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<u>"Fire Spread Liability & Challenges: Practical Strategies for Prosecuting & Defending"</u>

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Fire spread liabilities arise out of catastrophic fires where increased fire damages and risks were avoidable. More than 1,000,000 fires are reported annually, resulting in billions of dollars for property damage and other economic losses, as well as loss of human life and bodily injury. A significant number of these fire losses occur from structure fires.

Numerous parties are interested stakeholders in investigating, responding, remediating, restoring, and regulating the fire scene. These include the liability and property insurers, property owners, tenants, neighbors and adjoining properties, business owners, fire departments, various public authorities, community representatives, media, and other interested parties. The sheer magnitude of the number of catastrophic fires occurring annually and the losses suffered is astounding. It is this fire landscape that spawns countless claims and lawsuits.

Fire-spread liabilities occur where a fire would have been limited in scope to the area of fire origin, but for the failures of building systems, fire suppression, detection and alarm systems, human factors, flammability of materials, inadequate water supplies for fire suppression and firefighting, and other failures. Against this failure mode backdrop is the push-pull between fire-spread liability chasers and defenders.

Essentially, the thread throughout all fire-spread claims is the pivotal question: What exacerbated or enabled a small fire to grow large? This core question raises numerous issues on the adequacy of: structural design, construction and components; building fire stops and separations; ventilation systems; defective or improperly maintained fire, detection and alarm protection equipment; flammable contents and unreasonably dangerous materials; inadequately segregated construction or other combustible materials; fire spread from adjoining properties; fire safety management and staff training; and compliance with building and fire codes, among other causal or contributing factors.

It is important to emphasize that all of these spread inquiries are irrespective of the cause of the fire when determining the fault for the exacerbated fire spread. Foreseeability, *the sine quo non* of negligence, remains the key. Indeed, even if a fire is caused by accident, arson, intentional conduct or a fortuitous act of nature, fire spread liability may exist when a failed fire protection system, life-safety system, building system or structural component, or human error foreseeably allows a fire to cause further and subsequent losses that increased the incipient damages and/or bodily injuries. This is illustrated by when a fire suppression system fails to perform as expected. It is the enhancement of the loss that is the focal point of the fire spread claim.

Note: This general discussion is a quick, overview reference tool and a source of general information. It is not intended, nor should it be considered, the rendition of legal or technical advice.

Thorough investigation is essential for developing reliable, credible findings, and a provable hypothesis, based on facts, reliable methodologies, good science, good documentation and data, and the applicable standards of care. Many potential experts come into possible play for investigating the fire scene to determine whether the fire spread to areas beyond the area of fire origin, and, if so, what were the causal or contributing factors. A qualified fire protection engineer is often valuable for investigating fire suppression and sprinkler systems, detection and alarm systems, smoke/heat/fire detection systems, and structural issues that may have impacted fire/smoke propagation. Other valuable experts include origin and cause, structural engineers, mechanical engineers, electrical engineers, materials, architects, human factors and the like.

There are many important considerations. Undertaking an NFPA 921 compliant investigation is critical. You want your expert to be able to withstand a *Daubert* challenge. The factors leading to the increased fire spread damages must be carefully investigated and considered. Spoliation of evidence needs to be mitigated, where possible. Prompt notice to interested parties and site inspections are critical steps in the investigation journey. At the outset, the investigation should consider to what extent the fire spread is due to acts and/or omissions or failures of design, specification, manufacture, construction, installation, maintenance, inspection, testing, human factors, operations or use, or other factors. Fire spread investigations, like all others, should carefully consider whether applicable codes and standards, including building codes, were deviated. If so, to what extent those deviations caused or contributed to the exacerbated fire spread loss and/or injuries. Need to also consider whether any applicable codes were retroactive.

Below is a practical checklist for investigating, evaluating, developing and strategizing fire- spread claims for prosecuting or defending property damage, business interruption and bodily injury claims. Also attached is a fire spread liability matrix for referencing, without limitation, multiple fire spread variables. The investigation checklist provides some of the important inquiries for three big fire spread buckets: fire sprinkler systems, fire alarm systems and structural building systems.

A. Fire Sprinkler and Alarm Systems

Fire protection systems provide a reliable method for detecting, alarming, containing and controlling fire spread. Such systems include sprinklers, smoke alarms, heat sensors etc. But when such safety systems fail to function as designed and intended, the resulting fire damages may be exacerbated. Many factors often contribute to system failure, including improper selection, specification, design, manufacture, installation, operation and use, maintenance, inspection, testing and the like. As for fire sprinklers, key components comprise sprinkler heads, water supply piping, valves and the like. Wet systems contain water, while dry systems are filled with air until activated, at which time the valve opens with a drop in pressure and allows water to fill the system. Sprinkler heads have faced many recalls. There are obviously numerous Achilles' Heels for system failures.

1. Fire Alarm Systems

Fire detection and alarm systems are vital for providing effective fire protection and reducing the extent of fire damage and risks to human lives. As with all fire protection systems, it is critical to consider whether the applicable system and devices were properly specified, selected, designed, manufactured, installed, operated, maintained, tested and inspected. If any of these critical activities were improper or less than adequate, then the margin of safety for limiting the scope of the fire has been compromised. At the outset, all fire protection systems require some level of risk analysis of the property and the intended fire safety goals (*e.g.*, life/safety, property protection, mission protection) in order to determine the appropriate system to have in place.

