

# Fire Safety in Private Healthcare Facilities



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# Overview

- ▶ Risk Assessment
- ▶ Firefighters' Challenges
- ▶ Mitigation Measures
- ▶ Statutory Requirements

# Risk Assessment - Siting Concerns

| Factor | Nature  |
|--------|---|
| Siting | <ul style="list-style-type: none"><li>• On-site Assessment</li><li>• Accessibility of FS appliances</li><li>• Water supplies</li><li>• Co-existence</li></ul> |

# Risk Assessment - Siting Concerns

| Factor | Nature  |
|--------|---|
| Siting | <ul style="list-style-type: none"><li>• Provision of lift</li><li>• Width of staircase</li><li>• Emergency patient transfer</li></ul> |

| Stretcher   | Width  |
|---|--|
| <ul style="list-style-type: none"><li>• Stryker MX-PRO</li><li>• Stryker MX-PRO Bariatric</li><li>• Stryker Power Pro</li></ul> | <ul style="list-style-type: none"><li>• 58cm</li><li>• 74cm</li><li>• 58cm</li></ul> |

# Risk Assessment - Fire

*Risk - the likelihood that a person may be harmed or suffer adverse effects if exposed to a hazard*

| Anticipated risk | Risk nature  |
|------------------|--|
| Fire risk        | <ul style="list-style-type: none"><li>• <b>Ignition sources:</b> naked flames, faulty or misused electrical equipment, cooking equipment, hot surfaces, human factors</li><li>• <b>Fire load:</b> flammable liquids, medical gases, fuel, furniture, mattress, personal effects,</li><li>• <b>Oxygen:</b> oxidizing agents, medical oxygen</li><li>• <b>Nearby units</b></li></ul> |

# Risk Assessment - Life

| Anticipated risk | Risk nature  |
|------------------|--|
| Life risk        | <ul style="list-style-type: none"><li>• Clientele dependency</li><li>• Density</li><li>• Activities: sleeping, medical treatment</li><li>• Human Behaviour</li></ul> |

# Firefighters' Challenges

**Rapid fire growth**

**Heavy fire load**

# Firefighters' Challenges

## Affected by neighboring buildings

# Firefighters' Challenges

## Vulnerable group of people

- ▶ Restricted mobility
- ▶ Under medication
- ▶ Dependent on electrical/mechanical equipment

