



Fires in Tall Buildings: The Lingering Issues

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**GREATER
MANCHESTER**
FIRE AND RESCUE SERVICE



NFCC
National Fire
Chiefs Council

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Assumptions and Limitations



- A failure of a single assumption can lead to a domino effect of multiple failures.
- It is entirely foreseeable that an intervention focussed approach to a tall building catastrophically failing in fire is beyond the physiological limitations of a firefighter and may be beyond the physical and technological limitations of a fire and rescue service.

The Operating Environment



Grenfell Tower
Inquiry

manchester
arena
inquiry

Complexity and Height

- Structures often have **limited access for firefighting, long travel distances, and compartment challenges** that slow intervention.
- Vertical firefighting in a **failed fire-protected environment** poses significant challenges.
- NFCC and LGA guidance acknowledges that buildings may be designed with **assumptions that do not hold under fire stress**, such as fire doors remaining closed or compartmentation remaining intact.



The Assumptions We Make

- The original construction and any renovations / remedial work conform to acceptable standards.
- The building is occupied and used as designed in the fire strategy.
- The building is well managed, and all systems are working correctly in line with the fire strategy.
- Occupants can evacuate if they choose to do so.
- Any fires that do occur, conform to foreseeable 'common' (traditional) scenarios and heat release rates.
- Arson, terrorism and deliberate fire raising is managed out.
- There will be a FRS response within agreed timeframes, with adequate resources.
- Sufficient firefighting water is available at required pressures and flowrates.
- Our Policies and Procedures are fit for purpose.
- Confident decision making.



When Those Assumptions Fail



- Wind impacted fire event.
- Failure of external wall systems.
- The fire gets 'out of the box'.
- Ineffective water.
- Prolonged tactical ineffectiveness / interference.
- Extended burn time without intervention (>18mins?).
- Smoke domination.
- The fire is well beyond suppression capabilities.
- Fire will require a tactical change (Plan B, C....).
- Indecision or failure to recognise the building is failing.

How Much Space Have We Got to Play With?

