

Evaluating Passive Fire Protection in Risk Assessment: A Holistic approach

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About the Speaker



Sourav Chatterjee

Eng. Sourav Chatterjee is an experienced and knowledgeable insurance professional with 13+ years of expertise in risk consulting and engineering, with an emphasis on loss prevention of large, complex construction, infrastructure projects, renewable energy risks etc in the Middle East and Asian market.

His experience also involves Project consultation, reviewing adequacy of fire protection system design, performing ITM of fire protection systems as part of his work.

Sourav is a Fellow of Insurance Institute of India (III) and holds a bachelor's degree in mechanical engineering.

He has worked as a senior risk consultant in various major multinational companies in UAE and India such as AIG, RSA, LTI, CMSRS where he gained a deep understanding of various local and international loss prevention standards and is well connected in the insurance market within MENA and Asian regions.

About the Company

Lockton is the world's largest independent insurance broker.

What makes Lockton stand apart is also what makes us better: independence.

Lockton's private ownership empowers its 12,500+ Associates doing business in over 135 countries to focus solely on clients' risk and insurance needs. With expertise that reaches around the globe, Lockton delivers the deep understanding needed to accomplish remarkable results.

Our 96% client retention rate speaks for itself.

12,500⁺

Associates Worldwide

96%

Client
retention rate

14%

Revenue growth

65,000⁺

Clients in over
140 countries

135⁺

Offices
worldwide

\$3.55B

2024 Global
revenue

\$65bn⁺

Premiums placed

90%

Reinvestment due to our
private ownership

\$17m⁺

Charitable donations to more
than 250 organisations

An abstract geometric composition featuring overlapping triangles in white, black, and maroon. The triangles are arranged in a dynamic, layered fashion, creating a sense of depth and movement. The white triangles are prominent, often acting as a backdrop for the darker shapes. The black triangles provide sharp contrast, while the maroon triangles add a rich, warm tone. The overall effect is a complex, three-dimensional visual structure.