# Firefighters' Challenges

## Emergency Evacuation

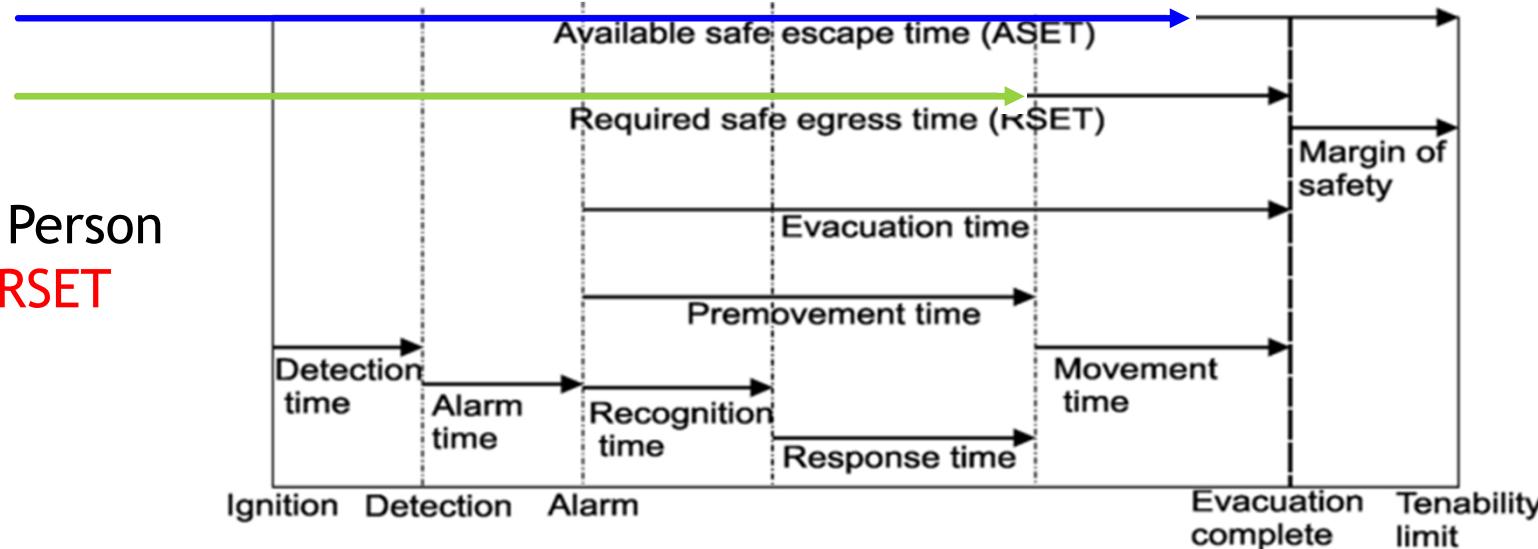
# Firefighters' Challenges

**Massive engagements of logistic support  
and manpower**

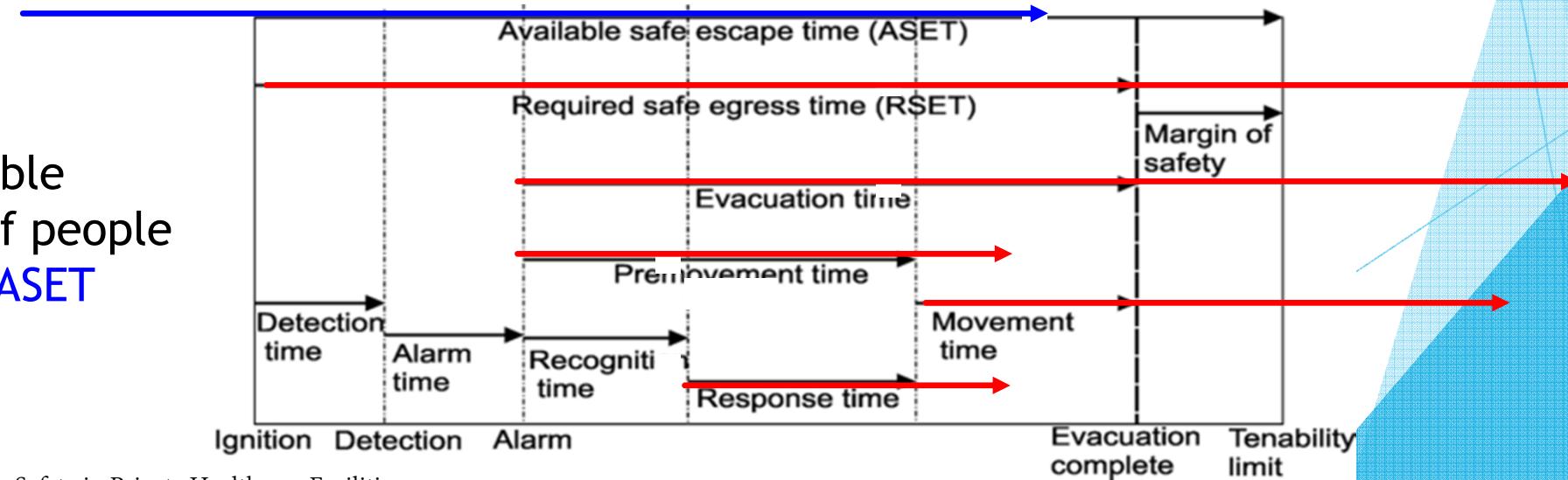