Below are some of the relevant failure investigation inquires for fire detection and alarm systems:

a) Was the system code compliant?

b) Was the fire alarm system properly selected and specified for the dedicated environment? Were the fire threats property evaluated?

c) Was the fire alarm system effectively interlocked or connected with other fire protection systems

d) Was the system UL/FM compliant?

e) Was the system installer certified?

f) Was the fire alarm system inspected, tested and maintained at the required frequency intervals?

g) Were primary and secondary power supplies maintained?

h) Did the fire alarm system, if applicable, activate other safety systems, like fire suppression, elevator recall, HVAC controls, closing designated doors, smoke control devices, etc.?

i) Was a central monitoring station notified of the alarm condition? If so, did they respond timely and appropriately?

j) Were the appropriate fire detector devices (heat, smoke or radiant energy) selected and specified?

k) Were the fire detectors properly located, spaced and positioned in the dedicated space?

l) Were the fire detectors properly installed, inspected, tested and maintained?

m) Did the fire notification devices function properly? Were they properly selected, specified, designed manufactured, inspected, tested, maintained and operated?

2. Fire Sprinkler systems

Fire sprinkler systems detect fires and upon activation are designed to control and suppress fires. Numerous failures modes loom for fire sprinkler and alarm systems. Below are some of the relevant failure inquiries:

a) Was the sprinkler system properly specified, designed, manufactured, installed, operated, maintained, tested and inspected?

b) Was the system code compliant?

c) Did the sprinkler system activate timely?

d) Did the heat sensitive devices function?

e) Did the sprinkler system have the necessary spray pattern?

f) Were enough sprinklers in use?

g) Was the type of sprinkler specified appropriate for the identified fire risks for the space?

h) Adequate water supply provided?

i) Valves function properly?

j) Did the devices (*e.g.*, water flow detector, pressure switches, alarms bells) that control and monitor the water flow function properly?

k) Problems with the water pressure?

l) Was the sprinkler system properly maintained, inspected and tested? Identify the entities involved in the system testing, inspection and maintenance. Retrieve all service contracts and records.

m) If a dry pipe sprinkler system exists, were the required compressed air levels maintained? If not, did a valve or pump fail?

n) If a deluge system failed, did the initiating device - like a heat detector – not send a signal to the monitoring panel that would release the circuit to open the solenoid valve?

o) If a pre-action system (computer room type applications) failed, did the detection device not activate that would have opened the pre-action valve?

3. Building Systems

A structure's design, materials used, and manner of construction are all important variables for fire spread. On the one hand, the structural features and components may confine or impede fire spread or, on the other hand, they may exacerbate the growth and spread of fire beyond the original area of origin. Fire confinement is critical to containing fire to the area of fire origin. Inadequate or unprotected openings or penetrations are frequent spread pathways. Other structural component spread pathways include fire doors that fail to close, inadequate compartmentation, defective or inadequate fire resistance assemblies (walls/ceilings), HVAC systems that continue to operate during a fire, failed dampers, windows, and other structural components. Building materials also affect fire spread. The types of materials used in building interiors can greatly increase the fire load, like plastics and synthetic materials.

Below are some relevant inquires in investigating the structure and its components for their impact on fire growth and spread:

a) Were fire resistance barriers properly specified and selected?

b) Were fire resistance barriers properly constructed and installed? Were they maintained?

c) Were any fire rated barriers breached during the fire? If so, to what extent did the fire spread through the barrier?

d) Did the fire resistance barriers contain any openings that were unprotected?

e) Did the combustibility of the interior finishes and materials contribute to the fire growth and spread?

f) Investigate the type and extent of combustibles in the fire area. g)

Were openings to concealed spaces adequately fire-stopped?

h) Did the fire spread through open doorways?

i) Did the fire spread through open stairwells or shafts?

j) Did the fire spread externally?

k) Did the structure's external design contribute to vertical spread?

l) Were the glass panes properly installed and rated?

m) Did any building fire protection features degrade over time?

n) Were combustible materials improperly stored or segregated in the structure?

o) Did the insulation (like plastic) on electrical cables contribute to the fire spread?

p) Were vertical openings (*e.g.*, air shafts, elevator shafts, stairwells) enclosed with adequate fire rated walls and fire-stops?

q) Were spaces in the structure containing increased combustible hazards adequately segregated?

r) Did the corridors contain adequate fire rated partitions and walls?

s) Did a combustible roof contain adequate parapets to mitigate fire spread?

t) Did any fire doors fail to close upon activation? If so, were the doors properly installed?

u) Were the appropriate fire doors selected and specified for the space?

Selected References: Standards and Guidelines

- NFRA 13: Standard for Installation of Sprinkler Systems
- NFPA 25: Standard for the Inspection, Testing and Maintenance of water – Based Fire Protection
- NFPA 72: National Fire Alarm Code
- NFPA 80: Standard for Fire Doors and Other Opening Protective
- NFPA 80A, Recommended Practice for Protection of Buildings from Exterior Fire Exposures
- NFPA 101: Life Safety Code
- NFPA 221: Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls
- NFPA 5000: Building Construction and Safety Code
- The International Building Code and International Fire Code/International Code Council

FIRE SPREAD LIABILITY MATRIX

Component/ Construction Feature	Specification/ Application LTA	Design LTA	Installation LTA	Inspection LTA	Testing LTA	Maintenance LTA	Training LTA	Operation LTA	Human Factors/ Response LTA	Other Factors LTA
Construction Materials (Combustibilty/ Fire Resistance)										
Finish Materials (Combustibility/ Smoke Development)										
Fire Containment (Fire Resistance)										
Fire Suppression Systems										
Fire Detection Systems										
Fire Alarm, Notification & Monitoring										
Building Systems										
Process Systems										
Utilities										
Other Systems										

** LTA (less than adequate)*