**Form B – Details of Performance Indicators Values (Past 6 months)**

|  |
| --- |
| Equipment Availability |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Month** |  |  |  |  |  |  |
| Numbers of days in the month  |  |  |  |  |  |  |
| Maximum possible hours per day (hr) |  |  |  |  |  |  |
| Sum of hours on repairs in the month (hr) |  |  |  |  |  |  |
| **Equipment Availability (%)** |  |  |  |  |  |  |

 |
| Faults per Equipment |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Month** |  |  |  |  |  |  |
| Total Number of Faults |  |  |  |  |  |  |
| **Faults per Equipment** |  |  |  |  |  |  |

 |
| Technical Faults per Equipment |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Month** |  |  |  |  |  |  |
| Total Number of Technical Faults |  |  |  |  |  |  |
| **Technical Faults per Equipment** |  |  |  |  |  |  |

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|  |
| --- |
| **First Time Fix Rate**  |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Month** |  |  |  |  |  |  |
| **First Time Fix Rate (%)** |  |  |  |  |  |  |

 |
| **Mean Time To Repair** |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Month** |  |  |  |  |  |  |
| Total Number of Technical Faults |  |  |  |  |  |  |
| Total Downtime of Technical Faults |  |  |  |  |  |  |
| **Mean Time To Repair**  |  |  |  |  |  |  |

 |
| **Prediction Accuracy (%)** |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Month** |  |  |  |  |  |  |
| Number of Cases marked as True (T) |  |  |  |  |  |  |
| Total Number of Intervention Case |  |  |  |  |  |  |
| **Prediction Accuracy (%)** |  |  |  |  |  |  |

 |
| **Device Availability (%)** |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Month** |  |  |  |  |  |  |
| Number of days in months |  |  |  |  |  |  |
| Sum of daily offline units in month |  |  |  |  |  |  |
| Sum of daily online units in month |  |  |  |  |  |  |
| **Device Accuracy (%)** |  |  |  |  |  |  |

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**Explanatory Notes**

1. Below is the list of RM&D indicators:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S/N | Type of Indicators | Abbreviation | Formula | Units |
| 1 | Technical Faults per Equipment | TFPE | $$TFPE= \frac{Total Number of Technical Faults^{NOTE(1)}}{Total Number of Equipment}$$ | Technical Faults per lift per month |
| 2 | Faults per Equipment | FPE | $$FPE= \frac{Total Number of Faults^{NOTE(2)}}{Total Number of Equipment}$$ | Faults per lift per month |
| 3 | First Time Fix Rate | FTTR | $$FTTR^{NOTE(3)}= 1-\frac{Total Number of the Repeated Technical Faults }{Total Number of Technical Faults}$$ | % (per lift per month) |
| 4 | Mean Time To Repair | MTTR | $$MTTR^{NOTE(4)}= \frac{Total Downtime of Technical Faults^{NOTE(5)}}{Total Number of Technical Faults}$$ | Hours/failure (per lift per month) |
| 5 | Average Monthly Uptime | UT | $$\frac{Maximum Possible Running Hours^{NOTE\left(6\right)}-Total Downtime of Technical Faults}{Maximum Possible Running Hours}$$ | % (per lift per month) |
| 6 | Diagnostics Accuracy | DiA | $$\frac{Total Number of Intervention Cases marked as True (T)^{NOTE(7)}}{Total Number of Intervention Cases^{NOTE(8)}}$$ | % (per month) |
| 7 | RM&D Device Availability | DA | $$\frac{Total number of RM\&D units that are online}{Total number of RM\&D units}$$ | % (per lift per month) |

*NOTE (1) A list of technical faults is given in Explanatory Note (2).*

*NOTE (2) Faults is sum of technical faults and non-technical faults. A list of non-technical faults is given in Explanatory Note (2).*

*NOTE (3) Technical faults that happen within the next 30 days after they have been rectified are to be considered for the calculations.*

*NOTE (4) MTTR exclude the following: (1) major repair/overhaul that takes more than 1 day (refer to the list of exclusion cases below for more details); (2) waiting time for spare parts arrival; and (3) additional time needed to do hot-testing.*

*NOTE (5) Total downtime of technical faults is the sum of all time spent to rectify all technical faults in hours.*

*NOTE (6) Maximum possible running hours is the number of days in the month multiplied by 24 hours for each lift.*

*NOTE (7) A True (T) Intervention Case is when the RM&D prediction matches diagnosis/faulty component on site.*

*NOTE (8) Intervention cases are defined as cases prompted by RM&D system whereby a visit to lift by maintenance personnel is required.*

**List of Exclusion Cases**

|  |  |
| --- | --- |
| **S/N** | **Examples of MTTR Exclusion Cases (non-exhaustive)** |
| 1 | Hoisting motor replacement/repair |
| 2 | Ropes replacement |
| 3 | Main/Diverting sheave replacement/repair |
| 4 | Major lift components, e.g. governor, safety gear |
| 5 | Total failure of Frequency Inverter |
| 6 | Water ingress situation |
| 7 | Building power failure |

1. List of Technical Faults and Non-Technical Faults

|  |  |  |
| --- | --- | --- |
| **S/N** | **Technical Faults** | **Non-Technical Faults** |
| 1 | Motor [Thermal/Voltage/Current] | Noise |
| 2 | Machine brake [Brake Switch] | Display Indicators/LCD |
| 3 | Electrical Components [Switches/Contactors/Relays/PCBs] | Faulty buttons [Car/Landing] |
| 4 | Main Drive Unit/Frequency Inverter | Card reader |
| 5 | Landing Doors  | External Element Blocking Doors [Object/Human] |
| 6 | Car Door  | Car Interior [False Ceiling/Cladding] |
| 7 | Buffers  | Fire Homing/Power Failure Mode |
| 8 | Speed Control System [Shaft/Motor Encoder] | Natural Disaster/Incident leading to component failure [Water ingress] |
| 9 | Overspeed Governor & Governor Rope | Oil Pots Leakage |
| 10 | Levelling Accuracy |  |
| 11 | ACOP/UCMP/Rope gripper |
| 12 | Batteries Failure [ARD/EBOPS] |
| 13 | Suspension Ropes [Elongation Switch/Sensor] |
| 14 | Bearings Worn-out |
| 15 | Load Measuring Devices [Overload Signal] |
| 16 | Compensation Devices [Chain/Rope] – [Elongation Switch/Sensor] |