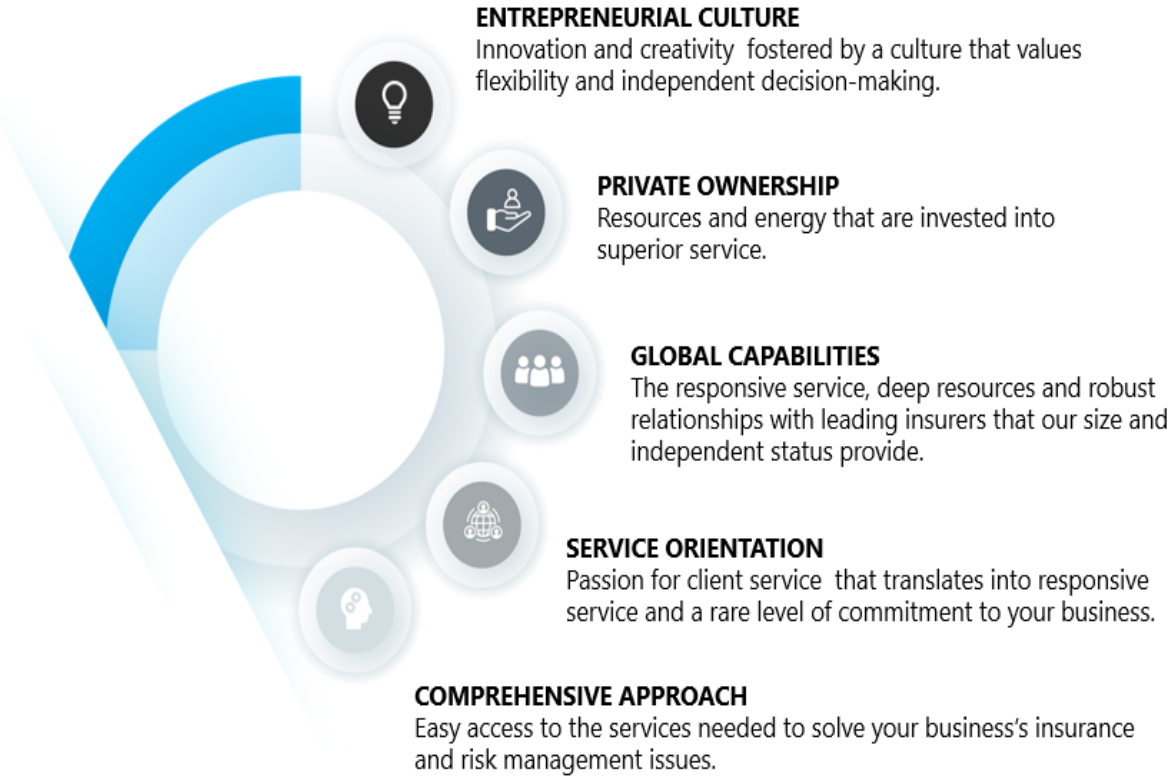


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The Lockton Difference

*A service-minded
culture makes
us different*



Industry Expertise



Aviation



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Financial Institutions



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Manufacturing



Marine



Retail