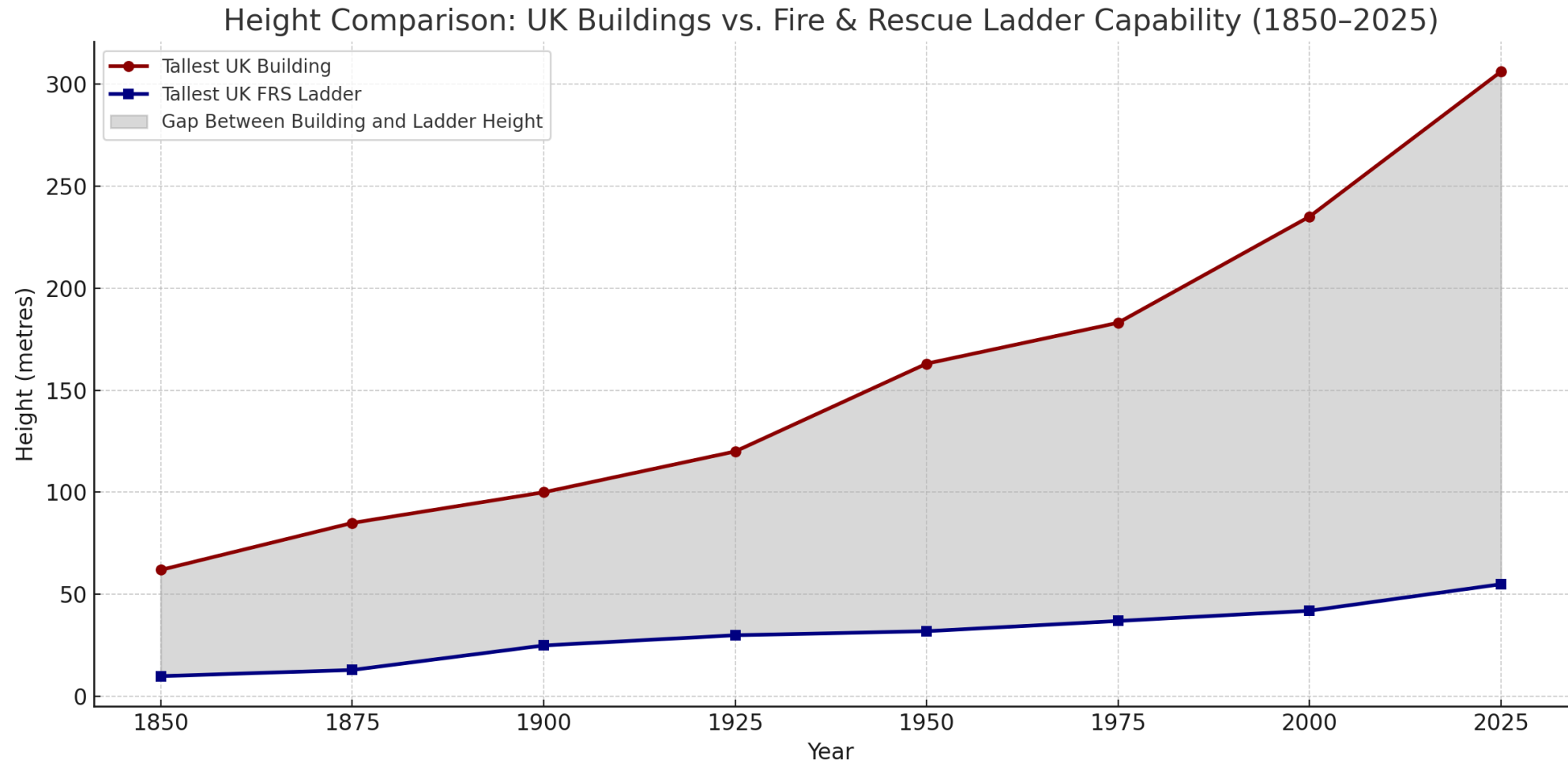


Technical Limitations of FRSs



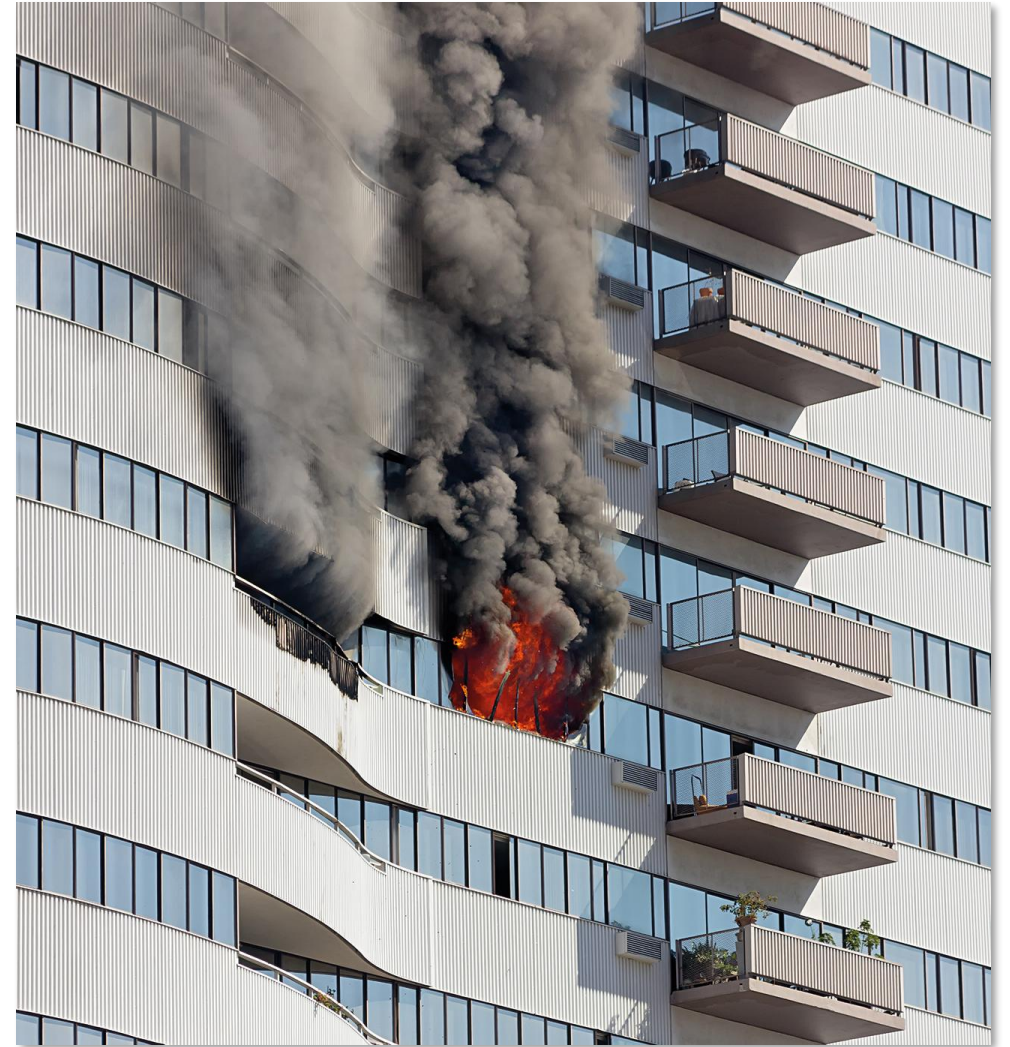
- Fire services are equipped to fight fires within certain thresholds:
 - Appliance reach
 - Water supply limitations at height
 - Breathing apparatus endurance
 - Pumping capacity and pressure loss at height
- BS 9999 and Approved Document B assume fire service interventions only supplement robust fire protection strategies — they are not the primary defence.
- Manual firefighting is not designed for total fire suppression in failed buildings, especially at height or with extreme heat release rates.

