

Passive Fire Protection (PFP) in the Built Environment – An Insurer's Perspective

Laxminarayan Nayak

Acting Group Head of Risk Engineering & Risk Engineering
Lead, UAE and Bahrain

A thick, white, stylized wave graphic that spans the width of the slide. It starts with a small peak on the left, followed by a larger, more prominent peak in the center, and ends with a smaller peak on the right. The wave is composed of smooth, rounded curves.

Laxminarayan Nayak



Eng. Laxminarayan Nayak is an experienced risk engineering professional with a strong background in conducting high-hazard technical risk assessments and business resilience reviews for the insurance and reinsurance industry. Specializing in a diverse range of occupancies, having worked in several Middle Eastern countries.

Mr. Nayak is a Ph.D. Research Scholar in Reliability Engineering at IIT Kharagpur. Mr. Nayak holds a bachelor's degree in mechanical engineering and an M.Tech degree in Chemical Engineering with a specialization in Safety Engineering from the National Institute of Technology (NIT), Rourkela, India.

Risk consulting experience in over one thousand different types of high-value residential & commercial building complexes, renewable energies, industrial occupancies including chemical industries, power risk, metal & manufacturing, and special occupancies. Additionally, his experience involves project consultation, building material selection, reviewing the adequacy of the fire protection system design, performing ITM of FPS, training, etc.

He is passionate about risk management of emerging risks like cybersecurity, multifaceted technological risk consulting, etc. Presented international conference papers on "A Cyber Resilience Risk Assessment Framework Proposal Based on Bow-Tie Analysis of Industrial Control System" and "Fire Safety Challenges and Loss Prevention Strategies of Roof-Mounted Solar Photovoltaic Panels".

Connect with Mr. Nayak to discuss risk management strategies and solutions for different types of occupancies. Let's navigate the complexities of emerging risks together for a sustainable future.

Fire Insurance: A Brief History



- The first property insurance company still extant was founded in 1710, the RSA Insurance Group.
- Initially, each company employed its own fire department to prevent and minimize the damage.



- Colonial America – in 1752, Benjamin Franklin founded the Philadelphia Contributionship for property insurance, but refused to insure certain buildings.

Property insurance can be traced to the Great Fire of London



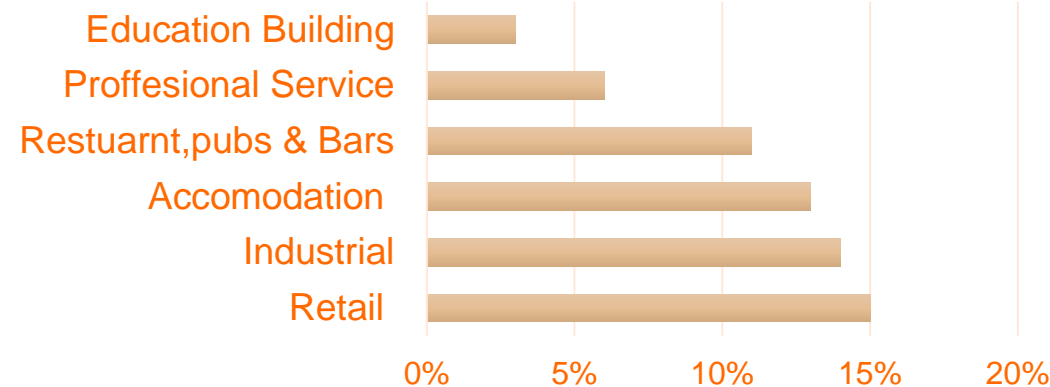
Pudding Lane, with a memorial column marking the ignition point of London's fire and the burnt area.

