ANALYSIS OF FIRE PROTECTION SYSTEMS, LIFE SAVING FACILITIES AND ORGANIZATIONS IN THE BUILDING Y PT X YEAR 2021

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ABSTRACT
Background: Electrical short circuits caused 62 percent of fire accidents in Depok City in the last five years, according to data from the Depok City Fire Department (2021). The Y building was experienced a fire in 2017 due to an electrical short circuit. The Y Building, which has 20 floors, is required to implement fire protection management, such as the application of fire protection systems, life-saving facilities and organization. These things aim to minimize or even eliminate losses that may arise if fires occur again, according to the Minister of Public Works Regulation No. 20 of 2009. The goal of this study was to determine if the Y Building's application of fire prevention systems, life saving facilities and organization complied with existing regulatory criteria. A descriptive study design and a qualitative technique were used in this study. The results of this study indicate that the application of a passive protection system at the Y Building is included in the Enough category (C), the application of an active protection system is included in the Enough category (C) , the application of life saving facilities are included in the Enough category (C) and the implementation of organizations is included in the Less category (K). It can be seen from this study that the application of fire protection systems, life saving facilities, and organizations in Building Y has not been included in Good category or in accordance with the existing standards
Keywords: *Fire Protection System, Life Saving Facilities, Organization, Multi-storey Building*

1. INTRODUCTION

The existence of high-rise buildings, especially in urban areas is often found. The characteristics and structure of each building also differ depending on the function of the building such as lodging buildings, office buildings, and shopping centers. Although the characteristics and structures are not the same, each building must ensure the safety of occupants and visitors from existing hazards and provide a sense of comfort. It is stated in UU Number 28 of 2002 concerning Buildings that the building has a predetermined capability requirement to prevent hazards, one of which is fire hazard [1].

The National Disaster Management Agency or BNPB (2021) explains that fire is a situation where a building in a place is hit by a fire that causes losses and/or victims. [2] From data collected by the International Association of Fire and Rescue Services (2020), 46 countries reported fire incidents in 2018 with a total of 4,595,102 cases. In addition, of the 24 countries that reported, the highest number of fire incidents and always increasing every year was the incidence of fires in buildings and residential buildings with 763,153 cases in 2015, 847,598 cases in 2017, and 867,059 cases in 2018. [3]

In Indonesia, fire incidents are also unavoidable. It was recorded on the JABAR Open Data website written by the West Java Province Communication and Information Office that 351 fire cases occurred in West Java Province in 2019 and increased in 2020 to 626 fire cases [4]. The city of Depok also showed an increase in the incidence of fires. Based on data from the Depok City Fire Department (2021), in 2013 there were 142 fire cases, then increased in 2014 with 195 fire cases, then increased again in 2015 with 226 fire cases, and increased again in 2016 with 241 fire cases [5]. Because the number of fire incidents continues to increase, fire prevention and control measures must be prioritized to minimize or even eliminate the losses that may arise.

In accordance with the Regulation of the Minister of Public Works No. 20 of 2009, the application of fire protection management is required to build a building

that has a minimum population of 500 people, or has a minimum area of 5,000 m2, or has a building height of more than 8 floors. Fire protection systems, life-saving facilities, and organization are some elements of fire protection management to mitigate or reduce the risk of fire in buildings [6]. Completeness of fire protection systems and rescue facilities can create building conditions that are safe from fire (Hidayat, 2017) [7]. In addition, an organization in buildings is also needed to manage fire prevention efforts by establishing an organization, its duties, and responsibilities (Iswandinata, 2013) [8]. By implementing the above fire prevention efforts, it can improve the security and resilience of the building from fire hazards and also provide comfort and a sense of security to building occupants. However, it is possible that a fire can still occur in the building.

Based on statistical data from the DKI Jakarta Provincial Fire and Rescue Service, in the last 5 years, the cause of fires in DKI Jakarta is dominated by electricity [9]. Likewise, in the case of fires in Depok City, based on data from the Depok City Fire Department (2021) 62% of fire incidents in Depok City in the last 5 years were caused by electrical short circuits [5]. An example of a fire incident in a building caused by an electric short circuit is the 2015 fire incident at the Margo City Building which allegedly occurred due to an electrical short circuit in one of the entertainment venues in the building (Virdhani & Purnama, 2015) [10].

