An Operational Crowd Management Process In Industrialised Building System (IBS) Commercial Building

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Article history:
Received 25 September 2014
Received in revised form 26 October 2014
Accepted 25 November 2014
Available online 31 December 2014

Keywords:
Crowd Management, Industrialised Building System (IBS); Commercial Building, Fire Safety, Building Design and Management.

ABSTRACT

In our daily life, everyone is exposed to the risk of fire. This is because each people need fire as one of the main source of energy, from cooking to lighting up cigarettes. There are many cause of fire and it might get worse if there is no precaution been taken. Therefore it is vital for us to take precaution acts to prevent or at least to reduce the risk of fire. One of the prevention methods is known as crowd management. It is crucial for us to have a very good crowd management in assembly occupancies such as hotels, cinemas and apartments as well. The main idea in crowd management is that how you direct the building occupants in a building into a smooth flow from the affected area to the safe area. Crowd management consists of two major areas which are human psychology and also design involving fire safety in building. Human psychology will involves with human behaviors in fire and the factors that influence them to behave such alike. Designs involving fire safety are mainly focused on the specific area in the building, emergency exit and also fire safety system. This paperwork will discuss the importance of crowd management in IBS buildings in order to save many of innocent lives during fire outbreak or in other emergencies. It is also hoped that all the building management or the person in charge of the building will take proactive actions towards making the building is a safer place to stay.

INTRODUCTION

How people behave in fire situation have a big correlation with their role, previous experience, education, personality, means of egress provided and also the action taken by the people who shared the same situation. Post event analysis done by researches identified that human behavior in fire situation could be categorized as adaptive, no adaptive, inhibited, altruistic and individualistic. But yet, it is must keep in mind that action taken by people in fire situation are more influenced by variables in the respective building and also the fire condition when it was first detected. Human reaction will be differ from those who smells smoke from burning materials to those who see flames or black thick smoke moving fast through the corridor. Fire safety elements provided in the respective building or room can also be a factor in giving a picture to the building occupant the type and the level of risk that they might have to face with in case of fire.

Actually, the vital time for someone to make decision and taking early action in fire emergency is the time between the fire is first detected and before the fire brigade arrive to the site. Therefore, the first action taken by the person not only will affect himself but also to others as well. Post event analysis also shown that human always be altruistic to each other when it comes to emergency situation especially fire. No adaptive action or can be simplified as panic actually is less recorded and can categorized as unusual action taken by people in fire situation.

Understandings about human behavior in fire situation are essential especially to the building designers to come up with a design which are safer and easy to manage in term of fire safety [1]. A safer design in term of fire safety refers to reduce or minimizing the loss of human lives and also the loss of belongings during fire [2].

Unfortunately, there is a lack of appropriate guidance for Malaysian construction practitioners on how to understand and prevent or at least to reduce the risk of fire in the IBS commercial building. As highlighted above, one of the prevention methods is known as crowd management which it is crucial for the user or industry.
players to have a very good crowd management in assembly occupancies such as cinemas and shopping complex.

**Definition and Categories of Industrialised Building System (IBS):**

Generally, IBS (also known as offsite manufacturing in the UK construction industry) is defined from two perspectives, namely, system and process of construction [3, 4] classified IBS as “a system in which concrete components prefabricated at sites or in factories are assembled to form structures under strict quality control and minimum in situ construction activity while [5] explained that this industrialization process is essentially an organizational process continuity of production implying a steady flow of demand; standardization; integration of the different stages of the whole production process; a high degree of organization of work; mechanization to replace human labour wherever possible; and where research and organized experimentation are integrated with production[4]-[6]. Numerous studies [7]-[11] showed that implementation of IBS offers a significant number of benefits to adopters such as productivity, quality improvement, less wastage, time and workers reduction

According to the [12], there are five main categories of IBS; Pre-cast Concrete Framing, Panel, and Box Systems; Steel Formwork Systems; Steel Frame System; Prefabricated Timber Framing Systems; and Block Work System.

**Crowd Management in Term of Fire Safety:**

Crowd management refers to an effort taken on how to direct all the building occupants to out from the respective building through a safer and better manner (means of egress) and nonetheless, in a much shorter time. Fire safe is defined as the means or action of safety (human and equipment) provided for specified occupancy (areas and functions) or situation to work against potential fire hazard or danger during any emergency in order to minimize the level of risk.

Hence, it is understood that crowd management in term of fire safety is the combination of the means of egress by using any fire safety systems in order to ensure the life safety of the building occupant during the evacuation process until they are out from the building or away from the affected area without consuming too much time.

Crowd management in term of fire safety is categorized into two main parts. The first part is on the human behaviors in fire discussing the actual action taken by the people who faced fire situation. Understandings on the behaviors are vital in giving us the real picture during the event of fire. Furthermore, it will help the fire engineers and also the building design to implement a better fire protection systems and a better building design which will not harm the building occupant during emergencies especially fire.

The second part of crowd management in term of fire safety discussing about the typical fire protection systems used in most buildings. It also touched on the related standards and code of practice required. Fire protection systems will ensure the life safety of the building occupant especially while they are still inside the building. A good fire protection system will direct the building occupant with a smooth flow to outside the building safer and faster.

**Human Behaviors in Fire:**

There is no other research related to human behavior which had brought much attention rather than human behaviors in fire. Most such research focused more on how the surroundings and social affect the human behaviors but yet, our understandings on how the individual process the information from his social and physical surroundings in fire situation is still limited. However, the picture on what action that human tend to do or not to do in fire emergency are getting clearer and clearer.

**Fire Prevention System:**

Fire Prevention System in building is very essential in order to ensure fire could be prevented from the early stage and also controlling it from spreading to the others parts of the building. Fire Prevention System could also could describe as a temporary defense system against fire while waiting for the fire brigade to arrive. Fire Prevention System is differing from one building to another depending on the type, size and the function of the building. However in the context of crowd management especially in buildings where there are people inside the building (living, working, patrons, etc), the requirements are still the same such as exit doors, staircases, exit routes and related fire systems are still the same. It is just maybe that the size and the numbers of fire appliances are different based on the condition of the building. Installation of the Fire Prevention System Devices must comply with the requirements by the Fire Brigade and most importantly by the Building By-Laws 1984 [13]-[14]. Fire Prevention System can be divided into Passive and Active Fire Control.

**Conclusion:**

An effective crowd management depends on a proper amenities or elements related to the means of egress in buildings. Many death cases in the event of fire have been caused by the lack of the elements. Understandings
on human behavior in emergency situation especially in fire situation will help us to provide a better amenities and better emergency plans in the event of fire. Appropriate maintenance work must be done to ensure all systems always in a top performance. Training and knowledge about fire should be given not only to the building staff only but also to the patrons in the building directly or indirectly such as fire drills in order to make sure that people are always alert to their surroundings. Last but not least, building owners should be implemented a good crowd management in their premises. People will develop their trust and confidence because they feel safe inside the building thus giving a good impression to the organization.

REFERENCES