Building Fires: A Persistent Threat

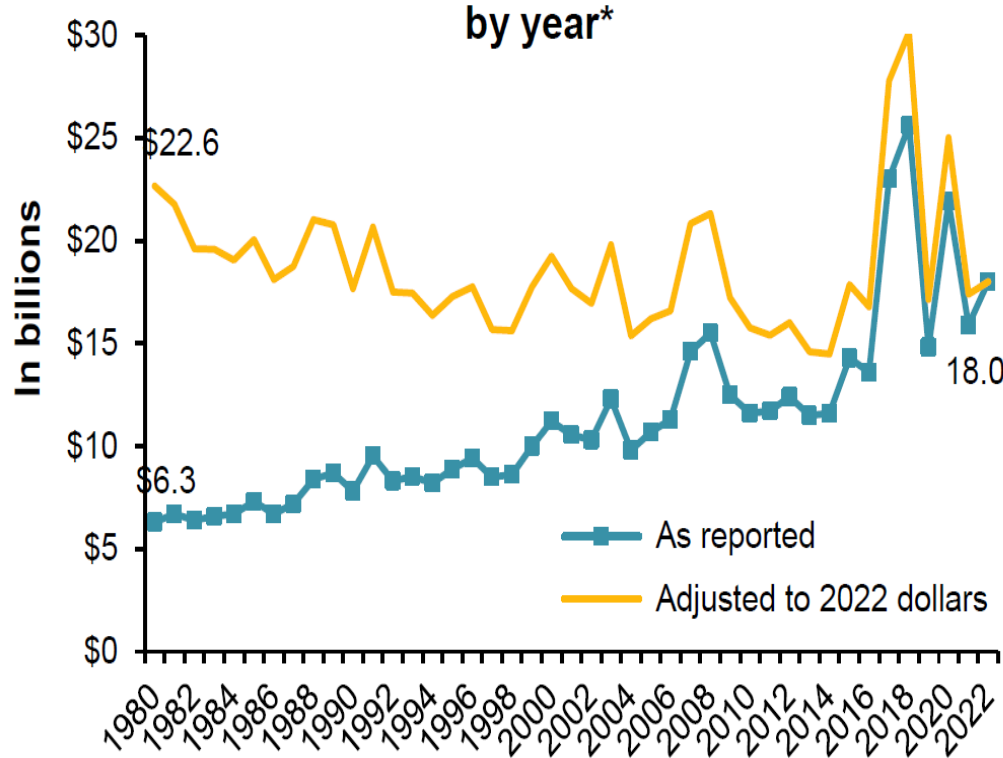


The Analysis of 4,782 Major UK fires from 2009-2019

Mean average loss of £657,074 per incident.



USA Estimated Fire Property Loss

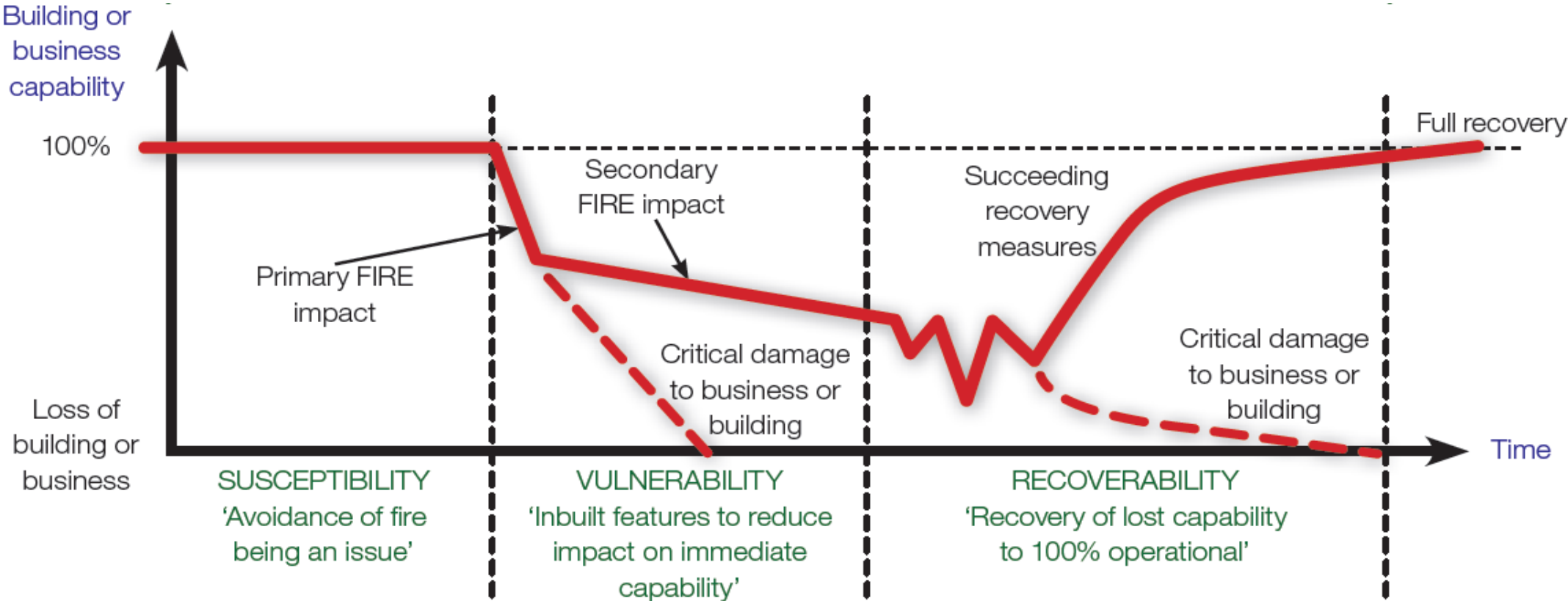


*Excludes the \$33.4 billion loss from 9/11/2001, which would adjust to \$64.5 billion in 2022 dollars.