Building Y is one of the projects of PT X with a land area of 1.6 ha and a height of 20 floors. Building Y stands above one of the shopping centers in Depok City. In October 2017, Building Y experienced a fire. The initial location of the fire occurred from the generator room which was on the basement floor [11]. The fire was caused by an electrical short that caused sparks and burned cables, including burning the alarm cable [12]. Some residents of the 18-floor apartment were trapped by smoke from the fire [13]. Eight residents of Building Y were also rushed to the hospital and the manager bears all the costs of treatment and lodging for residents who were evacuated to the hotel [14]. Based on this, it is necessary to conduct research related to "Analysis of the Suitability of the Application of Fire Protection Systems, Life Saving Facilities, and Organization at Y PT X Building in 2021".

2. METHODS

This study uses a descriptive study design and a qualitative approach. This research was conducted at Building Y PT X and was carried out in May-June 2021. Data collection was carried out using observation, filling out a checklist sheet containing requirements for a passive fire protection system, an active fire protection system, life-saving facilities, and organizing and reviewing documents. Supporters owned by Building Y PT X. In addition, semi-structured interviews were also conducted to strengthen the observations obtained. Informants in this study were 4 people from the building management. The data obtained will be compared with applicable standards such as Peraturan Menteri Pekerjaan Umum No.26 Tahun 2008, Peraturan Menteri Pekerjaan Umum No.20 Tahun 2009, Permenakertrans No. 4 Tahun 1980, SNI 03-1745-2000, SNI 03-3989-2000, SNI 03-3985-2000, SNI-1736-2000, SNI 03-1746-2000, SNI 03-6574-2001 and NFPA 101. The results of the comparison will be concluded based on the fire audit assessment level table from the Pd-T-11-2005-C Puslitbang Pemukiman documents in 2005.

3. RESULT

Based on the data collection and analysis carried out, the level of suitability of the application of passive protection systems, active protection systems, life-saving facilities, and organization at Building Y PT X can be seen in Table 1, Table 2, Table 3, and Table 4, the following is the table :

Table 1 Score Value of the Passive Protection System

No	Passive Protection System	Score Value
1	Building Materials (fire resistance test)	100%
2	Building construction	100%
3	compartmentization	75%
4	Protection On Openings	0%
	Average	68,75%

The level of conformity obtained is based on the results of the comparison of the data with the applicable standards, namely the Regulation of the Minister of Public Works no. 26 of 2008 and SNI 03-1736-2000.

Table 3 Score Value of the Active Protection System

No	Life Saving Means	Score Value
1	Standpipe Systems	63,63%
2	Fire Hydrant	50,00%
3	Automatic Sprinkler System	50,00%
4	Fire Extinguisher	58,34%
5	Fire Detector	50,00%
6	Fire Alarm	84,62%
	Average	59,43%

The level of conformity obtained is based on the results of the comparison of the data with the applicable standards, namely the Regulation of the Minister of Public Works no. 26 of 2008, SNI 03-1745-2000, SNI 03-3989-2000, Regulation of the Minister of Manpower and Transmigration No. 4 of 1980, and SNI 03-3985-2000.

Table 3 Score Value of Life Saving Facilities

No	Life Saving Means	Score Value
1	Means of Exit	55,56%
2	Emergency Door	83,33%
3	Emergency Stairs	50,00%
4	Exit Directions	50,00%

5	Emergency Lighting	22,22%
6	Meeting Place	100%
	Average	60,18%

The level of conformity obtained is based on the results of comparison of data with applicable standards, namely the Regulation of the Minister of Public Works No.26 of 2008, SNI 03-1746-2000, SNI 03-6574-2001, and NFPA 101.

Table 4 Value of Organizing Score

No	Organizing	Score Value
1	Fire Protection Organization	0%
2	Emergency Response Procedure	10,00%
3	Human Resources	66,67%
4	Fire Education and Training	100%
	Average	44,16%

The level of conformity obtained is based on the results of the comparison of data with applicable standards, namely the Regulation of the Minister of Public Works No. 20 of 2009..

4. DISCUSSIONS

Passive Protection System

Based on the Fire Audit Assessment Level in the document Pd-T-11-2005-C Research and Development Center of the Ministry of Public Works, the passive protection system in Building Y is included in the Enough (C) category, which means that the application of a passive protection system in Building Y is appropriate but there are still some requirements that are not following the existing reference standards. This is not in accordance with the research conducted by Ayu (2017) at PT Suzuki Indomobil in 2017 which explained that the application of a passive protection system in the building was included in the Good category (B) with a score of 100% [15].

Active Protection System

Based on the Fire Audit Assessment Level contained in the Pd-T-11-2005-C Center for Research and Development of the Ministry of Public Works, the active protection system in Building Y is included in the Enough (C) category, which means that there are still a small number of installations that are not following the reference standard. there is. This is not in accordance with the research conducted by Putri, et al (2019) in the CL Semarang Hotel and Apartment Building in 2018 which explained that the application of an active fire protection system in the building was included in the Good category (B) with a score of 84% [16].

