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AN ASSESSMENT OF BUILDING SECURITY SYSTEM AND ACTIVE FIRE PROTECTION SYSTEM IN ADMINISTRATIVE BUILDING

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ABSTRACT: *This paper presents the assessment of building security system and active fire protection system in administration building. Building is a structure that gives protection to human. A building needs to protect human from extreme weather and danger created by human. Apart from giving us protection; building gives us privacy as well. Our generation is different from the previous generations. The environment is now more dangerous than the past. People can get hurt or killed even in the house. Other than building security system, an active fire protection system is also crucial to ensure that the occupants in the building are protected adequately against fire. Fire can spread to a wide area in seconds if we do not have fire protection system to prevent the fire from spreading. Administration building is a building accommodating ten to hundreds of people. It needs a proper security system to monitor and control the flow of people. Vandalism and burglary can happen easily without a proper and effective security system. Besides that, since an administration building accommodates many people, therefore, its active fire protection system needs to comply with Uniform Building By-Law (UBBL) of Malaysia.*
KEYWORDS: *building security system, administration building, active fire protection system*

INTRODUCTION

Building is very important to human. Almost all of our activities cannot be done without a building. Students need lecture halls, doctors need hospitals. A building is a shelter, giving protection from the extreme environment, and danger from others. There are many types of building and every building has its own function. A house accommodates family members, a hospital houses medical staff and patients, office is used for administration work, and a factory is used for manufacturing. Administrative building functions as a space where officers and staff manage their daily administration work. Depending on its size, it accommodates from a few officers to hundreds of officers.

In order to prevent inconvenience and interruption from unwanted incidents such as burglary and fire, the building must have a building security system and fire protection system. Building security system is also important to ensure that the assets and corporate secrets are well protected by preventing or discovering employee theft [1]. Access control, for example, is to control the people who enter the building and to monitor when and why they did. This way, the building and the people inside are better protected. Hospitals need strong fire protection systems. If the security of the external environment is weak, this may attract intruders. Therefore, buildings should have fences, gates, doors and security guards to filter people who access the buildings.

The administration building that is used as the case study is Eureka building in USM and Malaysian Institute of Pharmaceuticals and Nutraceuticals (IPharm). Eureka building is commercial arm of Universiti Sains Malaysia and IPharm is the multidisciplinary research institute that focuses its efforts on drug discovery. Administration building is often the target for break-ins. This may be due to the assumption that small businesses and or small office buildings are not adequately secure [2]. Therefore, criminals believe it will be easier to break in without tripping alarms or encountering guards. Therefore, it is the responsibility of the owner to provide security to employees and assets of the business. Besides that, fire is extremely dangerous especially in buildings that have inadequate, or poorly maintained active fire safety system [3]. A fire outbreak, although restricted to a single compartment of a tall building, can prove to be deadly to people in the whole building.

METHODOLOGY

There are few steps to conduct this assessment. First, is to obtain the permission from the building owner or representatives. After obtaining their permission, observation is carried out at administrative buildings namely Eureka and IPharm buildings. The building security and active fire protection elements are observed and recorded using cameras and building plans. The quantity and operation of fire protection and building security are tabulated in this thesis. A part of the technical procedures used to classify the quantity active fire protection components is also tabulated. Some of the data comes from respondents who are managing the buildings. The data is very important in order for the researchers to identify the types and functions of building security system and active fire protection system.

OBSERVATION, RESULT AND DISCUSSION. Building Security System

Both buildings are being observed from several building security's elements such as intrusion detection, perimeter control, access control and lighting system.

i. Access Control

Access control is a system in which the visitors press a buzzer in order to identify him/ her. The lock will then be released via the electric striker or by an electric lock

Access control in Eureka is card reader access system. The sensor card needs to be placed at the card reader in order to deactivate the magnet at the door so the door will open. The access key card is only available at the main door. USM has guard house that monitors the flow of visitors. While the access control in IPharm is a biometric and access card control, the guards in IPharm are doing their job well. All the staffs need to have their access cards to pass through the guard house. As for visitors who want to visit the building they have to register at the guard house. On top of that, the guard house even has CCTV to monitor the traffic of people.

ii. Lighting System

Lighting system is the principal requirement of the lighting for safety and security has sufficient intensity whether in the day and night. With sufficient lighting, the chances of spotting burglary-in-progress will be higher because bright security lighting allows the guard to observe movements on the ground. The type of lighting system used in Eureka building is fluorescent. There are no security lightings in this building. The type of lighting system they use is cove lighting. IPharm does not use any security lighting system as well.

iii. Perimeter Control

Walls and fencing are the few elements that control human access. This is under perimeter control. Eureka building does not have any fences or wall systems to control the perimeter. This is because Eureka is situated within USM. It is already governed by the security and perimeter control of USM. IPharm has proper perimeter control system to control the flow of people. The fences are well maintained. It is a chain link type fence. This is a common type of fence used for security protection.

iv. Intrusion Detection

Intrusion detection is a device that monitors network or system for violent activities and produces reports to a Management Station. This system performs intrusion detection and attempts to stop possible incidents. It focuses on indentifying possible incidents, logging information about them, attempting to stop them, and reporting to the security administrators. There are no other intrusion detection methods except for CCTVs in Eureka building. The management of Eureka only installed CCTV on the ground floor while other offices install CCTVs according to their own financial capacity. So, some areas are installed with CCTVs while some areas are not installed with any. Pan tilts zoom and speed dome are the type CCTVs that installed in Eureka building. IPharm is also installing the same type CCTVs with Eureka. Speed dome is installed in IPharm while PTZ is installed outside the building, at the guard house. There are no other types of intrusion detections installed in IPharm except CCTV.