Resilience Strategy

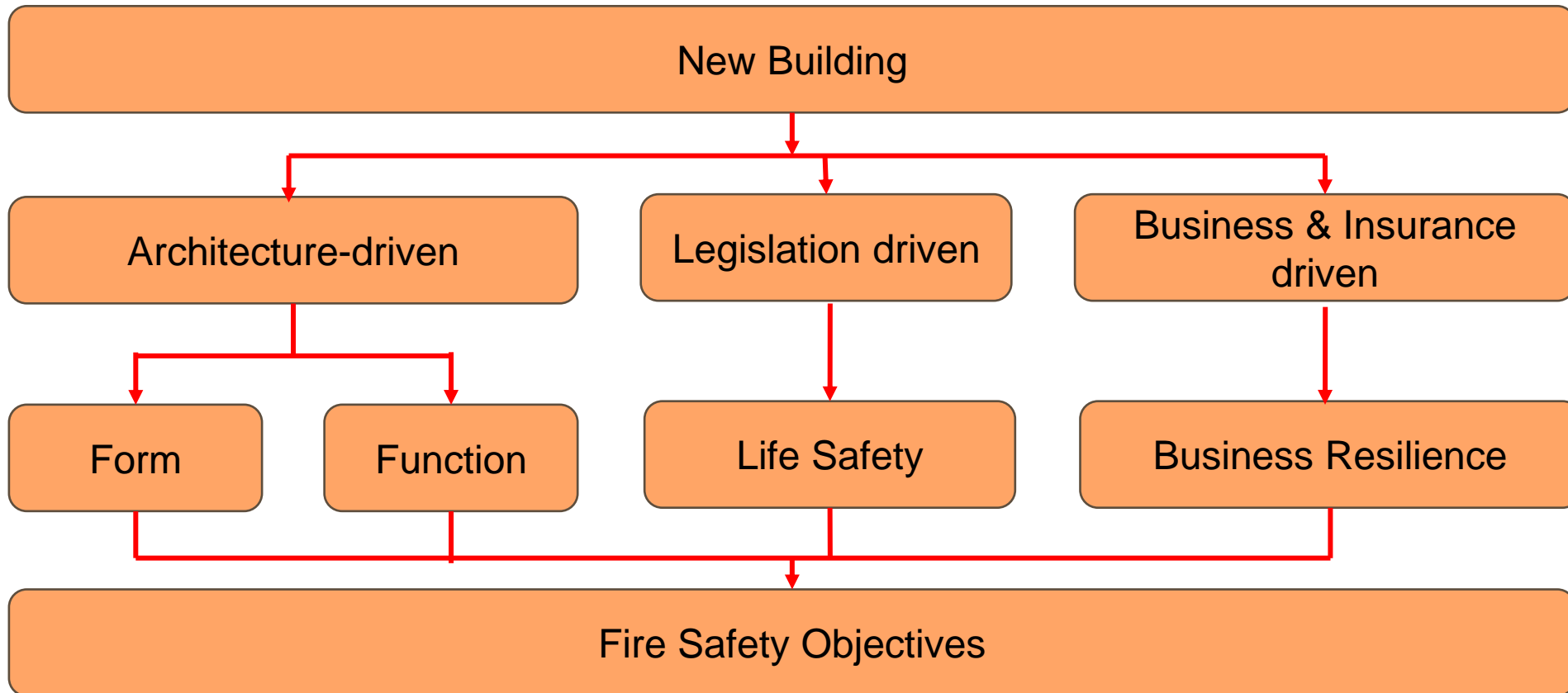


Strike the Right Balance Between Active and Passive Fire Protection



Fire Safety Engineering Principles Framework

The application of scientific and engineering principles to the protection of people, property and the environment from fire.



Ref: BS 7974 Application of fire safety engineering principles to the design of buildings.

Footer Line Goes Here

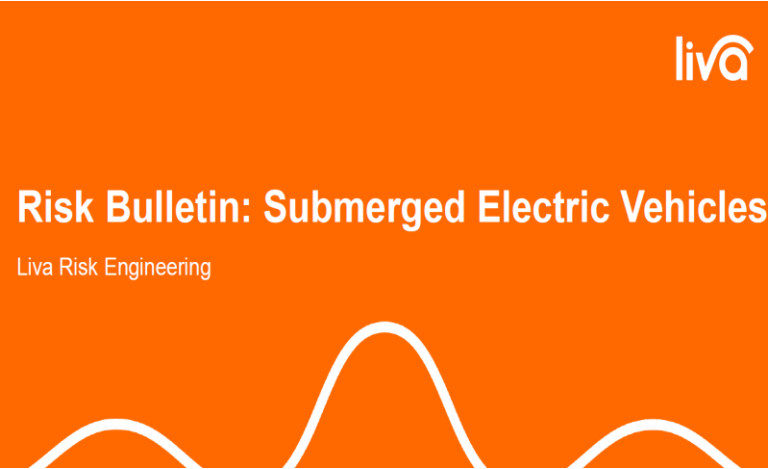
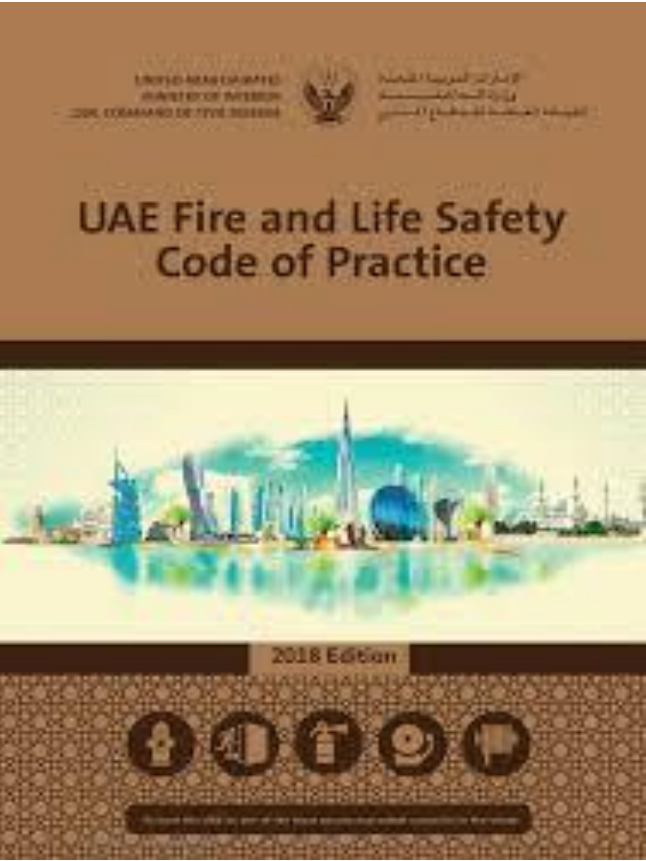
Insurer Standards in Fire Safety