Appliance / Ladder Reach



Physiological Limitations of Firefighters

- Firefighters face:
 - Heat stress and exhaustion
 - BA duration and weight limitations
 - Cognitive load under duress
- Limits on safe working time at height or in compromised buildings



RICE: Rescue – Intervention – Containment - Evacuation

RESCUE

Life Safety
Intervention

INTERVENTION

Firefighting:
Compartment Entry

CONTAINMENT

Actions to Limit
Internal & External
Fire Development &
Spread

EVACUATION

Part or Total

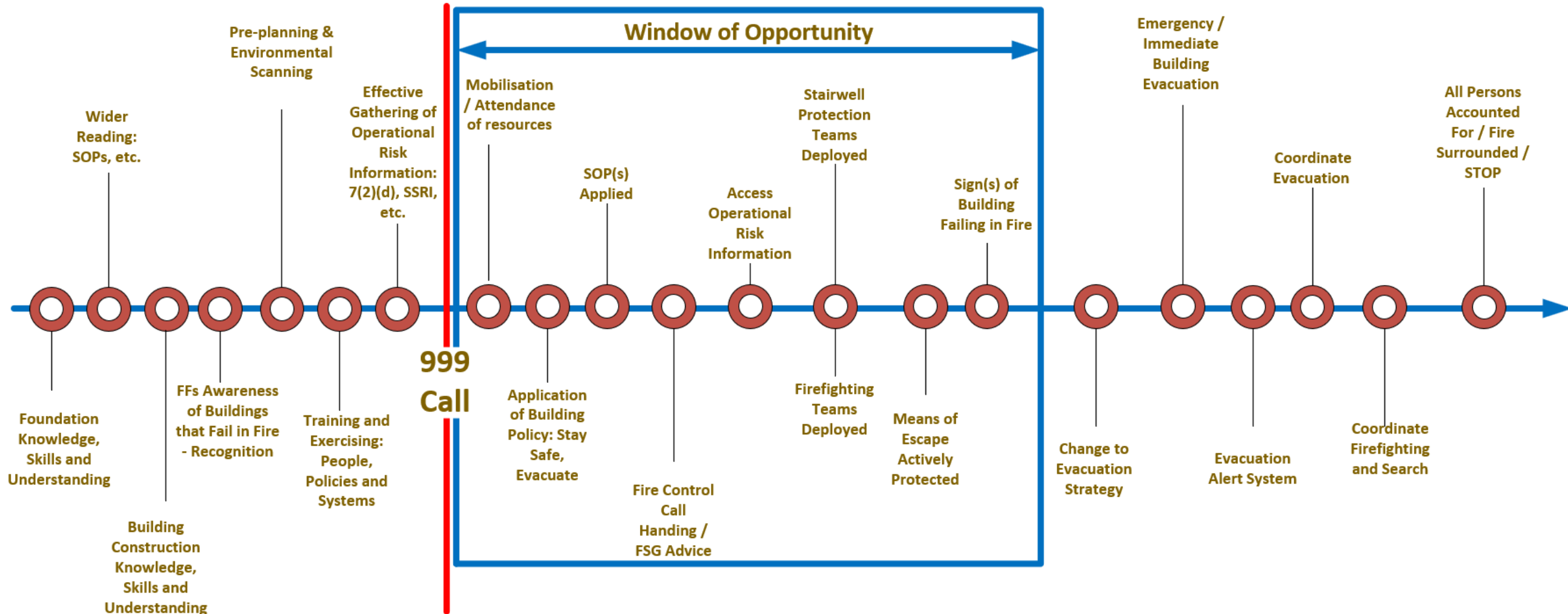
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The 'Mega-Fire' Scenario



