

# Lift Maintenance Control Plan – Guide on Replacement Criteria for Major Parts

Presented by: Er. Wang Yu

Senior Engineer

Electrical and Engineering Group

Building and Construction Authority



# Content

- Maintenance Control Plan (MCP): Objective & Strategies
- MCP Parts Replacement Guide
  - What is it about;
  - Parts covered in the Guide;
  - Condition assessment and two-stage monitoring;
  - Recommended 15<sup>th</sup>-year assessment by SPE.



# Current Problems of Lift Maintenance

1

No standard replacement criteria for parts;

2

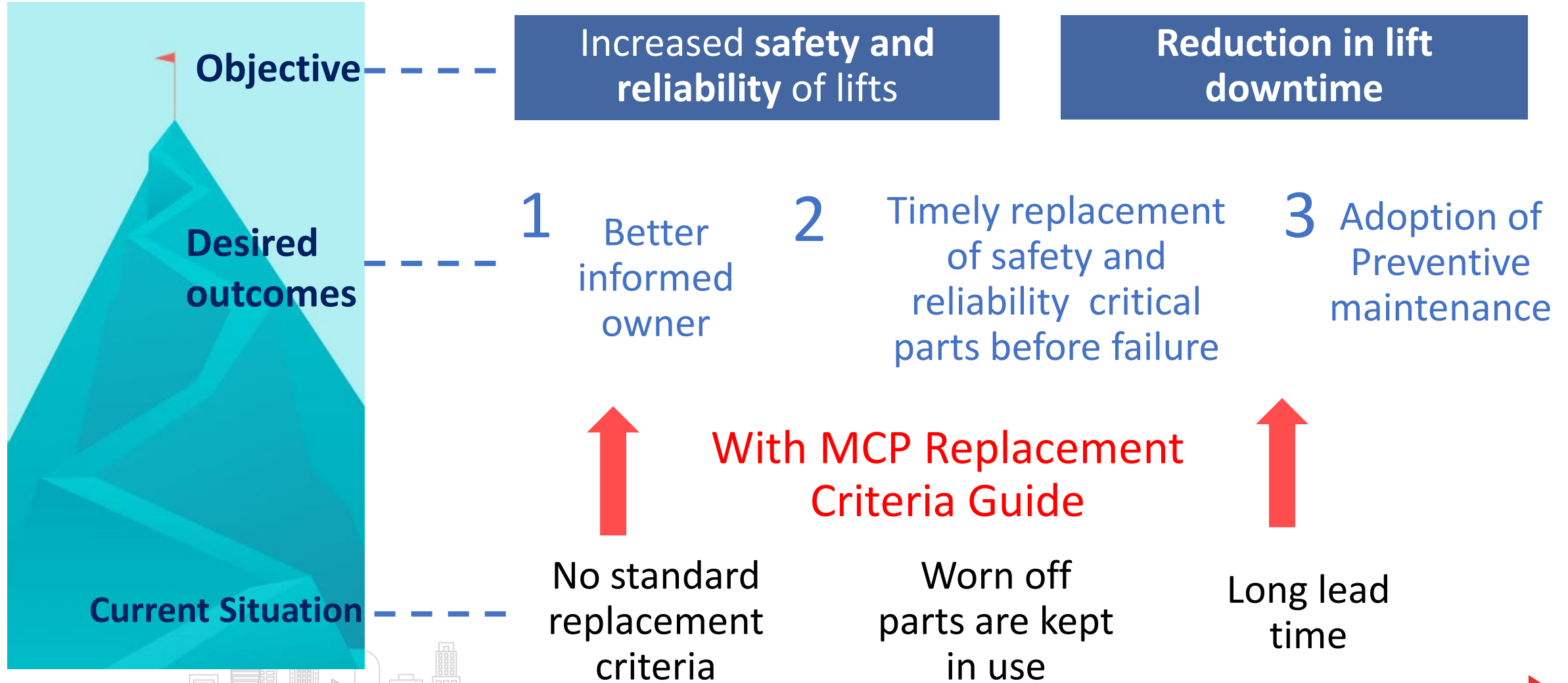
Long lead time for obtaining replacement parts.

3

Worn-off parts are kept in use due to:  
a) lack of planning for budget;  
b) availability of parts locally.