AHJ Codes

International Standards & Certification/Listing Bodies

Insurance Company Risk Advisory



Risk Bulletin: Submerged Electric Vehicles

Liva Risk Engineering



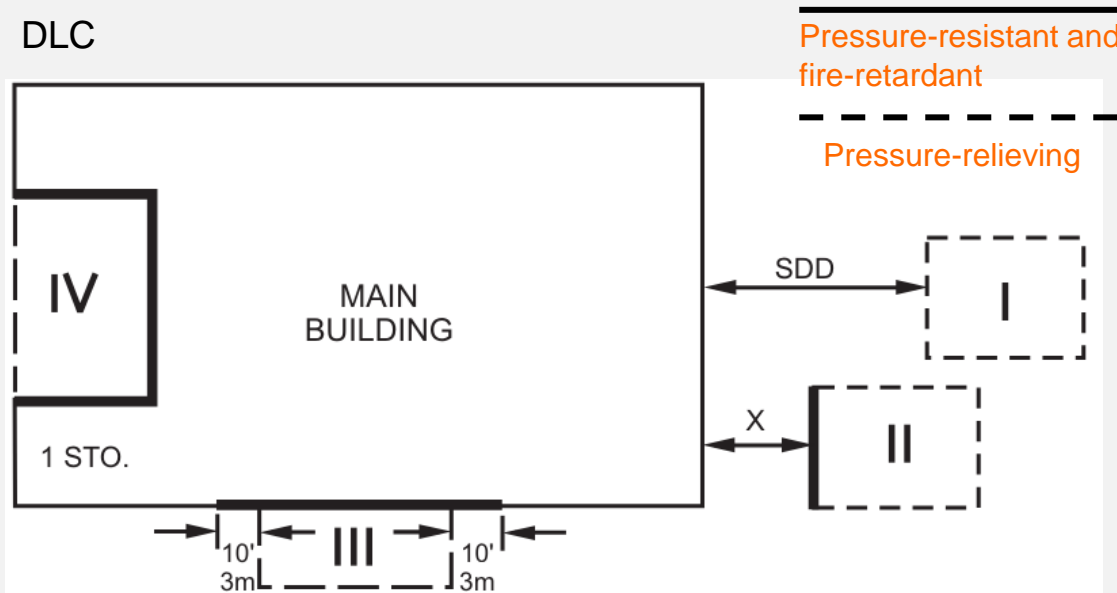
Metallic Building Envelope Review Checklist

Business unit name:		Name of the Building:			
Construction / Re-roofing / Repair Date:		Type of Roof: Flat/Sloped			
<i>Condition Grading (check as appropriate and comment)</i>					
<i>Good (G) – the assessed components are deemed in good shape and needs no attention beyond routine inspection</i>					
<i>Fair (F) – some components are showing signs of deterioration but have not yet reached a state of emergency</i>					
<i>Poor (P) – needs immediate attention</i>					
<i>Note - Fill one checklist per building/area at least quarterly</i>					
Items	Building Condition	G	F	P	Action Taken or Recommended
Building interior (walls, ceiling & insulation)	Leaks/signs of water staining				
	Condition of fire doors, fire walls/barriers and protected openings				
Penetrations through wall & roof panels	Condition of access doors, shutters, and windows				
	Pipes, cables, ducts, etc.				
Metal wall panels	Vents, Skylights, Access hatch				
	Panel condition (Looseness, damage, deterioration, etc.)				
	Seam/joint condition				

