

Sangduan Khurukitkamchorn 2009: The Study of Classroom Evacuation by Fire Dynamics Simulation and Evacuation Program. Master of Engineering (Safety Engineering),
Major Field: Safety Engineering, Interdisciplinary Graduate Program. Thesis Advisor:
Associate Professor Saree Svaesaranee, D.Eng. 118 pages.

This thesis is mainly about the evacuation of the people on the fifth floor of the building of Chemical Engineering Department, Faculty of Engineering, Kasetsart University which was simulated and analyzed by using Fire Dynamic Simulation Program, FDS 5.2.0 and Smoke view 5.2.2. with three main variations affecting the evacuation which are fire position, number of evacuees and width of door. The maximum capacity of the people on the fifth floor was 426. In case that the size of the fire source was similar, and the fire start from room 1509, 1516 and 1517 the percentage of the people who cannot escape from the floor in the restricted 3 minutes were 10.0%, 21.6% and 19.7 % respectively. The people on the floor would be more critical if the fire source starts from the dead end side compare to other location. If the number of evacuees is 200, 300 and 400 and assume that the fire starts from the same place, it was found that the percentage of people who were unable to evacuate within 3 minutes were 2.4%, 4.5% and 20.7% respectively. It means that the more people on the floor, the more number of victims would be occurred. Moreover, if the width of the exit door is 0.9, 1.2 and 1.5 meters, the results shown that the percentage of people who were unable to evacuate within 3 minutes are 21.6%, 21.1% and 20.9% respectively. As a result, the wider the exit door becomes, the number of people would be able to evacuate will increase. So, from the results of the simulation with the 3 assumed variations, the residents cannot evacuate within 3 minutes and cannot meet the NFPA requirements and the victims would be found at the dead end area.

It was found that the design of mean of egress for the fifth floor does not comply with the Engineering Institute of Thailand standard and the simulation results shown the victims percentage was 21.6%. So, the researcher proposed the new design of the fire escape. The results of the simulation using the new design by adding a new corridor and a new fire exit door shown the total number of the fatality decreased to 2.1% and 15.0% respectively. Especially, new corridor that reduced the dead end distance because the evacuees can choose the nearest mean of egress with the fire stair and far from away the fire source. However, the number of the student on the floor shall be restricted along with the upgraded fire exit which will surely help the residents avoid taking risk from the fire evacuation from the building.

Student's signature

Thesis Advisor's signature

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