



Use of Lift for Evacuation of Building Occupants

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Objective of Presentation

To highlight the key provisions on the use of lifts for evacuation of building occupants during a fire emergency.



Scope of Presentation

- Introduction
- Current evacuation strategy
- New lift design requirements & evacuation strategy
- Application of Design Requirements
- Public Education
- Implementation of requirements



Introduction

■ Established Practice

- Exit staircases are used for evacuating building occupants

■ Prohibition on the use of lift

- Passengers trapped in lift due to failure of lift component or power failure
- Possibility of smoke infiltrating the lift car and lift shaft
- Possibility of fire affecting the lift cables

■ Review of established practice

- Event of 11 September 2001
- Improved lift technology
- Demographic changes
- Drawbacks in the use of exit stairs

Drawbacks in the use of exit stairs

- **Vertical fatigue**
- **Physical limitations**
- **Overcrowding in stairs**
- **Longer time to reach the ground level**



Current Evacuation Strategy

- Evacuation via staircase
- Phased evacuation for tall buildings
- Occupants on the fire floor, two floors above the fire floor and two floors below the fire floor are evacuated first before occupants from the other floors are evacuated.
- Total building evacuation strategy if the entire building is under threat.

Current Evacuation Strategy

Operation of Fire Lift and Passenger Lifts in an emergency:

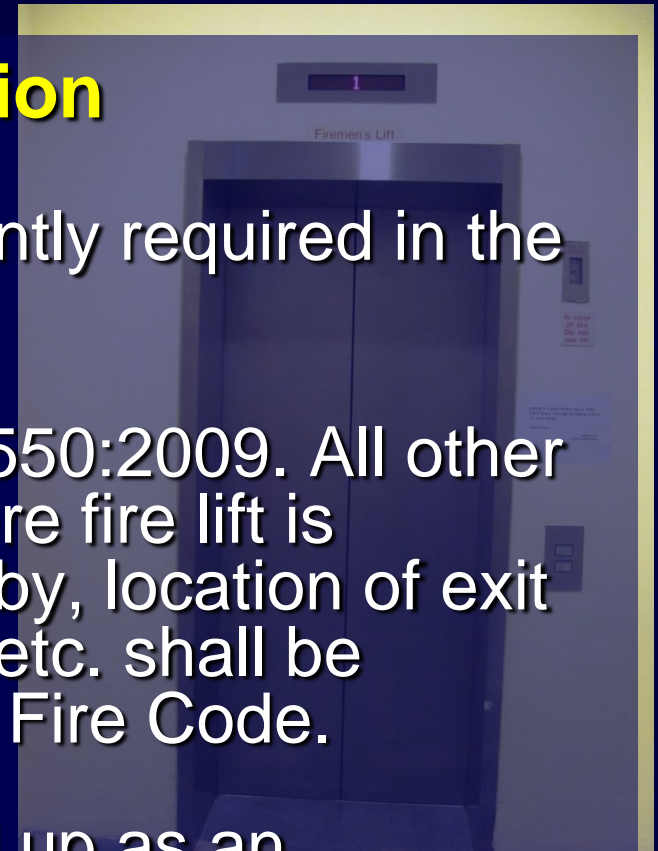
- Passenger lifts and fire lift will be returned to the designated floor (usually ground floor).
- For passenger lifts in residential buildings below 60m that are without generator, these are connected to Automatic Rescue Device (ARD) and brought to the nearest floor, instead of the ground floor in the event of power failure.
- Only fire lift can be manually operated by the fire-fighters via the fireman switch.
- The capacity of emergency power supply is usually only adequate to operate the fire lift during power failure mode.