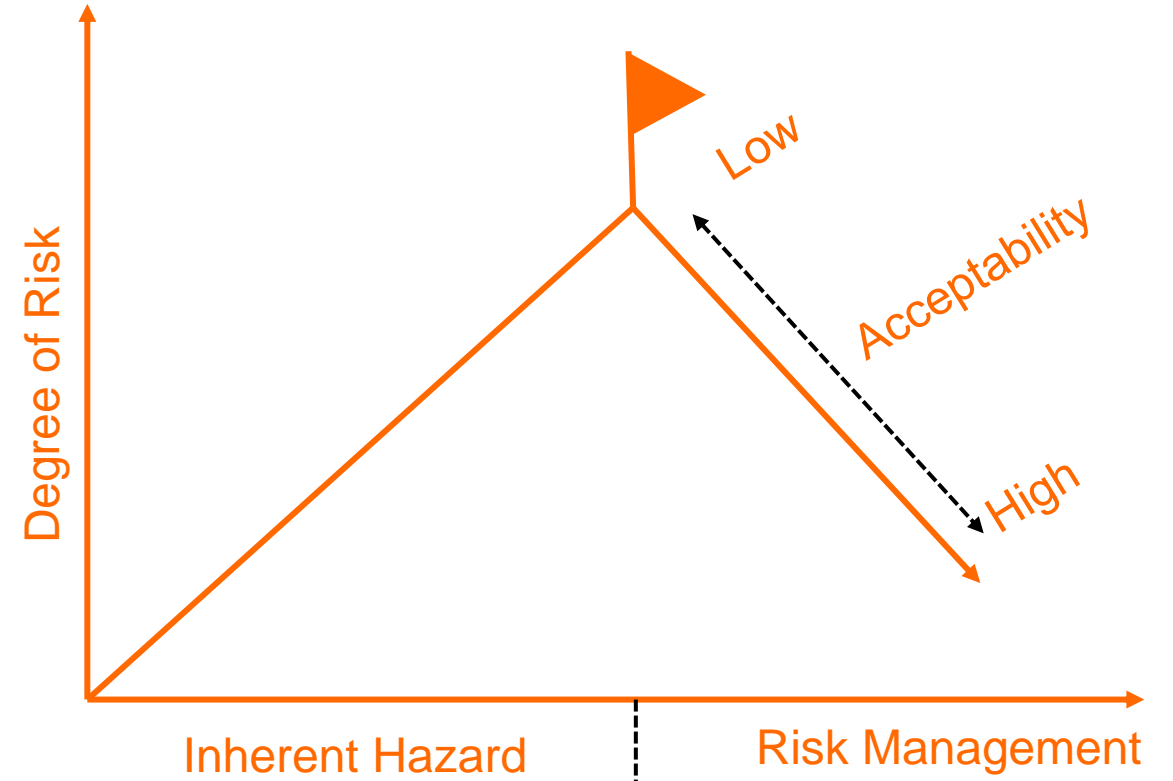
Risk Quality Rating Factors



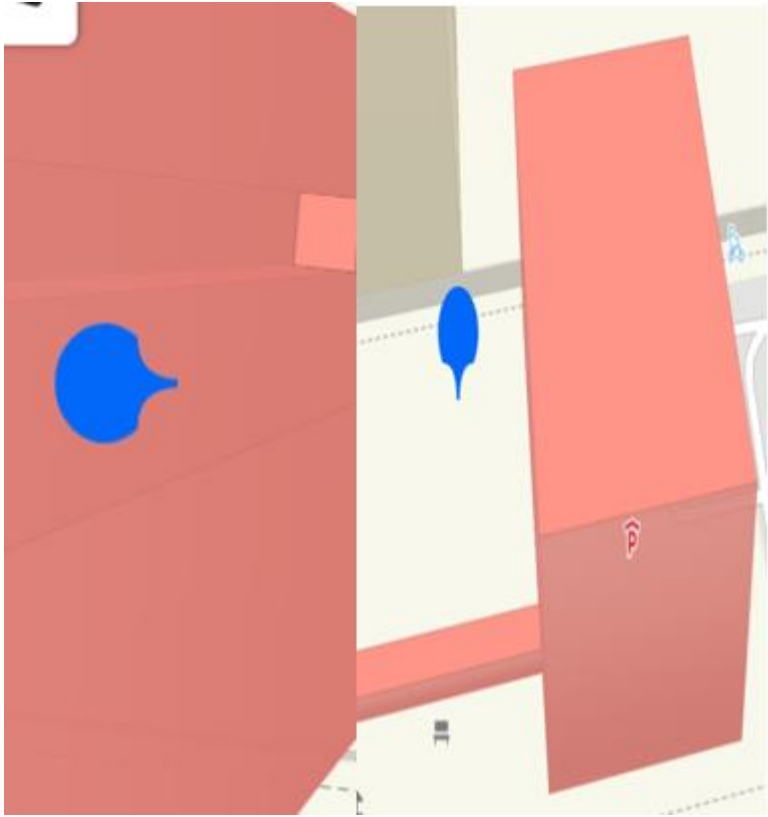
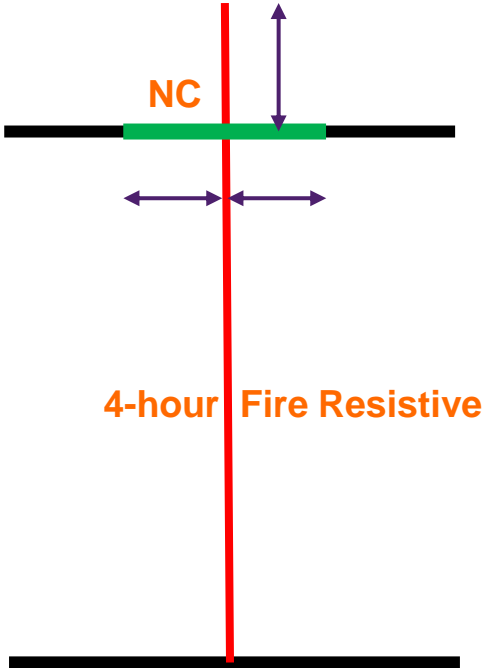
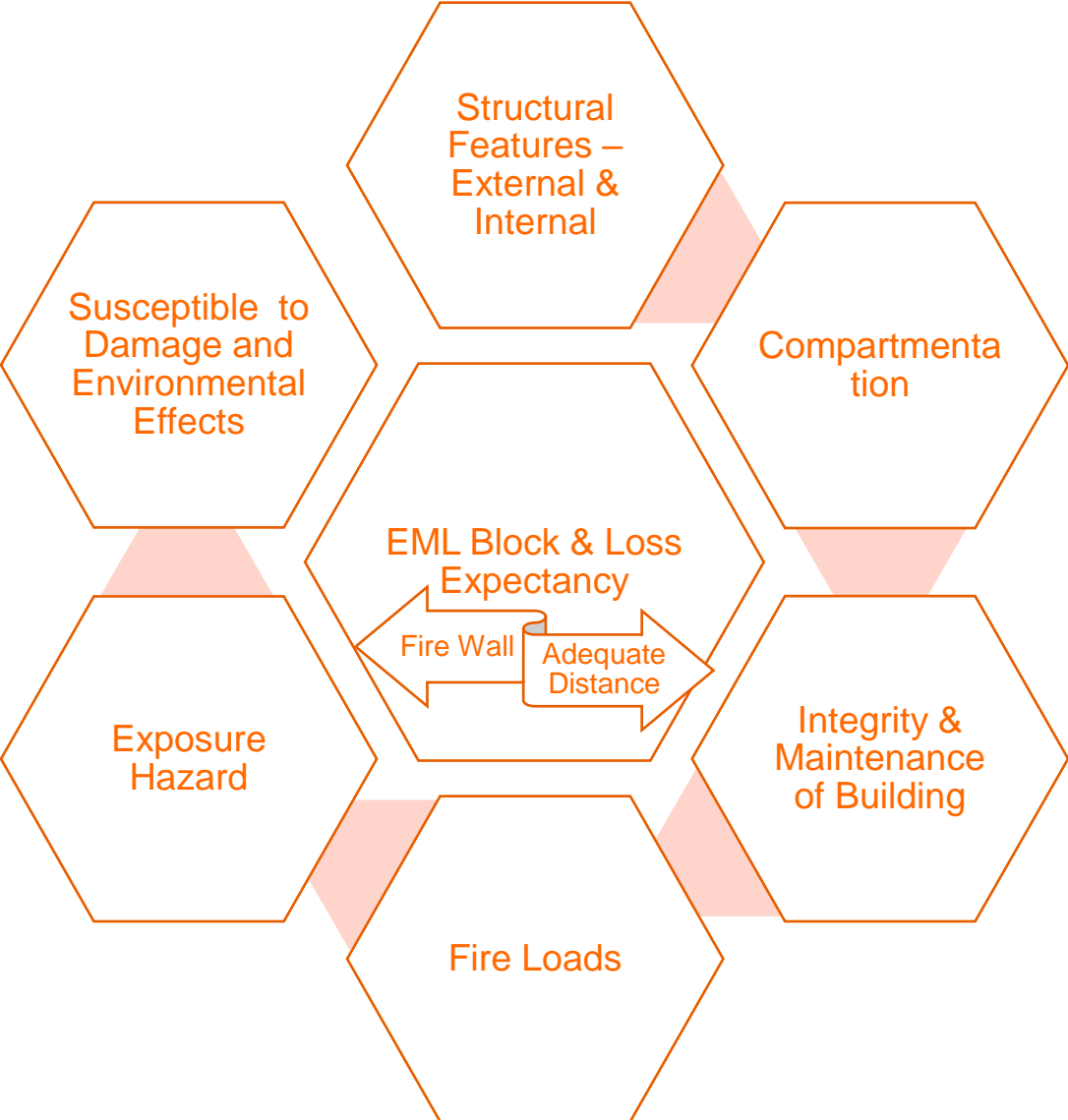
- Overall Construction Fire Classifications
- Occupancy Fire Load Factor
- Compartmentation and/or Separation
- Hazardous process/utilities isolation
- Fire doors & Fire stopping integrity
- Fire protection system ITM
- DLC