Active Fire Protection System

Active fire protection system that are being observed is fire extinguisher, sprinkler system, smoke detection, pressurized escape routes, hose reel, external hydrant, alarm system and emergency lighting.

i. Fire extingisher

Fire extinguisher is an extinguishing agent. Eureka building uses dry chemical extinguishing agent. Dry chemicals usually use a mix of monoammonium phosphate and ammonium sulfate. It insulates class A fire by melting at approximately 350-400°C. The powder breaks the chain reaction of class B fire by removing oxygen from the area and prevents vapour from reaching the explosion source. IPharm uses two types of fire extinguishers which are dry powder and carbon dioxide suppression system. The formation of the fog is due to discharging of gases in the protected area due to drastic lowering of the temperature to the dew point. It is stored in strong steel, pressure resistant tanks. The system is activated by the smoke and heat detectors.

ii. Sprinkler system

Eureka does not install any sprinkler system. IPharm uses a sprinkler system which is activated through the glass bulb. The soldering will melt and release the water. The liquid contents in the glass bulb will expand gradually when temperature increases and would burst upon the pre-set point, thus releasing the valve and water to the area.

iii. Smoke detection

Smoke detection is a detection system that alerts and warns the building occupants of the occurrence of a fire, thus providing them an early warning to escape from the building. There are many smoke detectors installed in Eureka because Eureka does not install any sprinkler system. Smoke detection can help to give the first indication to the occupants inside if there is fire. There are smoke detectors installed in the offices too. IPharm has lesser smoke detectors compared to Eureka. The number of smoke detectors in the AHU room and plants room contain the most units compared to other rooms. These two rooms controls electricity current and are highly flammable. Thus, smoke detectors are required to detect the occurrence of fire. There is no pressurized escape route in Eureka and IPharm.

iv. Hose Reel

Hose reel is considered as the main weapon in fighting fire, for the use of the building occupants. Hose reel delivers more water than several portable extinguishers added together. The hose reels in Eureka are in good condition. Every exit door has one hose reel beside it. Although they have been well maintained, the janitors of Eureka like to put their cleaning tools inside the special compartments for the hose reels. It is very important that they should know that this would cause disruption in case of a fire incident. The hose reels in IPharm are maintained at very good condition. Since the building is newly constructed, the things inside are very new. Furthermore, they have maintained it very well. Fire hydrant is an active fire protection and a source of water to enable fireman to tap into the water supply when extinguishing fire. There are 3 external hydrants constructed in Eureka and there is only 1 fire hydrant at the IPharm. Alarm system is used to warn the

building occupants in cases of occurrence of fire. It is to give them an early warning to escape the building. Every building must be equipped with alarm systems installed in accordance to the UBBL 1984 [4]. The fire alarm systems in Eureka are installed next to the hose reels located at every exit door near to the toilets. It is painted in red in colour. So, the occupants can notice it easily. The main control panel for fire detection and alarm system in Eureka is directly connected to the Development Unit in USM. The alarm systems in IPharm are usually installed near the exit door too. The ideal positions for fire alarm systems to be installed are almost the same on every floor. The fire detection system in IPharm is in the control panel room which is a restricted area. The control room is monitored by security guards.

v. Emergency Lighting

Emergency lighting is the lighting for an emergency situation when the main power supply fails. The occurrence of fire may cause a disruption of electricity supply. Emergency lighting is normally used to give lighting so that person of all ages can escape safely because it emergency lighting has the backup electricity to give luminance once the power has cut. Eureka has installed a number of emergency lighting in the building. The installation of emergency lighting along the walkway is mainly due to the structure of the building. When fire occurs, once the occupants come out of their offices, they will have lighting to guide them to the exit. Emergency lighting in IPharm is only installed at certain areas. They only installed emergency lightings in the office and lobby.

The number of emergency lightings in both Eureka and IPharm are almost the same. This chapter discusses the data collected from both buildings. Both buildings have installed building security system. They have installed proper Intrusion detection, perimeter control, lighting system and access control. The building security systems in both buildings are in good condition but Eureka needs to enhance its security system. Ipharm needs to enhance its lighting system only. Both buildings have adequately installed active fire protection system. All the active fire protection systems are in good condition.

