

Withayavuth Jirasingha 2010: A Numerical Study of Fire Evacuation Out of the Library Building of Kasetsart University, Si Racha Campus. Master of Engineering (Fire Protection Engineering), Major Field: Fire Protection Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Mr. Supat Patvichaichote, D. Eng. 195 pages.

This thesis presents a numerical study of fire evacuation out of the library building of the Sriracha Campus of Kasetsart University by using Fire Dynamics Simulator with Evacuation (FDS+Evac) program. The study attempts to simulate an evacuation due to a burning fire in the main library building. The library building is 15.3 meters high and has four floors with a total building dimension of 22.8 meters by 54.8 meters. The first floor is 3.6 meters high while the second, third, and fourth floors are all 2.7 meters high. The library building has two stairwells on both ends. The first floor has only one exit in the center of the building. The library building has a sprinkler system, but this study assumes it isn't activated in the worst case. This simulation is divided into four cases: the first case is characterized by 517 people with a heat release rate of 5 MW, the second case is characterized by 517 people with a heat release rate of 7 MW, the third case is characterized by 788 people with a heat release rate of 5 MW, and the final case is characterized by 788 people with a heat release rate of 7 MW.

This study shows that the first case and the second case have evacuation time of 8.63 minutes and 8.81 minutes in which people didn't die. The third case and the final case have evacuation time of 18.17 minutes and 18.83 minutes in which 1 person and 18 persons died, respectively. The experiment concludes that the immigrant is directly impacted by the number of immigrants and the size of the burning source due to the congestion of immigrants and the large toxic quantities. Therefore, stairwell on the right side should be improved and used as a fire exit to increase an evacuation capacity.

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Student's signature

Thesis Advisor's signature