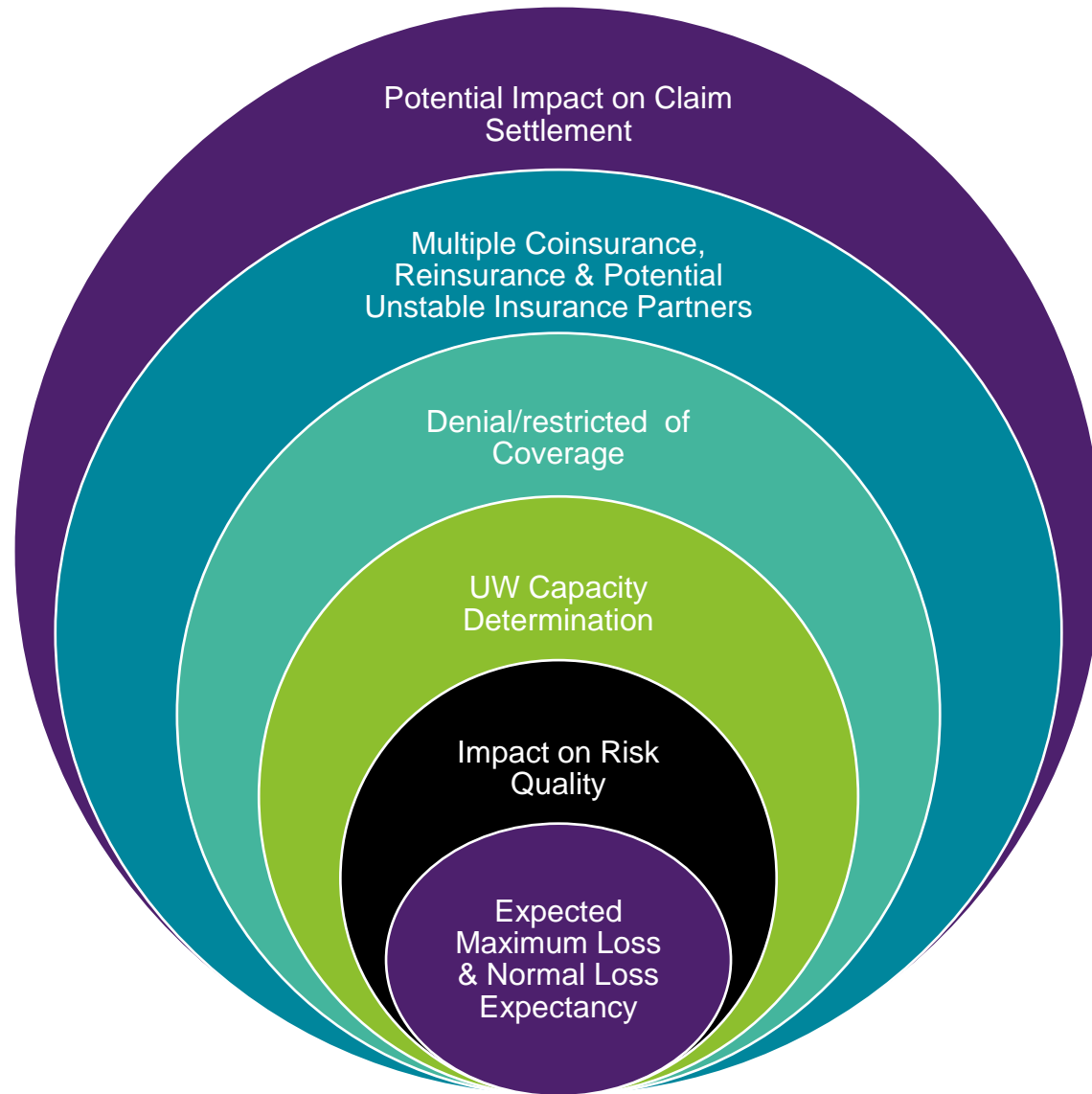
Physical Risk Evaluation Criteria: COPE



PFP & Insurance Loss Modeling



Interconnection between PFP & Claim Settlements



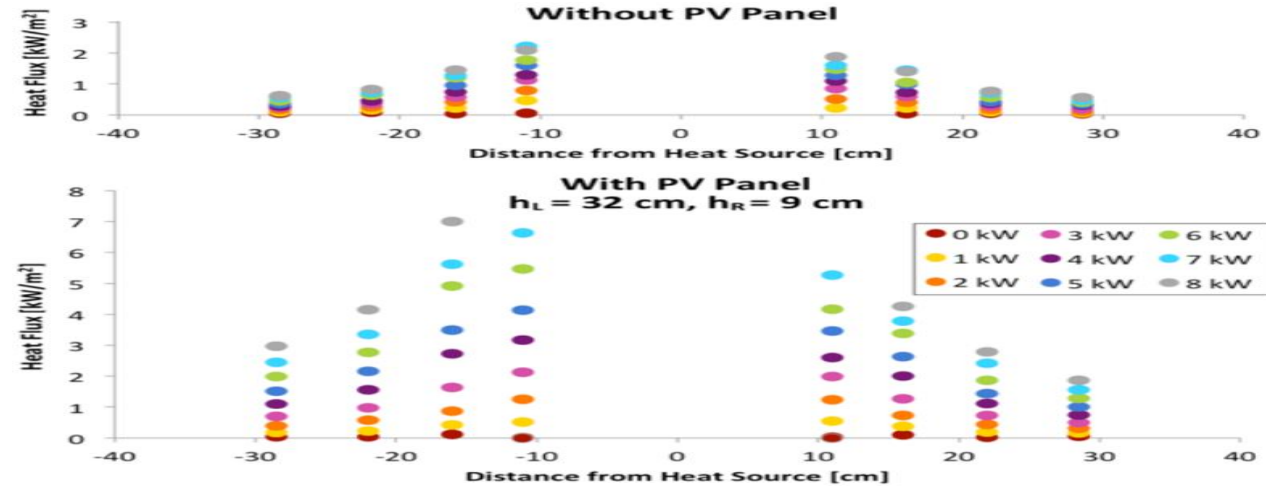
'GOING GREEN' Can Experience Surprising Risks



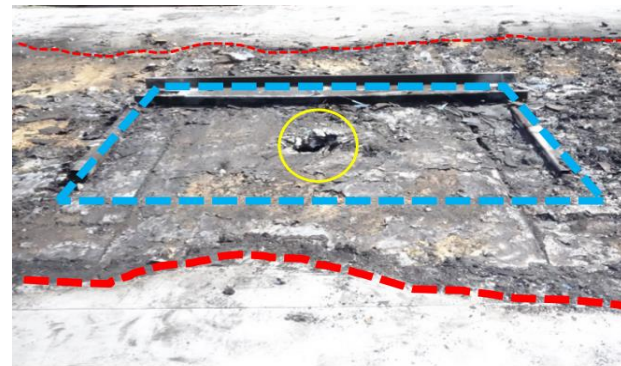
Avoid Installation of PV panels on combustible roofs or roofs with combustible insulation – PU & PIR foam, EPS Sandwich Panels.

University of Edinburgh and the Technical University of Denmark Experiments confirm that:

- Installation of the PV array significantly increased the heat flux received on the Roof.
- Initial fire underneath a PV installation can transform into a hazardous scenario due to the changed fire dynamics of the existing roof
- Combustible construction materials can become fuel loads – High Severity
- Wind speed and air gap size could affect the development of fires.



