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STUDY ON RISK ASSESSMENT MODELS FOR QUANTIFYING LIFE SAFETY IN BUILDINGS IN CASE OF FIRE

Abstract

Risk assessments have been extensively used to quantify life safety in a building in case of fire. In the last decade, the solely deterministic risk assessment approach is shifting to a broader risk-informed frameworks. The complication of this development lies in the integration of the probabilistic approach in current models. In current models, there are several sub-models evaluated. The risk model results are influenced by the sub-models modelling method, interactions and selection of input parameters value. The aim of this thesis is to investigate how the sub-models system work with the introduction of inputs distribution. An extensive literature study on previous risk assessment models has been carried out. From this, a general risk assessment framework is developed with the integration of input probability distributions stemmed from statistic data. The general framework gives flexibility to the users to select the suitable methods based on their intentions and resources availability. As an additional aid to choose the appropriate methods, selection criteria are defined. This way the most optimal combination of methods can be selected to estimate the risk outcome. The application of the framework proposed is demonstrated through a simple case study of an office building. The risk outcome is measured as fatalities per year per building.