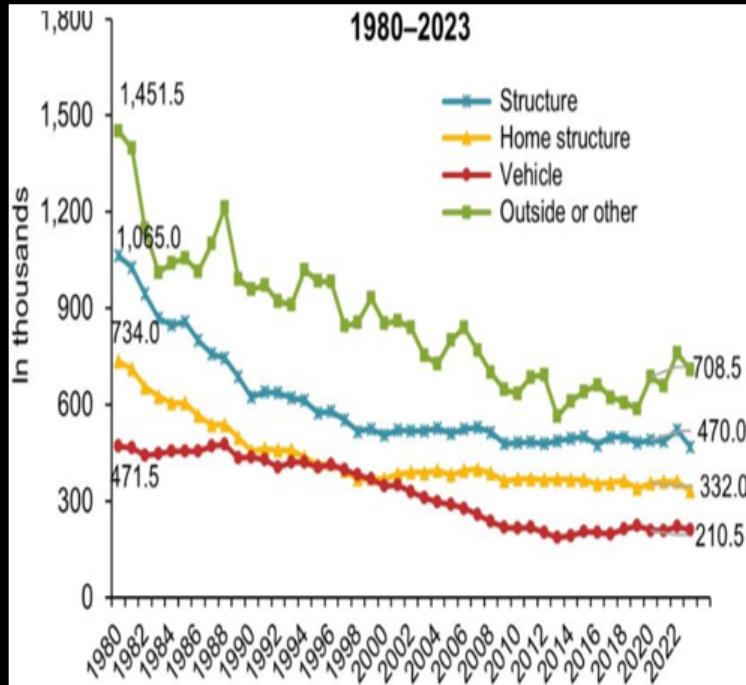


Real Estate

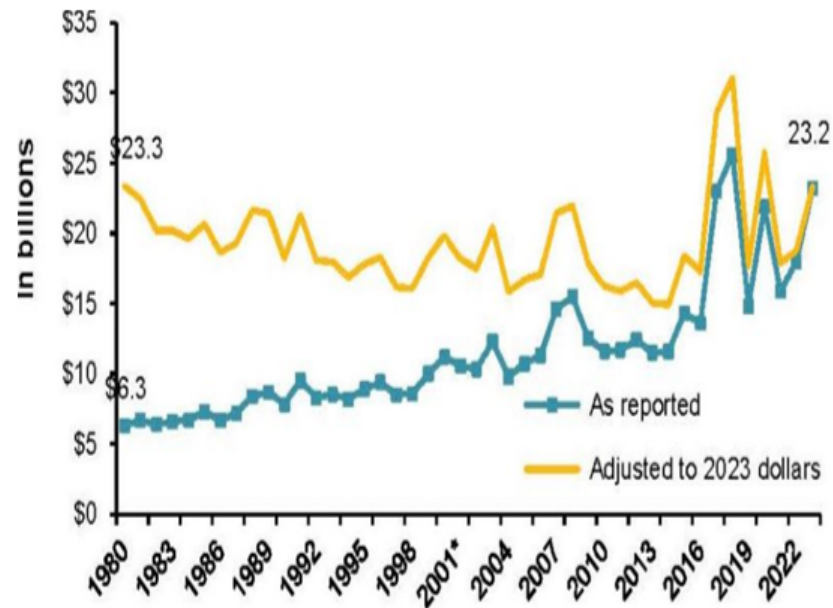


Technology

Some Fire statistics-USA

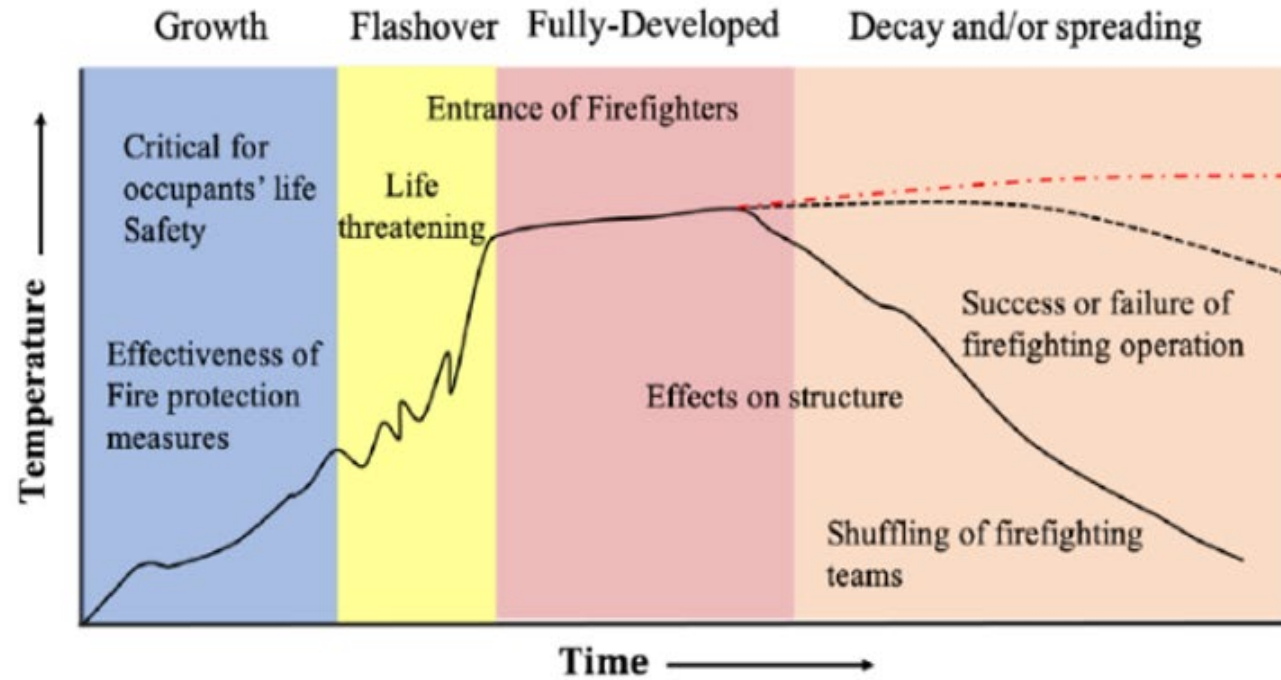


Fires by incident type-in US 1980-2023-Source-NFPA

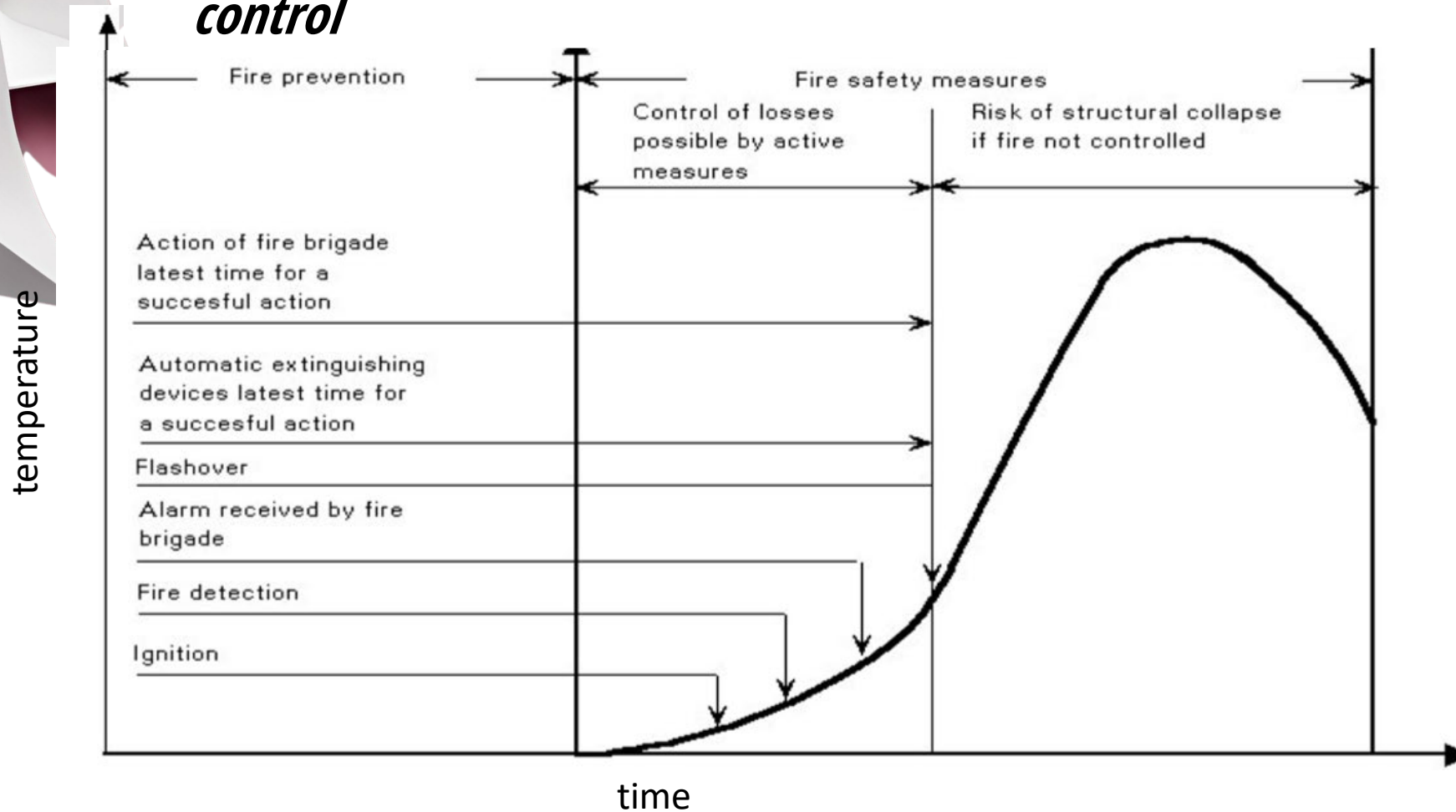


Estimated fire property loss in US-*by year excluding \$33.4 billion loss from 9/11/2001-Source-NFPA