Each colored dot defines a HRR and the gas burner is placed at the distance of 0 cm from the heat source.



Yellow circle: Penetrated PIR insulation at the point of ignition



Yellow circle: Point of ignition without penetration of the mineral wool.

PV Panel Fire Testing



Fire Performance: UL 1703 & UL 790

- Spread-of-flame test
- Burning brand test

FM 4476 -Flexible Photovoltaic Modules

FM 4478 - Rigid Photovoltaic Modules

- Combustibility from above the roof deck: ASTM E108
- Wind uplift resistance
- Hail damage resistance: FM 4470 & ANSI/Approval Standard 4473
- Electrical safety: IEC/EN 61730.
- Electrical performance: IEC/EN 61646 & IEC/EN 61215
- Seismic resistance: FM 4478
- Windborne debris resistance, Compatibility & long-term impact



Spread of flame test



Burning brand test - UL 1703 (Pre2013)

Common Non-complying PFP System



The Human Factor

A written policy, an individual in charge & ERT, education and training of employees, and a periodic review of the program.

Well-designed

Documented

Formal

Inspection, Testing & Maintenance Program by Certified & Competent Maintenance Team

5.4. Inspection and Maintenance

- 5.4.1.** The building owner, his appointed representative and the facility management shall be responsible to ensure that all the Fire Protection Systems in the facility are inspected regularly, maintained and repaired to serve their intended purpose during emergencies.



2.3. Owner's Responsibilities

2.3.1. Owner shall perform his responsibilities as per Table 18.1.

Table 18.1: Owner's Responsibilities

ITEMS	REQUIREMENTS
1. OWNER'S REPRESENTATIVE	<ul style="list-style-type: none"> i. Owner shall be responsible for nominating his representative to deliver owner's duties, as required by this section. Personnel having knowledge of Fire and Life safety, UAE Fire and Life Safety Code of Practice requirements will be an immense advantage to the owner. ii. Evaluation of owner's representative's qualification, capability and commitment shall be owner's responsibility and owner shall ensure that the represented personnel or the organization truly epitomizes of his own intentions. iii. Where owner has appointed his representative, the term "Owner" in this section shall also mean "Owner's representative".
2. CONTRACTS	<ul style="list-style-type: none"> i. Owner shall ensure and be responsible to include in his legal contract documents with Insurance companies, Developers, Architects, Consultants, Contractors, Manufacturers, Suppliers, Professionals and Facility management companies that <u>"Fire and Life Safety Requirements from Civil Defence shall be strictly followed as per latest edition of UAE Fire and Life Safety Code of Practice, and other rules and regulations from Civil Defence."</u> ii. It is owner's responsibility to evaluate Consultant, House of Expertise, contractor, Décor contractors, manufacturer, supplier, testing laboratories and certification body's qualification and valid approval from Civil Defence, before awarding any contracts and making any agreement with them. iii. It is owner's responsibility to ensure that contract documents clearly state that <u>"All materials relevant to Fire and Life Safety, shall be approved and listed by individual Emirates' Civil Defence."</u>

10. INSPECTION AND MAINTENANCE

1. ANNUAL MAINTENANCE CONTRACT

- i. Owner shall be responsible to appoint a Civil Defence approved and listed maintenance contractor, immediately upon commissioning to periodically inspect and maintain the Fire and Life Safety systems of the facility in accordance with Table 18.1.10.2.
- ii. Full record of periodic inspection and maintenance shall be documented and stored in the facility with facility management.
- iii. Up to date inspection stickers shall be placed on equipment and systems to satisfy random inspections from Civil Defence.

The Importance of PFP



The Silent Guardian: Passive Fire Protection (PFP) System



Fire Protection to Insurance Benefits



By prioritizing Passive Fire Protection System, businesses can fortify their buildings against fire hazards, ensure regulatory compliance, and unlock potential insurance-related advantages.



Improve Insurability

PFP measures are viewed more favorably by insurers.



Impact on Insurance Premium Benefit

Comprehensive coverage at competitive rates for buildings with enhanced fire safety features.



Collaboration with Stable Insurance and Reinsurance Companies

Enhanced Assurance & value-added services (risk consulting, loss history learning, training, etc.)



Greater financial protection against a wide range of perils.

Broader coverage for the businesses

Summing It Up...

Insurance: It is a form of risk management, primarily used to hedge against the risk of a contingent or uncertain loss.

- Passive fire protection reduce the likelihood of fire incidents and mitigate the severity of potential losses.
- PFP not just a sound investment – they are essential components of a comprehensive risk management strategy.
- Insurers value proactive risk management practices.
- By investing in passive fire protection, businesses align with insurers' risk mitigation objectives, fostering a mutually beneficial relationship.
- It offer many benefits, ranging from enhanced safety and asset protection to cost savings on insurance premiums.





Thank You

Life's good when you're covered

Presentation Disclaimer

Presentations are intended for educational purposes only and do not replace independent professional judgment.

This is brief presentation. Observations and our comments are not intended to imply, guarantee, ensure or warrant in any way that you are in compliance with any federal, state or local statute, regulation or ordinance. Additionally, our comments do not imply in any way that compliance with these comments or recommendations as stated in this report will eliminate all hazards, risks or exposures or that hazards, risks or exposures not referred to in this report do not exist. Compliance with the comments stated in this report does not relieve you from its obligation to comply with project specifications, design drawings, industry standards or the provisions of any federal, state or local statute, regulation or ordinance.