DATA ANALYSIS

The security systems in IPharm is more advanced and tighter than Eureka judging from the criteria of access control, perimeter control and intrusion detection. Eureka is under the control of USM. USM has many buildings besides of Eureka. Therefore, the controls in Eureka (Figure 1) are not as tight as compared to IPharm (Figure 2), which is under the control of the Ministry.

Security in USM is not set up only for Eureka but the people who access USM. The security in IPharm is tighter compared to Eureka because are there to secure IPharm only. The access control system in IPharm uses a thumb print system (Figure 3) whereby the staff needs to verify their identity with their key card and thumb print. On the other hand, access card system is the only access control system used in Eureka (Figure 4). Thumbprint access system is more secure compared with key card access system. People need to identify themselves by using the keycard and thumbprint. Therefore, if someone's thumbprint is not stored in the system that particular person cannot access the building.

Figure 1: The condition of Eureka which manage by USM

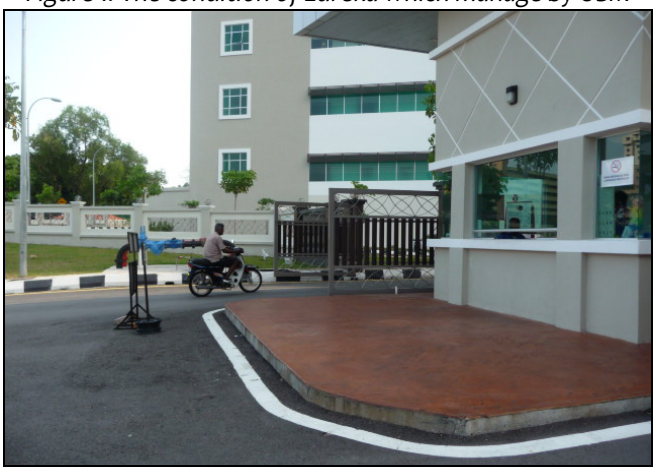

Figure 2: The perimeter control and access control in IPharm building

Figure 3: Thumb print access control system in Eureka building

Figure 4: Key card access control system in IPharm building

Security lighting is the element that both buildings need to improve. Both buildings did not install any security lighting. Security lighting is important that it give luminance to the space. This is because the

security lighting system has the sensor to detect the human heat. So, it will brighten the space if there is human passing by. The lighting system in Eureka uses fluorescent lamp (Figure 5). It is costly if compared to cove lighting in IPharm (Figure 6). Fluorescent requires a ballast to regulate electricity current through the lamp. Cove lighting is more energy efficiency compared with fluorescent. The number of light in Eureka needs to be increased at the entrance. It is very dark at night.

Figure 5: Flourescent lighitng system in Eureka building

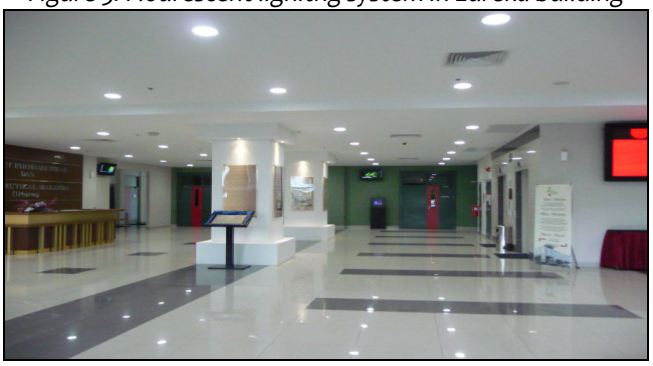

Figure 6: Cove lighting in IPharm building

Figure 7: Speed dome at ground floor in Eureka building

Figure 8: Pan Tilt zoom at the guard house in IPharm building

The intrusion detection in Eureka needs to be enhanced. The CCTV is only installed at the ground floor and some at certain areas but they do not cover the whole compound (Figure 7). This is because Eureka building is renting their space to the other offices. Eureka is not responsible to help them install the CCTV. They have to install CCTV on their own. Therefore, some areas are covered with CCTV while some are not. IPharm do not have many CCTV but its vision covers every corner of the building (Figure 8). The active fire protection system in both buildings is properly installed in accordance to UBBL [4].

CONCLUSIONS

The building security system and active fire protection system has been explained according to their functions and uses in an administration building. The four components such as perimeter control, access control, lighting system and intrusion detection are very important to ensure the safety of the occupants and to prevent intrusions. The active fire protection system is extremely crucial in cases of fire in order to minimize the loss of assets and lives. This system cannot be neglected by owners of all types of building. It is very important to help reduce injury and death. By comparison, the security system in IPharm is tighter and more advanced than Eureka. This is because IPharm is a newly constructed building and it is under the control of the Ministry. Therefore, they have more funds to install the system. While Eureka is under the control of USM, it does not have a lot of funds to install a more advanced security system. Furthermore, Eureka is an old building and less burglary happens. For the active fire protection system, both buildings complied with the requirements of UBBL. It is found that the components are suitably applied in the administration buildings. Eureka needs to make more enhancements in its building security system. IPharm only has one component that it needs to strengthen that is its lighting system.

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