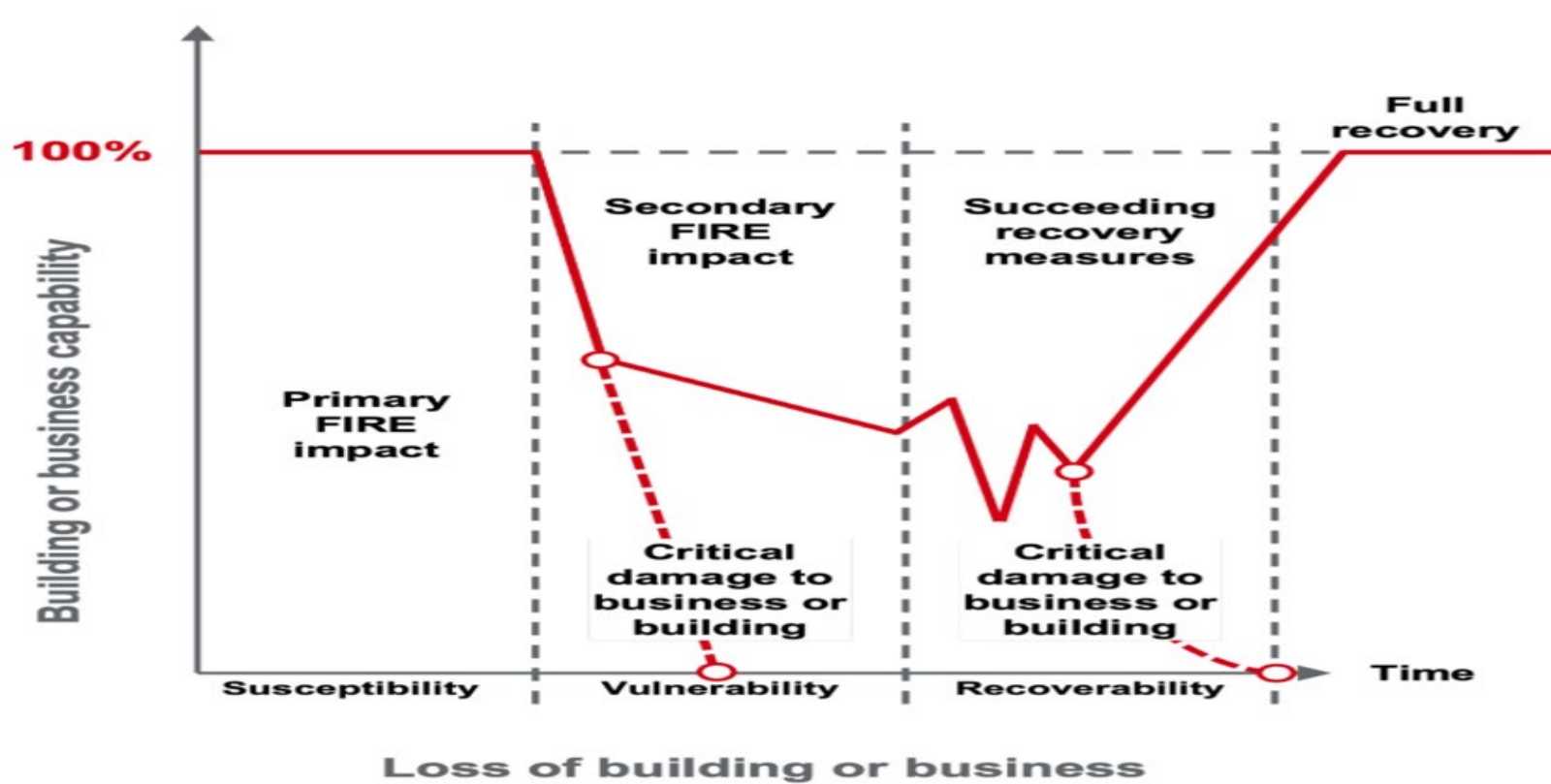
Understanding the synergy between passive and active fire protection measures in a typical building fire



Fire precaution measures and conditions for effective control



Essential principles-passive fire protection by design



Ensuring a building is resilient minimizes the risk that its normal function is disrupted by adverse events.
(Source- BDM01 A to Z of Essential principles version 3-2023 by RISCAuthority, UK)

Key Differences in Resilience Strategy



i. Relies on systems that can actively detect, suppress or mitigate fire.

ii. Critical for situations where containment alone isn't sufficient(eg high rise buildings, areas with complex layouts etc)

iii. It requires regular maintenance to ensure reliability in a fire emergency



i. Prevents the spread of fire or smoke by containing it within designated compartments, thereby reducing damage and providing valuable time for evacuation and response.

ii. A more resilient approach for preventing fire spread, as it functions continuously, regardless of the fire's stage.

iii. It's a long-term solution embedded within the building structure, while active systems depend on external factors like power or activation.

Resilience Strategy Summary



Active systems are reactive, designed to control or suppress fire once it occurs. They are essential in high-risk scenarios but can fail due to maintenance issues or power loss.

Passive systems are preventive and work to slow or stop the spread of fire. They are critical for enhancing resilience by providing a more reliable means of fire containment