New Lift Design Requirements

■ Fire lift to be used for evacuation

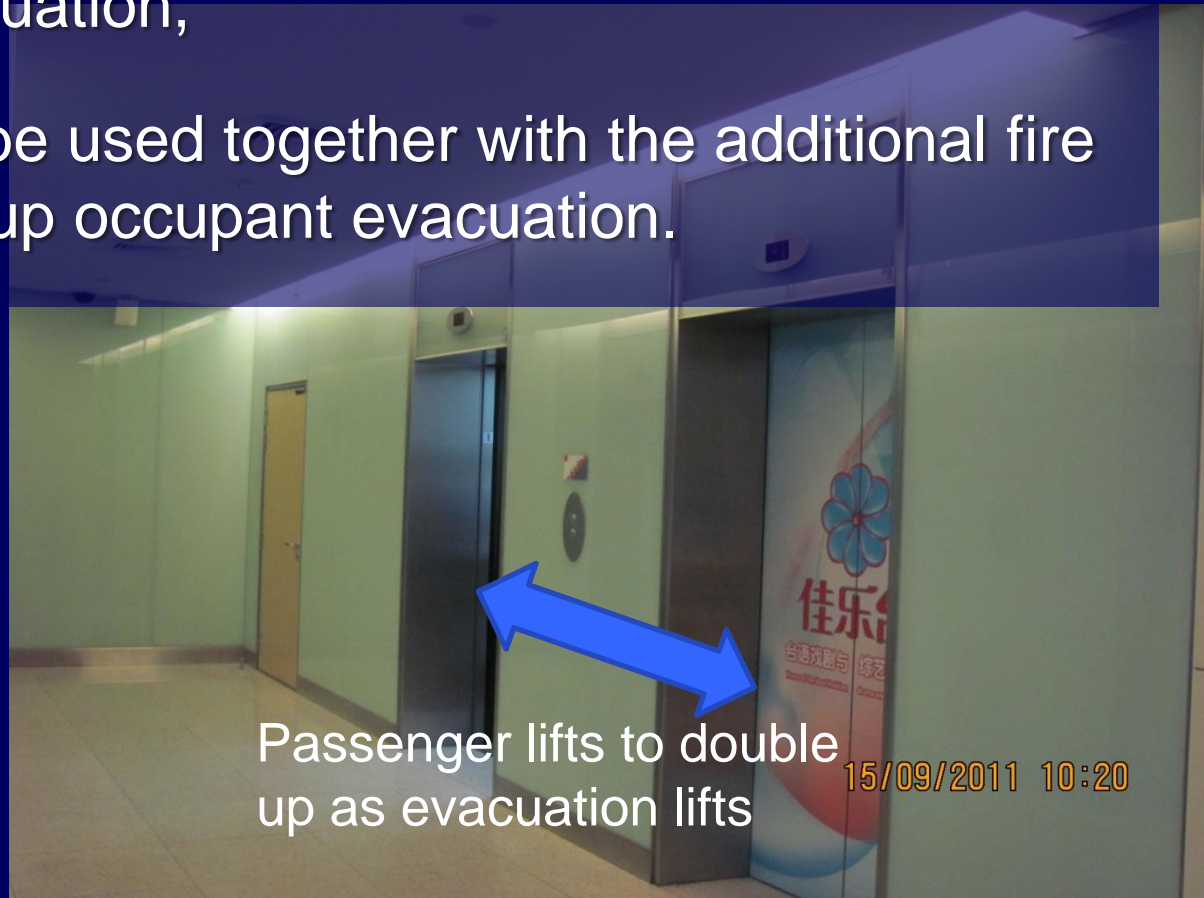
- An additional fire lift to that currently required in the Fire Code .
- Installation accordance with SS 550:2009. All other related fire safety measures where fire lift is provided such as fire fighting lobby, location of exit staircase adjacent to the fire lift, etc. shall be designed in accordance with the Fire Code.
- Additional fire lift can be doubled up as an evacuation lift for persons with disabilities (PWDs) i.e. evacuation lift for PWDs need not be separately provided. Minimum platform area of fire lift shall be 1.2m by 1.4m (i.e. 1.68m²) for evacuation of PWDs.



New Lift Design Requirements

■ Use of passenger lifts for evacuation

- Improvement to the rate of evacuation is marginal as fire lift is used for evacuation,
- Passenger lifts to be used together with the additional fire lift so as to speed up occupant evacuation.



New Lift Design Requirements

■ Use of passenger lifts for evacuation

- Fire lift switch to be provided to all passenger lifts . Where there is provision to manually override the passenger lifts at the FCC by authorized personnel or fire-fighters, fire lift switch need not be separated installed at lift lobby.
- Close circuit television at lift lobbies



↑
Fire lift switch

New Lift Design Requirements

■ Communications

- An intercom system in the lift car for communication between the lift operator and the FCC.
- A lift monitoring system within the Fire Command Centre (FCC).
- Voice communication system.



New Lift Design Requirements

■ Communications

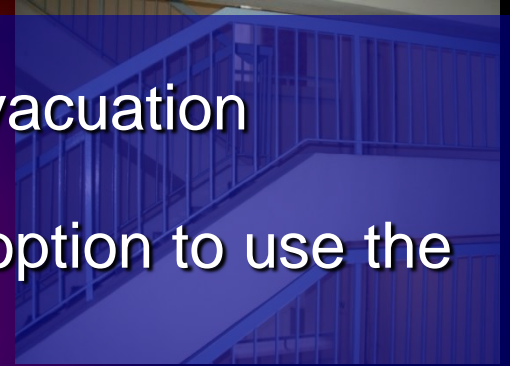
- CCTV at lift lobbies to facilitate situation awareness for authorized personnel.

Alternatively, a distress button or voice communication between the lobby and FCC, for persons requiring assistance to call for assistance during a fire emergency.



New Lift Evacuation Strategy

- Occupants use the exit staircases for evacuation
- Fire-fighters/CERT have the additional option to use the lift for evacuation.
- Evacuation via lift conducted under the supervision of fire-fighters/CERT.
- SCDF take over the supervision of the evacuation.



Application of Design Requirements

- **Use of passenger lifts for evacuation in new and existing buildings**
- The following are existing requirements in relation to lifts
 - Protective enclosure to lift except for bubble lift (already a requirement in Fire Code)
 - FCC (already a requirement in Fire Code)
 - Voice communication system (already a requirement in Fire Code)
 - Power cables which are routed through an area of negligible fire risk (already a requirement in Fire Code)

Application of Design Requirements

■ Not applicable to residential buildings

- No provision of FCC and voice communication system
- No designated staff
- Each residential unit is a fire compartment.