# Firefighters' Challenges

## Evacuation constraints - Human factors

Normal Person  
 ASET > RSET



Vulnerable group of people  
 RSET > ASET



# Firefighters' Challenges

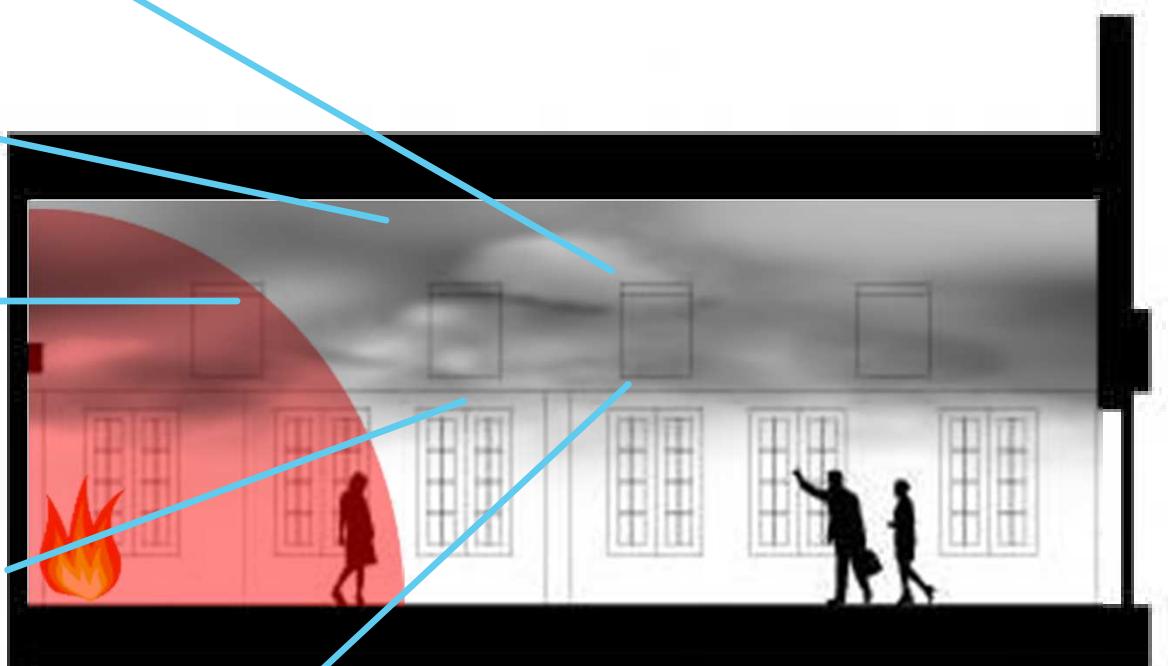
## Evacuation constraints - Tenability limit