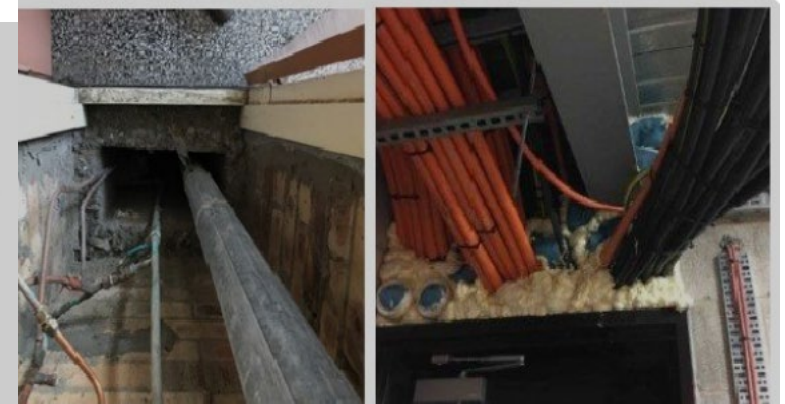
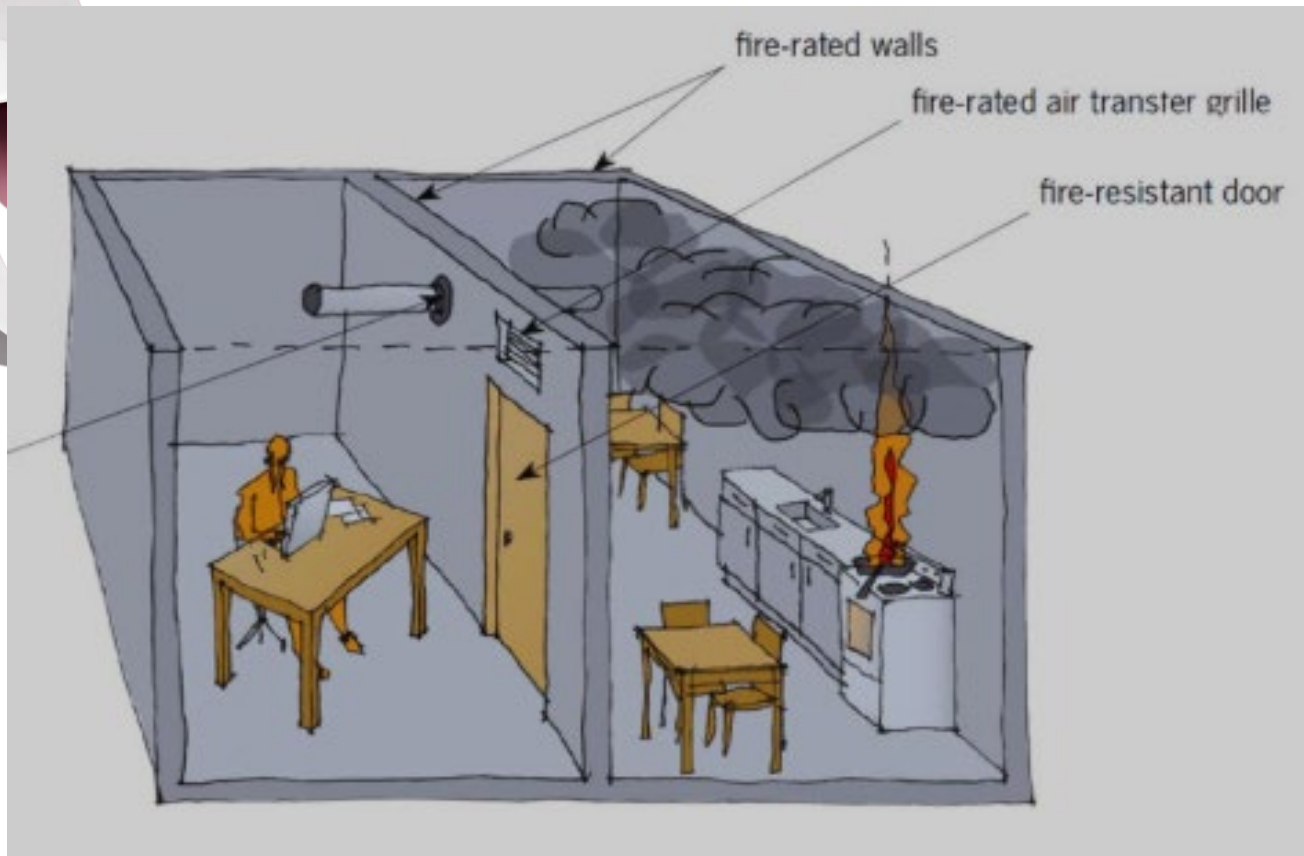


**Both strategies are complementary:
Active Fire Protection helps to manage the fire's intensity and speed, while
Passive Fire Protection ensures that fire containment and building resilience are maintained, even if active systems fail.**

Risk Management and Insurance



Ideal Vs Actual(in many cases)



How to incorporate PFP into a risk-based evaluation?

Hazard identification &
Risk assessment

Fire Safety design
evaluation

Evaluate building use
changes

Maintenance &
monitoring

Compliance & code
adherence(e.g. NFPA,
FM, LPCB, BSI, AHJ)

Risk mitigation & PFP
integration

Training & awareness

Continuous
improvement

Best practices for assessing PFP in different types of buildings?

Low rise buildings-
(mainly single-family
homes, multi unit
complexes etc)

Fire compartmentation

Common areas

Fire stopping & seals

Building materials and long-term
considerations

High rise buildings-
(mainly commercial,
healthcare, hotels etc)

Fire compartmentation & zoning

Elevator & stairwell protection

Fire doors & dampers

HVAC systems and long-term
considerations

Industrial

Fire compartmentation & zoning

Fire barrier & fire-resistant
materials

Storage areas

Hazardous materials

Fire doors & shutters

• Explosion risk & long-term considerations

Contd.- General best practices across all building types

Regardless of building type, certain fundamental best practices should apply-

Regular, detailed fire protection audits should be conducted to ensure all PFP elements are intact, functional and compliant with current fire codes. This should include visual inspections and testing of materials particularly in high-risk areas.

Maintain up-to-date records of fire protection assessments, including inspections, maintenance, and any updates or changes to the building. Ensure compliance with local building codes, NFPA (National Fire Protection Association) standards, and international fire safety standards.



Occupants, maintenance staff, and building managers should be trained on the importance of passive fire protection and how to recognize when it is compromised. They should be made aware of fire safety protocols to help preserve the effectiveness of passive fire protection system.

Ensure that all passive fire protection materials (fire-rated walls, doors, ceilings) meet the appropriate fire-resistance ratings for their intended use and occupancy.

Emerging fire risks in buildings

Flammable cladding
(e.g ACP)

Building materials &
insulation

Green roof &
vegetation

Electrical systems &
wirings

Unregulated
additions or
renovations

Furniture &
upholstery materials

Battery & Energy
storage
systems(BESS)