Public Education

- Public is entrenched with the mindset against the use of lifts for evacuation
- Additional option to evacuate via lift. Only to be undertaken under supervision of fire-fighters/mandatory or volunteer CERT registered with SCDF.
- The message of not using lift for evacuation during a fire emergency remains unchanged.

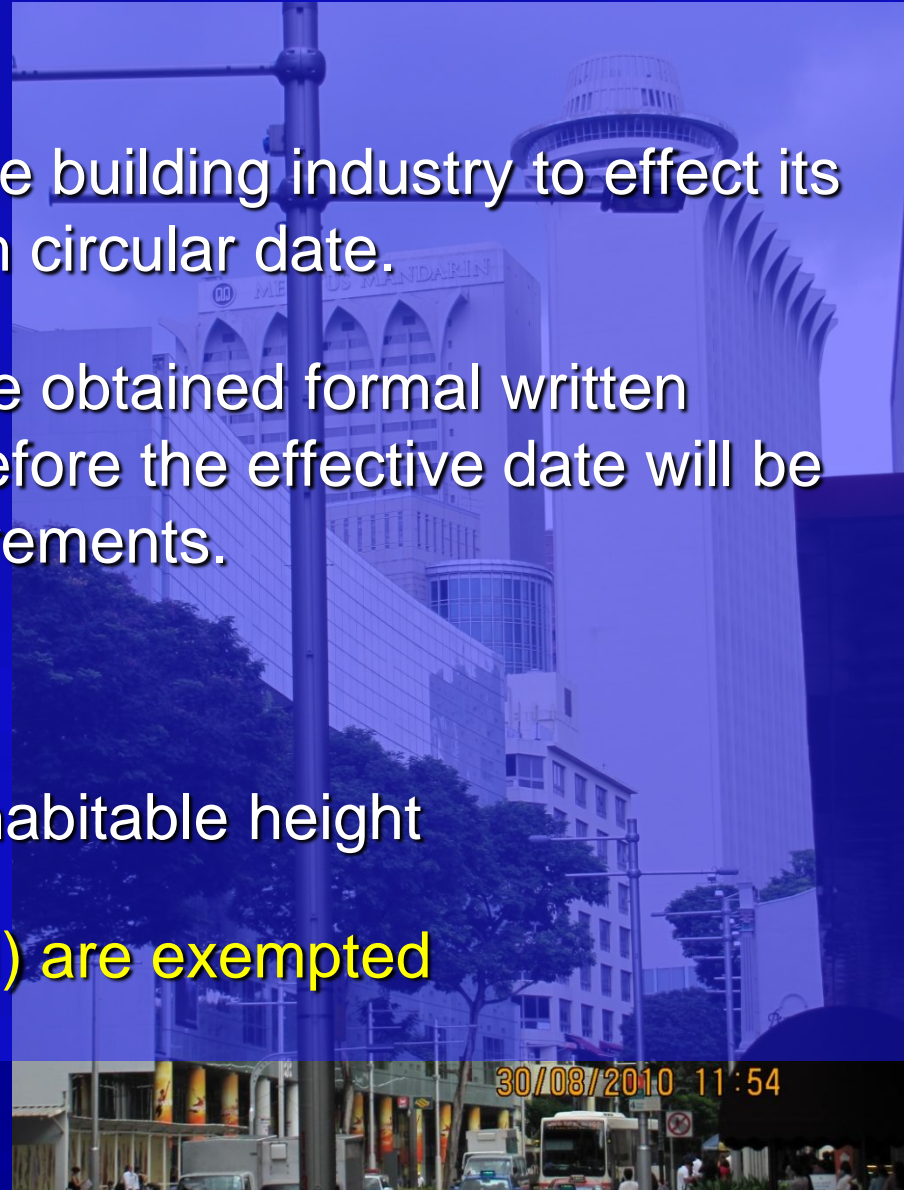
A photograph of a staircase with a sign on the wall. The sign is white with red text. The background is a blue-tinted image of a staircase with metal railings.

In case
of fire
Do not
use lift

Implementation

■ New Buildings

- Circular has been issued to the building industry to effect its implementation 9 months from circular date.
- Any building projects that have obtained formal written permission from URA on or before the effective date will be exempted from the new requirements.
- Effective date 27 Dec 2011
- New buildings above 24m in habitable height
- **Residential buildings (PGI & II) are exempted**



Implementation

■ Existing Buildings

- Existing building owners are encouraged to carry out the minor retrofitting works so that passenger lifts can be used for evacuation.
- The implementation of the design requirements will only be effected when there is a major retrofitting carried out in commercial & industrial buildings.
- Change of use involves more than 1 storey
- A/A works more than 200sqm or constitutes more than 50% of the total area of the affected floor
- Make reference to circular dated 5 Feb 2010



THANK YOU