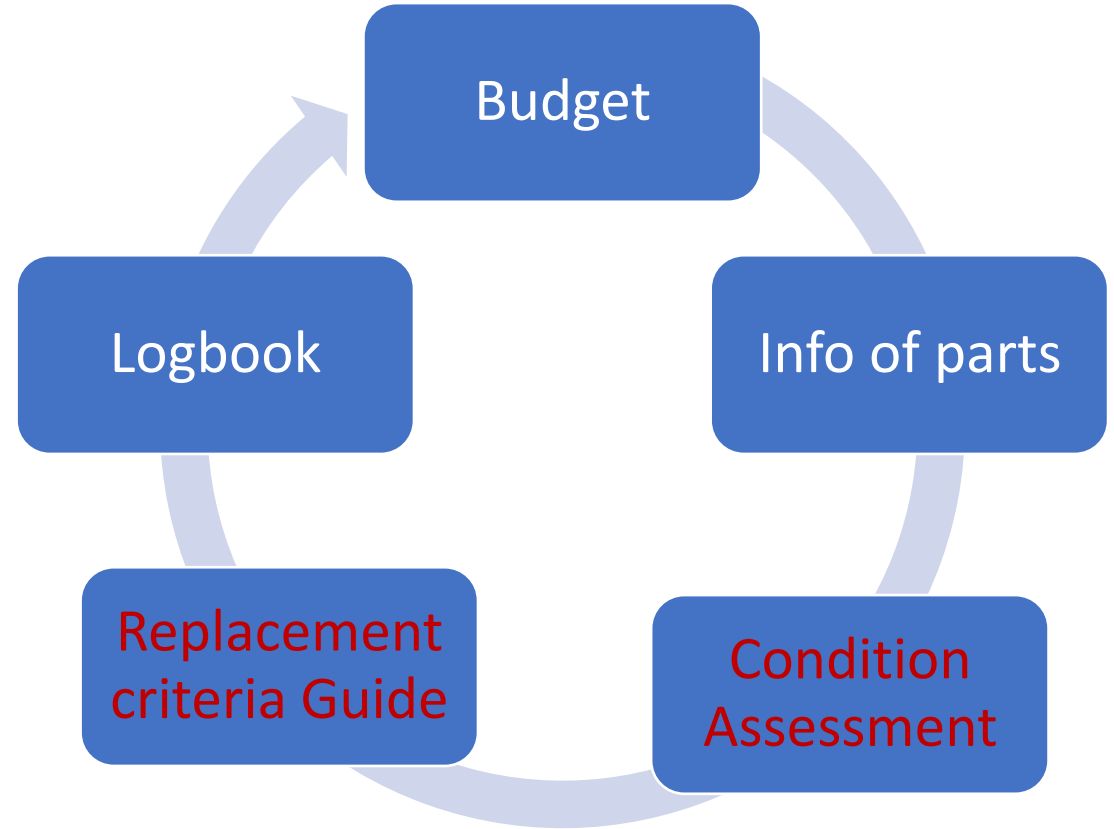


# What do we want to achieve



# What is Maintenance Control Plan (MCP)?

- 1) Life-cycle parts replacement concept
- 2) For use of both owners and contractors to manage parts replacement and obsolescence