Unintended
combustibles

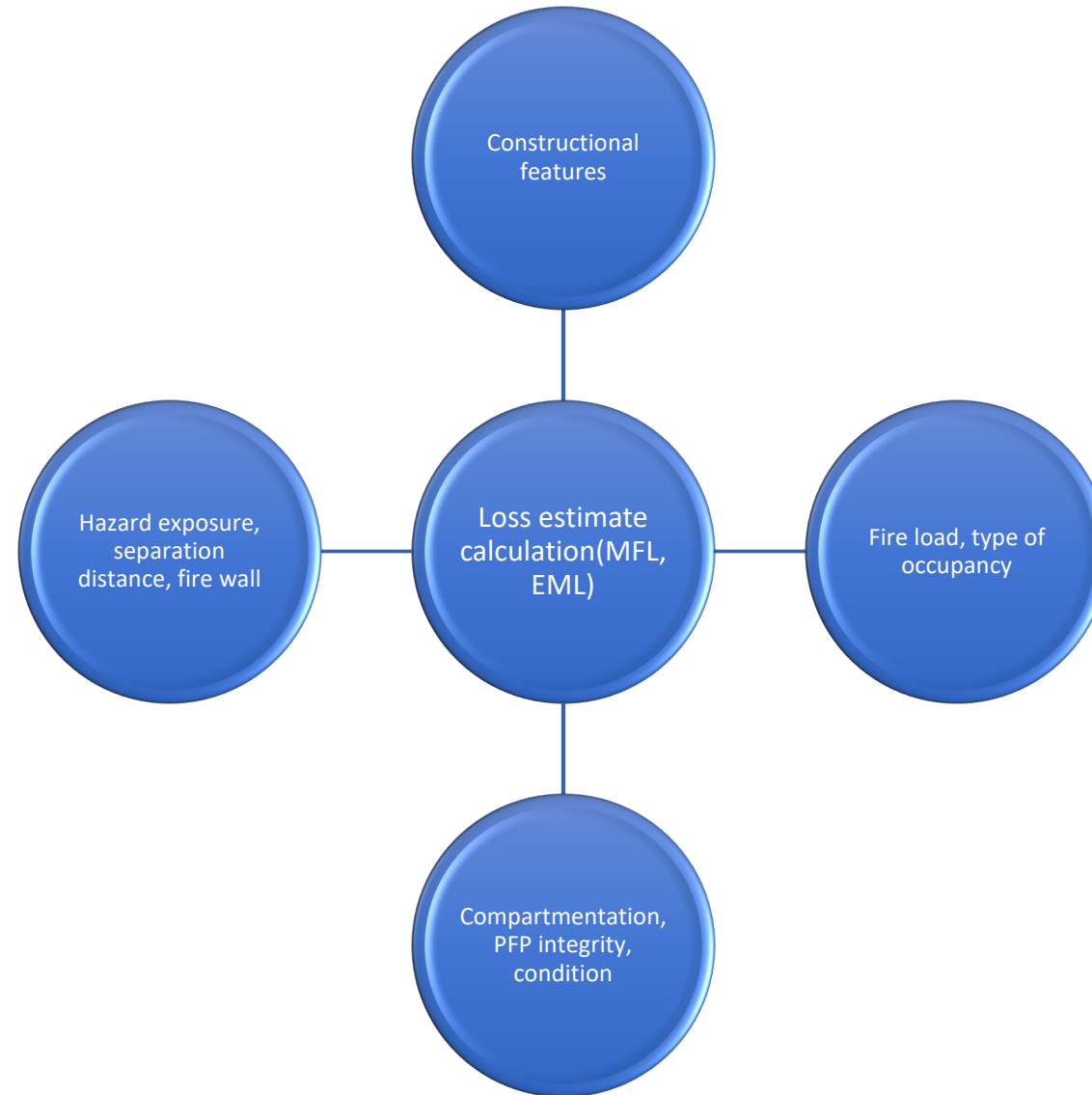
Fire safety systems
not upgraded

Cyber security &
smart building risks

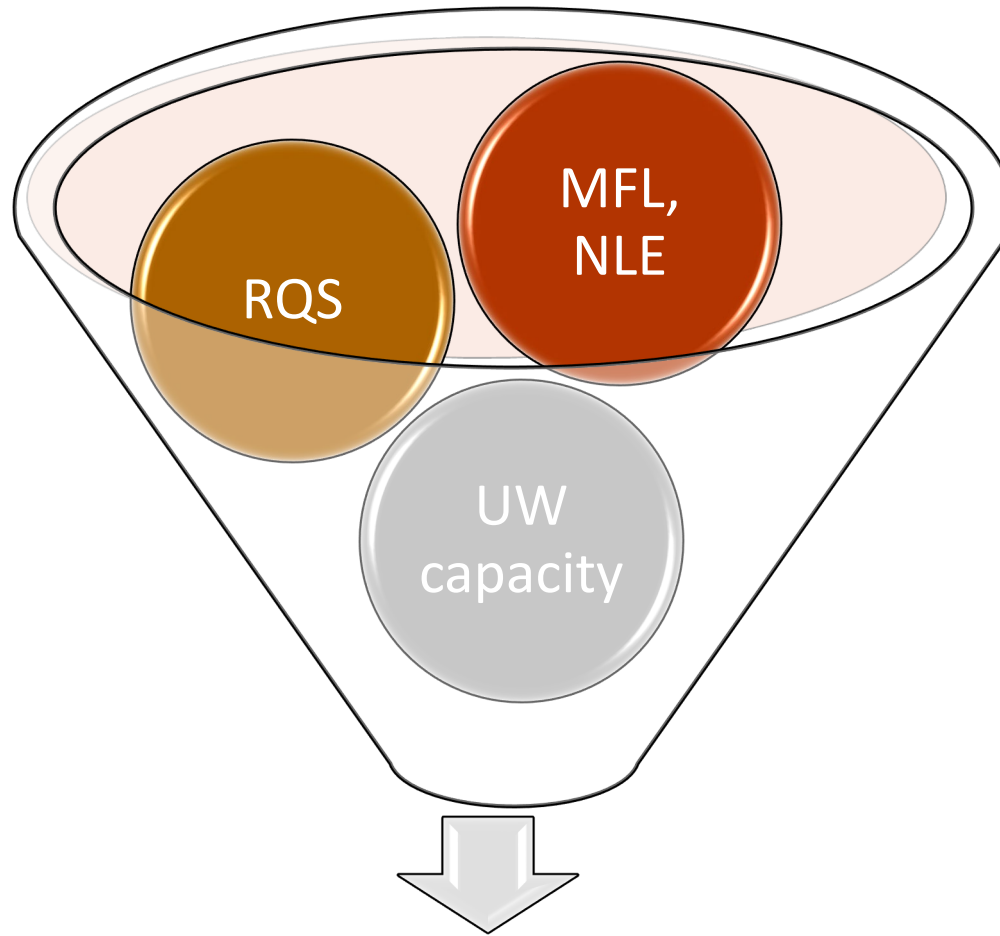
Increased occupancy
& mixed-use
developments