Smoke layer height: 2-2.5m

Ambient temperature  $>60^{\circ}\text{C}$

Radiated heat:  $2.5\text{kW/m}^2$

Toxicity:  
CO 6,000ppm  
HCL 500ppm  
HCN 150ppm



Visibility: 10m

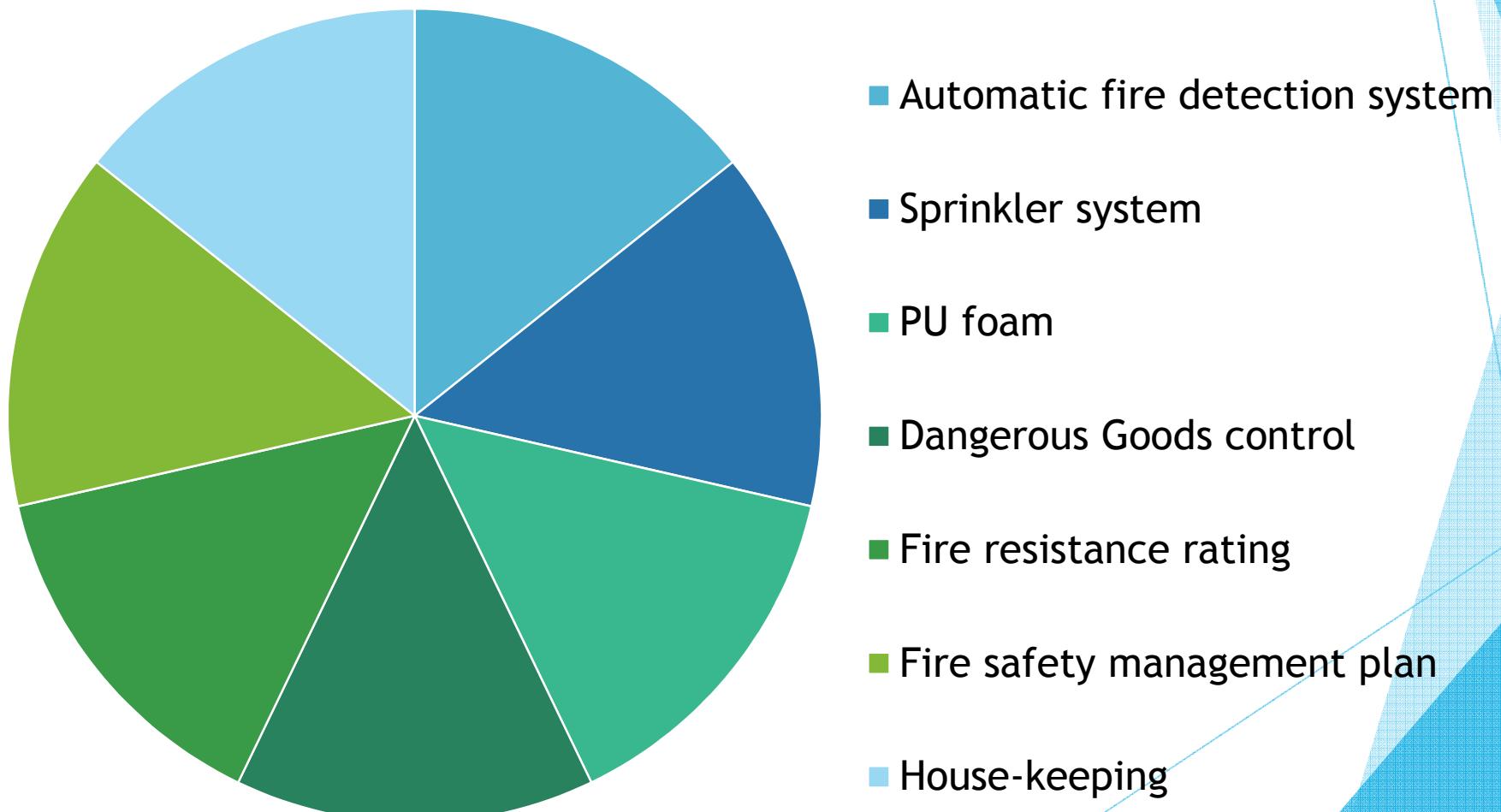
# Mitigation Measures - Siting

## Factors to be considered

|        | <b>Control Measures</b>  |
|--------|--|
| Siting | <ul style="list-style-type: none"><li>• Building design</li><li>• Emergency vehicular access (EVA)</li><li>• Fire fighting water supplies</li><li>• Co-existence with other business</li></ul> |

# Mitigation Measures - Fire Risk

## Preventing, attacking & limiting the fire



# Mitigation Measures - Life Risk

## Facilitate evacuation

| Anticipated risk | Mitigation Measures   |
|------------------|---|
| Life risk        | <ul style="list-style-type: none"><li>• Emergency lighting</li><li>• Exit sign</li><li>• Compartmentation</li><li>• Number of escape routes and exits</li><li>• Evacuation strategy</li></ul> |

# Crucial Risk Mitigation Measures

**Fire Evacuation Strategy - Vulnerable group of people**

**Horizontal evacuation**

To an adjoining fire compartment

**Vertical evacuation**

Additional risks are present to clientele during vertical escape phase

# Statutory Requirements

- **Fire Services Ordinance, Cap. 95, Laws of HK**
- **Dangerous Goods Ordinance, Cap. 295, Laws of HK**
- **Fire Safety (Commercial Premises) Ordinance, Cap 502, Laws of HK**
- **Fire Safety (Buildings) Ordinance, Cap 572, Laws of HK**

# Fire Services Ordinance, Cap.95

- Passageways, corridors, staircases, staircase landings and smoke lobbies clear from obstruction
- Smoke stop doors closed and unlocked
- Fire Service Installations or equipment in efficient working order
- No obstruction to any Fire Service Installations and equipment
- Annual inspection of FSI by Registered Fire Service Installations Contractor

**Fire Escape**



# Dangerous Goods Ordinance, Cap.295

s.(6) “Except under and in accordance with a licence granted under this Ordinance, no person shall manufacture, store, convey or use any dangerous goods”

- Example: Oxygen cylinder
- Exempt Quantity: Not more than 2 cylinders



# Fire Safety (Commercial Premises) Ordinance, Cap502

# Fire Safety (Buildings) Ordinance, Cap572



| Premises/Building  |                  | Composite Building / Commercial Building (Pre-1987)  |                |                                  |
|--|------------------|--|----------------|----------------------------------|
| Fire Service Installations and Equipment                       |                  | Commercial/Non-domestic Portion (Cap. 502 & Cap.572) |                | Domestic Portion (Cap. 572 only) |
| Emergency Lighting   | Common areas     | Owner  | Occupier       | Owner                            |
|  | Non-common areas |  |                | ✓                                |
| Automatic cut-off device for the mechanical ventilating system | Common areas     | ✓  |                |                                  |
|  | Non-common areas |  | ✓              |                                  |
| Fire Extinguisher  | Non-common areas |  | ✓<br>(Cap.502) |                                  |

# Conclusion

- ▶ Risk Assessment
- ▶ Mitigation Measures
- ▶ Statutory Requirements



# Thank you