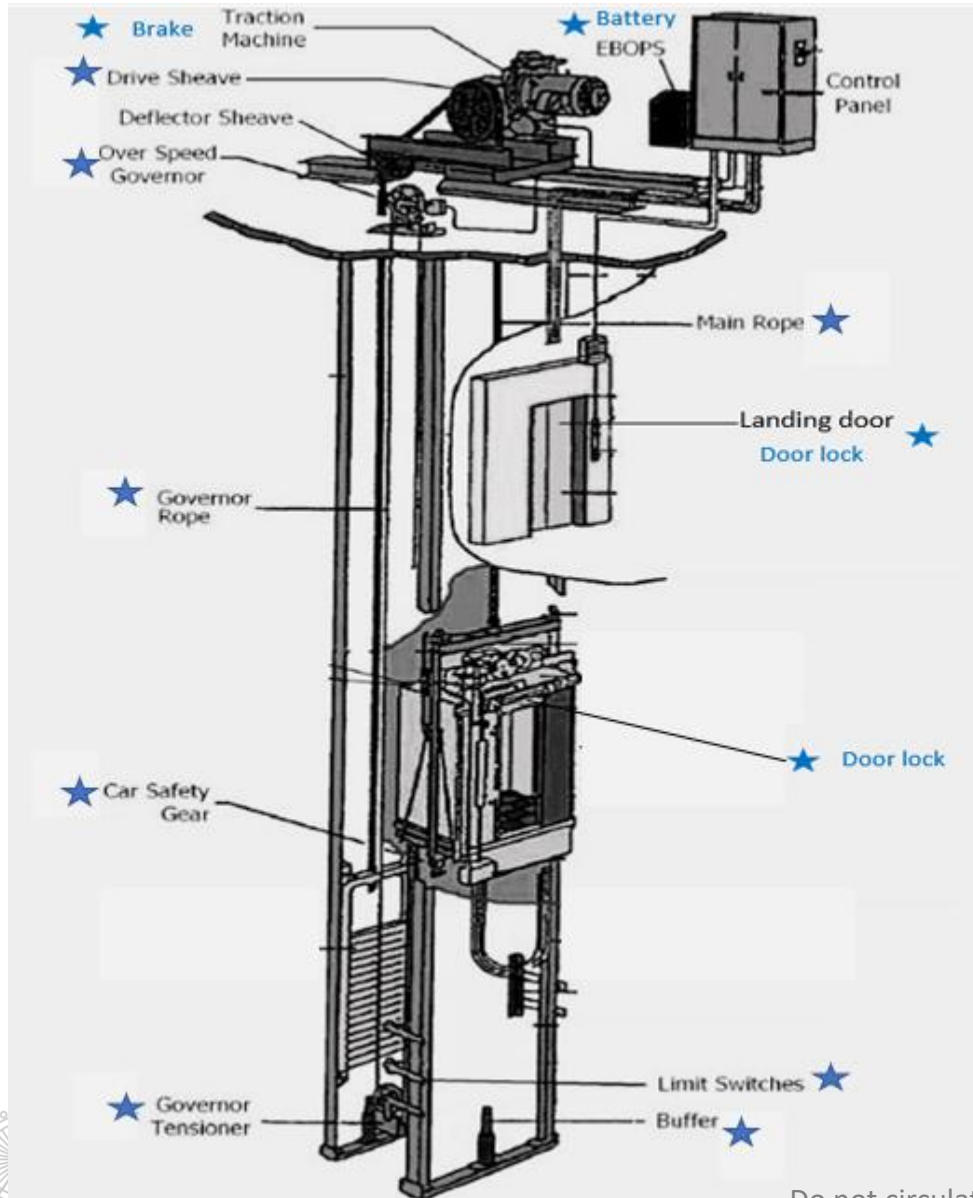


# MCP Parts Replacement Criteria Guide

- Preventive Maintenance Approach
- Made reference to [GBT-31821\(2015\)](#) discard criteria for lift major parts in China and Lift Modernisation Design Guide
- Only the safety and reliability critical parts are included
- Concept of [two stage monitoring](#) (to be elaborated in slide later)
- Owner to plan and budget maintenance from a **long-term** prospective



# Parts Covered in the Guide



Parts are divided into two main categories, **Mechanical** and **Electrical** parts.

## Mechanical Parts:

1. Brake Pad;
2. Ropes;
3. Sheave;
4. Safety Gear and Governor;
5. Buffer (Spring/Hydraulic/PU buffer);
6. Landing door and car door locks;

## Electrical Parts:

1. UPS batteries;
2. Electrical switches/sensors used in safety circuits.

★ Parts included in the Guide

Do not circulate to external parties without BCA's prior consent

# MCP Parts Replacement Criteria Guide

Only the safety and reliability critical parts are included

For example, for traction system

- Brake, Pulley and Ropes are included
- Other parts such as the main body of the traction machine are seldom replaced and thus not included





# What Is Parts Replacement Criteria Guide

Provide guidance to owners & contractors on **replacement criteria of safety and reliability critical parts** before failure happens

Criteria for  
Replacement

Criteria to start preparation, source parts and schedule for replacement  
(1<sup>st</sup> Stage, Hi alarm)

Criteria for immediate replacement  
(2<sup>nd</sup> Stage, Hi-Hi alarm)



# Replacement Criteria - Two Stage Monitoring

## Example - Brake pad

Allowable thickness	Actual thickness measured	Date
-Original new pad thickness: 7mm Criteria to start planning and arranging for replacement at 5.5mm (Hi alarm)	Left Pad: 5.5mm Right Pad: 5.7mm	1 June 2021 (parts sourced and quotation sent to owner, owner prepare funds)
-Immediate Replacement criteria: 5mm (HiHi alarm)	Left Pad: 5mm Right Pad: 5.3mm	30 Nov 2021 (Replacement scheduled on 1 Dec)

To be filled up by installation contractor, and to be used by the maintenance contractor to do the monitoring and condition assessment