Climate change
effects

Role of PFP in Insurance loss estimate calculation



Importance of PFP on Insurance cycle



Denial/restricted coverage, multiple Co-ins, Re-ins
players, possibility of delay in claim settlement

**Case studies highlighting the challenges and successes of
implementing a holistic fire protection strategy**

Case study 1- The Lakanal house fire(London, 2009)

Incident Summary:

The Lakanal House fire killed six people and injured 20 others. The fire spread quickly through the building, exacerbating the situation. The building had been designed with compartmentation to contain fires in individual flats, but the fire spread through open windows and gaps in the building's fire-resisting walls.

How PFP Was Compromised:

- **Failure in Compartmentation:** While the building had been designed with fire-resistant walls, there were significant failures in maintaining these barriers. Fire-resistant doors were often left open or obstructed, and gaps around window frames were not properly sealed.
- **Lack of Firestopping:** Penetrations around services like electrical wiring and pipes were not properly sealed with fire-resistant materials, allowing smoke and fire to spread across floors.
- **Windows and External Spread:** The fire spread rapidly between flats via windows, due to the use of inadequate fire-resistant glazing or lack of fire barriers between windows in the facade.

How an Assessor Could Have Prevented It:

- A fire risk assessor could have identified that fire doors and compartmentation barriers were not properly maintained or had been compromised by open or obstructed doors. They could have recommended a more rigorous inspection and maintenance routine for these elements.
- They would also have noticed the failure in firestopping around service penetrations, ensuring that these gaps were sealed properly to prevent the spread of fire and smoke.
- A proper assessment could have identified the need for better window fire-resistance measures or fire barriers to prevent fire from spreading across the building externally.



Case study 2-The Melbourne Lacrosse Tower Fire (Australia, 2014)

Incident Summary:

In Melbourne, a fire broke out on the 21st floor of the Lacrosse Tower, which spread quickly up the building's facade. Thankfully, there were no fatalities, but the fire caused significant property damage and raised concerns about building safety.

How PFP Was Compromised:

- **Flammable Cladding:** The building's exterior was clad with highly flammable aluminium composite panels. The fire spread along the facade because the cladding material did not have adequate fire resistance.
- **Lack of Fire-Resistant Barriers on the Facade:** The fire spread vertically between the floors along the exterior of the building, bypassing internal fire barriers.

How an Assessor Could Have Prevented It:

- A fire risk assessor should have identified that the choice of cladding material was not compliant with fire safety regulations and that it posed a significant fire risk.
- They could have recommended replacing the cladding with fire-resistant materials to prevent external fire spread.
- Assessors could have also ensured that the building design incorporated adequate fire barriers along the facade to contain fire within each floor and prevent it from spreading up the building's exterior.



Case study 3-Al Shams tower (Abu Dhabi, 2016)

Incident Summary:

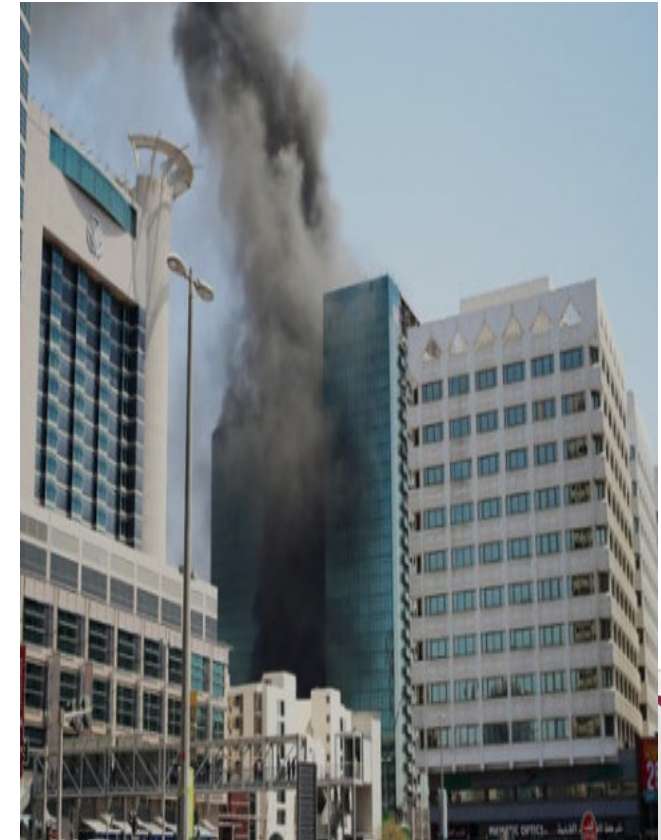
A significant fire broke out in the Al Shams Tower, a high-rise building in Abu Dhabi, in 2016. The fire, which started on the upper floors, caused considerable damage but fortunately did not result in any fatalities.

