

Teeranon Saelao 2011: A Study of Fire Evacuation in Student Dormitory at Kasetsart University, Si Racha Campus by Numerical Method. Master of Engineering (Fire Protection Engineering), Major Field: Fire Protection Engineering, Faculty of Engineering. Thesis Advisor: Mr. Suphattharachai Chomphan, D.Eng. 94 pages.

This thesis presents a numerical study of fire evacuation at the student dormitory of Kasetsart University, Si Racha campus, by using Fire Dynamics Simulator with Evacuation (FDS+Evac) program. The study attempts to simulate an evacuation of fire situation at the main student dormitory building. The fire storey student dormitory building is 16.21 meters high with the total building dimension, of 28.4 meters by 50 meters. All floors are 2.9 meters high, The building has two stairwells at both ends, however, the first floor has only one exit end. Moreover, the sprinkler system has not been installed in the building, while it is opened in the middle area. This simulation is divided into four cases: the first case has 1 meter exit door, the second case has also 1-meter exit door with a smoke curtain in the beam before the stairs, the third case assumes that the size doors, 2 m and has 2-meter exit door, and the final case uses 2-meter exit door with a smock curtain in the beam before the stairs. The immigrants and the a heat release rate as well as 4 cases at characterized by 480 people and 7 mw.

This study shows that the exit door size effects on the evacuation, the first case and the second case have evacuation time of 460 second and 465 second. The third case and the final case have evacuation time of 270 second and 265 second, respectively. The difference of evacuation time between two size doors are 200 seconds. During to waiting in the exit door, a measurement of the amount of oxygen and carbon monoxide is conducted. The results showed that the amount of carbon monoxide affects the migration of the case 1 and case 3 where there is the smock curtain . The amount of smoke are higher for case 3 and case 4, where the smock curtain exits. However, the amount of the gas is not dangerous for life, but it is a barrier to evacuation. Therefore, it has been concluded that to improve the evacuation performance, the door size should be increased, while the smock curtain should also installed.

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Thesis Advisor's signature