To be measured and recorded by Maintenance contractor, and kept in the logbook



# Replacement Criteria - Two Stage Monitoring

## Example – Ropes (nominal diameter 12mm)

Allowable Diameters as per code or as per manufacturer's recommendation	Actual diameter measured	Date
-Criteria to start planning and arranging for replacement at 4% reduction in diameter <b>(Hi alarm)</b>	11.5mm, i.e., 4% reduction	1 Jan 2021
-Immediate Replacement criteria: reaching 6% diameter reduction <b>(HiHi alarm)</b>	11.2mm, i.e. 6% reduction	30 Nov 2021

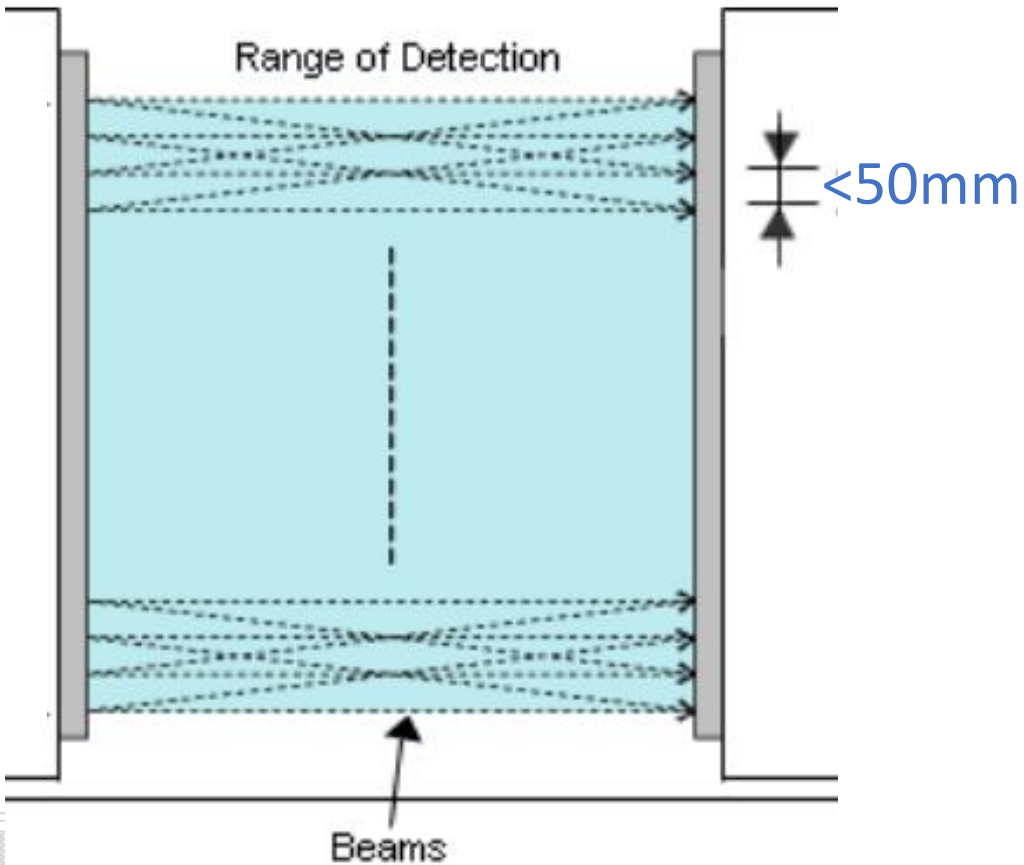
To be filled up by installation contractor, and to be used by the maintenance contractor to do the monitoring and condition assessment

To be measured and recorded by Maintenance contractor, and kept in the logbook



# Replacement Criteria – Non-measurable Parts

## Example -Car door multi-beam sensor



### Replacement criteria:

Number of defective emitter/ detector increases which causes a blind spot that the protective device is not capable of detecting obstacles of minimum 50 mm diameter.

# Recommended SPE's 15th-year Assessment

- It is recommended that:
  - a) Owner to engage contractor to carry out assessment of the **electrical/electronics parts 10 years** after the installation of the lifts, and
  - b) Owner to appoint an SPE to conduct an independent comprehensive assessment of **the lift 15 years** after the installation;
- Owner can have such assessment earlier as
  - a) the lift and its parts can be affected by other factors including the usage of the lift, and
  - b) owner's requirement of the reliability of the lift can be different



# Thank you



@BCASingapore

