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Computer Simulation of Fire Dynamic Behavior for A Typical Commercial Basement

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Summary

It is a common practice that most underground basements of buildings are utilized/developed for commercial purposes/stores in Taiwan. Many basement fires occurred and caused tremendous losses of human lives and properties in the past twenty years. Therefore protecting against basement fires in commercial buildings is of important concern in Taiwan. Smoke gases from a basement building fire might spread through corridors and ventilation systems to the entire building. This study utilizes Fire Dynamics Simulator (FDS) software to develop a computer simulation model for investigating a typical basement barbershop fire that occurred in 1993. The fire accident eventually/ unfortunately caused a huge property loss and heavy casualties (22 died and 7 were injured). The important influence parameters, including thermal property (heat of vaporization) of room partition material and opening sizes of the first floor room ceiling, on fire dynamics are carefully evaluated/ analyzed. The simulation results reasonably agree with post-accident reports. The numerical data obtained might be utilized to improve the better/safer designs for basement building fire protection capability.

keywords: Flashover, Field Model, Computer Simulation, Fire Dynamics

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