{[\text{Maximum Running hours} - \text{Total Downtime}]}{\text{Maximum Running Hours}} * 100\%$	<ul style="list-style-type: none"> <li>• Downtime Includes Rough Usage, Maintenance, Pre-emptive Interventions</li> <li>• Exclude - Downtime Annual Shutdown for testing, pre-planned cyclical works eg. rope &amp; sheave, delay due to JTC instructions..etc</li> </ul>
2	Technical Breakdown Rate	$\frac{\text{Total number of technical breakdowns in a month}}{\text{Total number of lifts}}$	<ul style="list-style-type: none"> <li>• Excludes Rough Usage and others</li> </ul>
3	Long Restoration for technical breakdowns	Time taken to restore the lift back to normal operations	<ul style="list-style-type: none"> <li>• Includes weekend and public holidays</li> <li>• For major works, KPI is met as long as within SLA</li> <li>• Restoration time is time between complaint received and time of lift restoration. Excludes time taken due to PO issuance &amp; star rate negotiation (if no IA is given)</li> </ul>
4	Mean Time between breakdown	Number of days between 2 consecutive technical breakdowns of the same lift	<ul style="list-style-type: none"> <li>• Includes breakdown regardless of component</li> <li>• Exclude Rough Usage</li> </ul>
5	Detection Accuracy	$\frac{\text{Number of breakdowns detected by RM\&D system}}{\text{Total number of breakdowns}}$	
6	Diagnostic Accuracy	$\frac{\text{Number of true positive cases}}{\text{Total number of interventions cases}}$	

# 3. Quarterly Maintenance Contract with RM&D – Incentive & KPI



## Incentive PayOff (Sample 20% productivity gain)

- Tier 1 incentive shall be awarded to OEMs if the following targets are met
- Tier 2 shall be awarded to OEMs if following targets are met for 3 consecutive months
- Up to 12% of new monthly maintenance fee

Item	KPI (reviewed monthly)	Current BD Statistics (Ave)	JTC Target	Tier 1 Incentive (up to 6%)	Tier 2 Incentive (up to 6%)
1	<b>Availability</b>	99.51%	99.6%	1% of Monthly Maintenance Fee	Additional 2% of Monthly Maintenance fee if target reached for 3 consecutive months
2	<b>Technical Breakdown Rate</b>	0.083	0.08	1% of Monthly Maintenance Fee	Additional 2% of Monthly Maintenance fee if target reached for 3 consecutive months
3	<b>Percentage of technical breakdowns restored in less than 8 hours*</b>	51%	70%	1% of Monthly Maintenance Fee	Additional 1% of Monthly Maintenance fee if target reached for 3 consecutive months
4	<b>Percentage of lifts with MTBB of &gt;180 days</b>	30/37 (81%)	90%	1% of Monthly Maintenance Fee	Additional 1% of Monthly Maintenance fee if target reached for 3 consecutive months
5	<b>Breakdown Detection Accuracy</b>	95%	95%	1% of Monthly Maintenance Fee	N.A.
6	<b>Diagnostic Accuracy</b>	85%	90%	1% of Monthly Maintenance Fee	N.A.



Thank you

