

Wichai Sukliwanat, Squadron Leader 2011: Study and Analysis for Fire Protection System in Extra Large Building Case Study: Khumklao Building, Bhumibol Adulyadej Hospital. Master of Engineering (Fire Protection Engineering), Major Field: Fire Protection Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Assistant Professor Apichart Changbamrung, Ph.D. 124 pages.

This research has examined, analyzed, and proposed fire safety measure for extra large-sized buildings by selecting Khumklao Building, Bhumibol Adulyadej Hospital as a case study. It is one of the buildings located in Royal Thai Air Force and used to provide the medical treatment for people and Royal Thai Air Force officials. The research has been conducted by examining the building and the standard of equipments used in fire prevention according to the Fire Prevention Standards of Engineering Institute of Thailand under H.M. the King's Patronage. Furthermore, the obtained data has been analyzed to identify the risk from conflagration. Consequently, this research has proposed the standard measures for fire prevention including calculate time spent for evacuating people to the safety area in case of fire occurrence. In addition, the fire evacuation plan for Khumklao Building has been established in order to protect the lives and the governmental properties.

The study has indicated that the fire safety measures of Khumklao Building are inappropriate according to the Fire Prevention Standards of Engineering Institute of Thailand. Since the building is occupied for a long time, most of the fire alarm systems, for example water-based fire protection system, automatic fire alarm system are damaged and not properly working due to lacking of appropriate maintenance,. In relation to fire extinguisher room, the actual quantities of carbon dioxide - suppression agent used by injection into the engine and reserved oil tank are 250 and 120 Kilograms, respectively. Compare to the amount from calculation, 739 and 597 Kilograms, those quantities are not sufficient for fire suppression. Besides, in the electrical control room, the quantity of HFC-227ea is 68 kilograms lower than the quantity from calculation at 162 kilograms and also not sufficient for safety management. The research has also indicated that the size of pressurized fan used in fire escape should be at least 11,436 cfm. From the fire escapes within the hospital, some barriers were found being the problem for patient evacuation.

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Thesis Advisor's signature