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Investigating a Modern Accident Analysis Model for Textile Building Fires through Numerical Reconstruction

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Abstract : Fire investigations face challenges due to the complexity of fire development, and real-world accidents lack repeatability, making it difficult to apply standardized approaches. The unpredictable nature of fires and the unique conditions of each incident contribute to the complexity, requiring innovative methods and tools for effective analysis and reconstruction. This study proposes to provide the modern accident analysis model through numerical reconstruction for fire investigation in textile buildings. This method employs computer simulation to enhance the overall effectiveness of textile-building investigations. The materials and evidence collected from past incidents reconstruct fire occurrences, progressions, and catastrophic processes. The approach is demonstrated through a case study involving a tragic textile factory fire in Karachi, Pakistan, which claimed 257 lives. The reconstruction method proves invaluable for determining fire origins, assessing losses, establishing accountability, and, significantly, providing preventive insights for complex fire incidents.

Keywords : fire investigation, numerical simulation, fire safety, fire incident, textile building
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