How PFP Was Compromised:

- **Flammable External Materials:** Like other high-rise fires, the fire spread quickly along the external facade, which was clad with aluminum composite panels (ACP) that were highly flammable.
- **Failure of Firestopping Measures:** The building had gaps in firestopping around services such as electrical cables and pipes, which allowed fire and smoke to spread between floors, bypassing the compartmentation system.
- **Lack of Maintenance of Fire Doors and Barriers:** There were reports that fire doors were either blocked or left open, which meant that fire and smoke could migrate from one apartment to another, exacerbating the fire's spread.

How an Assessor Could Have Prevented It:

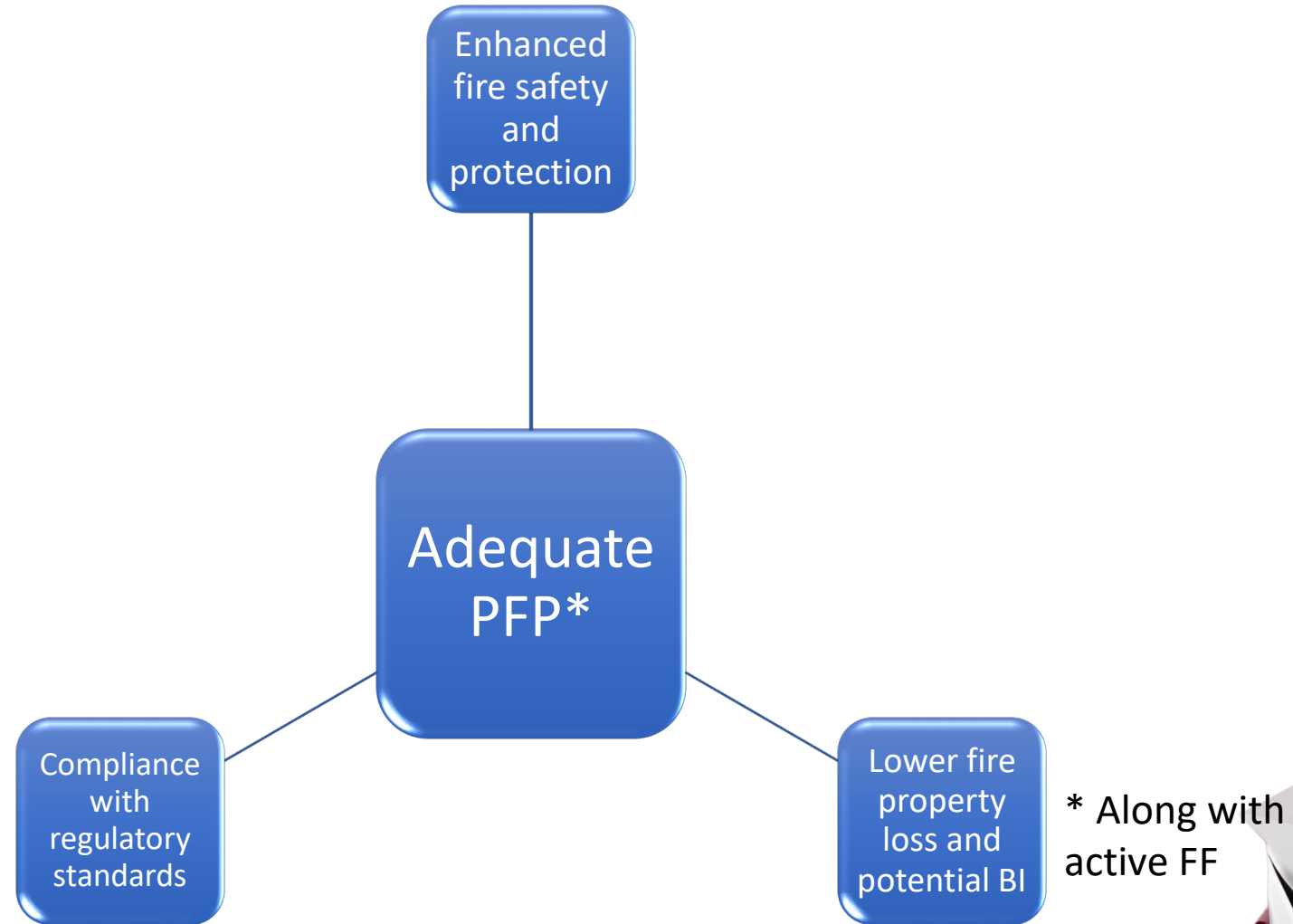
- A fire risk assessor would have identified the fire risk posed by the use of combustible cladding and recommended replacing it with fire-resistant alternatives to prevent external fire spread.
- They would have conducted thorough inspections of the building's firestopping systems, ensuring that service penetrations were sealed and that there were no gaps through which fire and smoke could pass.
- The assessor would have also ensured that all fire doors were operational, well-maintained, and not obstructed, and that compartmentation was intact to contain the fire within the affected area.



Key takeaways-

- **In all these cases, the failures in passive fire protection were primarily due to poor maintenance, improper materials, or inadequate inspections. Fire risk assessors could have played a significant role by identifying these issues in advance, recommending necessary improvements, and ensuring that building owners complied with fire safety regulations.**
- **A fire risk assessor's job is not only to look at existing risks but also to foresee potential hazards caused by weaknesses in passive systems, whether due to poor construction practices, aging materials, or improper modifications to the building. Regular, thorough assessments and updates to fire safety measures could have prevented many of these tragedies.**

The Importance of PFP- A silent guardian



Thank You

Any Questions