Pacific Palisades, California, 2025: Adobe stock photo.

Buildings that Fail: Window of Opportunity



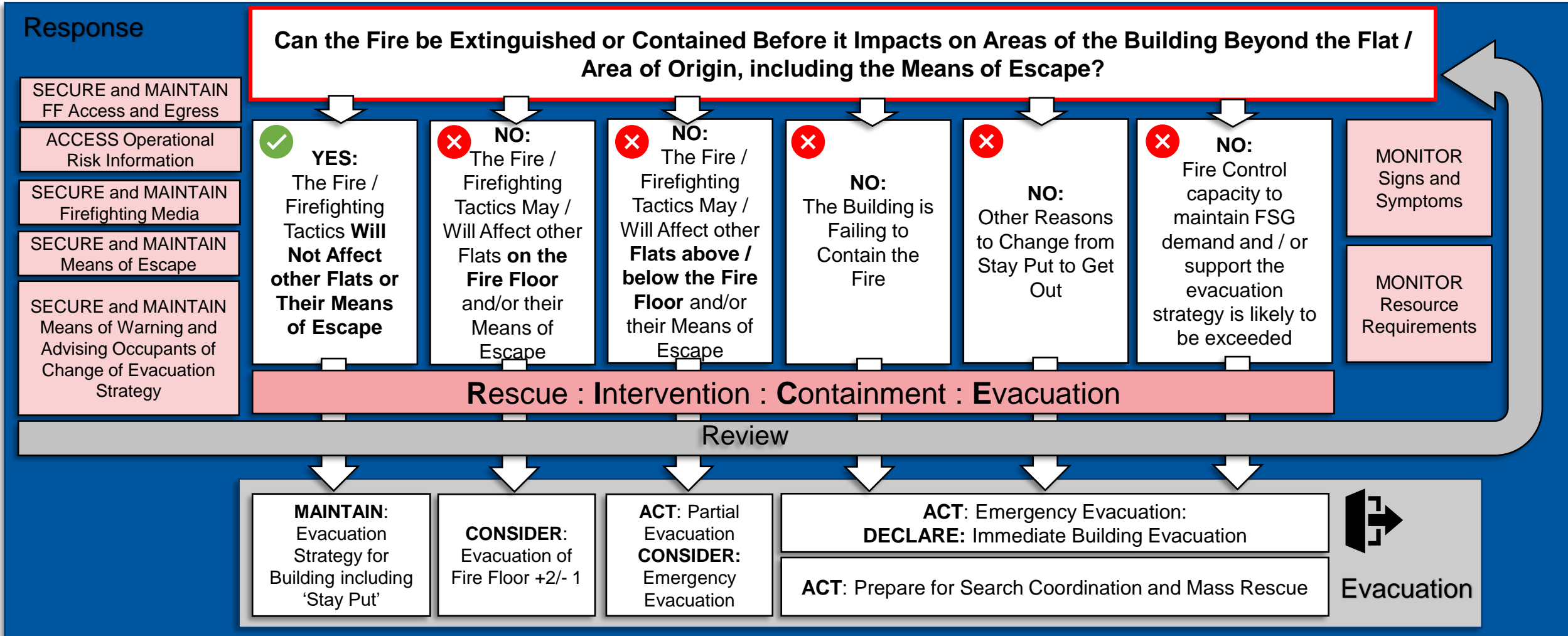
Smoke Curtains



NFCC Evacuation Decision Making Model

Can the Fire be Extinguished or Contained Before it Impacts on Areas of the Building Beyond the Flat / Area of Origin, including the Means of Escape?

NFCC Evacuation Decision Making Model



Final thoughts – Let's Not Fail



Thank You



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