Life Saving Facilities

Based on the Fire Audit Assessment Level contained in the document Pd-T-11-2005-C of the Research and Development Center of the Ministry of Public Works, the life-saving facilities in Building Y are included in the Enough (C) category, which means that there are still several installations in the life-saving facilities belonging to Building Y which still not following the existing reference standards. This is in accordance with the research conducted by Putri, et al (2019) in the Hotel and Apartment Building CL Semarang in 2018 which explained that the application of life-saving facilities in the building was included in the Enough (C) category with a score of 79% [16].

Organizing

Based on the data analysis conducted, the average level of organizational suitability at Building Y PT X is 44.16%. Based on the Fire Audit Assessment Level in the document Pd-T-11-2005-C of the Research and Development Center of the Ministry of Public Works, the organization in Building Y is included in the Less (K) category, which means that the implementation of organization in Building Y is still not following the existing reference standards. This is not in accordance with the research conducted by Rima (2019) at PT Indonesia Comnets Plus in 2017 which explained that the implementation of organizing at PT Indonesia Comnets Plus was included in the Good category (B) with a score of 90.4% [17].

5. CONCLUSION

From this research, it can be concluded that:

a. The level of suitability of the application of the passive protection system in Building Y is included in the Enough category (C) with a value of 68.75%, which means that there are a small number of installations that do not comply with the requirements.
b. The level of suitability of the application of the active protection system in Building Y is included in the Less (K) category with a value of 59.43%, which means that the application is not in accordance with the requirements at all.
c. The level of suitability for the application of life-saving facilities in Building Y is included in the Enough category (C) with a value of 60.18%, which means that there are a small number of installations that do not comply with the requirements.
d. The level of suitability for the implementation of organizing in Building Y is included in the Less (K) category with a value of 44.16%, which means that the implementation is not in accordance with the requirements at all.

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REFERENCES

[1] Undang-Undang Nomor 28 Tahun 2002 tentang

Bangunan Gedung. 2002.

[2] Badan Nasional Penanggulangan Bencana, Definisi Bencana - BNPB. 2021. [Online]. Available: https://www.bnpb.go.id/definisi-bencana (Accessed: 26-Mar-2021).

[3] International Association of Fire and Rescue Services, World Fire Statistic. CTIF. 2020

[4] Dinas Komunikasi dan Informatika Jawa Barat, Jumlah bencana kebakaran di Provinsi Jawa Barat Tahun 2019. 2019. [Online]. Available: https://data.jabarprov.go.id/dataset/jumlah-bencana-kebakaran/resource/ e7 09f8 25-9b53-4c18-aaa1-7ccace3bc429?inner_span= True (Accessed: 29-Dec-2020).

[5] Damkar Kota Depok, Data Kebakaran. 2021. [Online] Available: http://damkar.depok.go.id/data-kebakaran/ (Accessed: 29-Dec-2020).

[6] Peraturan Menteri Pekerjaan Umum No. 26 Tahun 2008 tentang Persyaratan Teknis Sistem Proteksi Kebakaran Pada Bangunan Gedung dan Lingkungan. 2008

[7] Hidayat, D.A., dkk., "Evaluasi Keandalan Sistem Proteksi Kebakaran Ditinjau Dari Sarana Penyelamatan Dan Sistem Proteksi Pasif Kebakaran Di Gedung Lawang Sewu Semarang". Jurnal Kesmas, 5(5): 134-145, 2017

[8] Iswandinata, F., "The Analysis of Fire Prevention In An Efford to Fire Control PT . PJB UBJ O & M Paiton Steam Power Plant In the Probolinggo District" Artikel Ilmiah Hasil Penelitian Mahasiswa 2013. [Online]. Available: http://repository.unej.ac.id/handle/123456789/12016. 2013.

[9] Dinas Penanggulangan Kebakaran dan Penyelamatan Provinsi DKI Jakarta, Statistik. 2019. [Online]. Available: https://www.jakartafire.net/statistic (Accessed: 29-Dec-2020).

[10] Virdhani, M. H. & Purnama, R. R., Kebakaran di Margo City Depok Berasal dari Tempat Karaoke. 2015. [Online]. Available: https://metro.sindonews.com/berita/979839/170/kebakaran-di-margo-city- depok-berasal-dari-tempat-karaoke (Accessed: 11-May-2021)

[11] Wahid, A. B., "Hampir 8 Jam, Kebakaran di Gedung Y Belum Padam". 2017. [Online]. Available: http://news.detik.com/berita/d-3670895/hampir-8-jam-kebakaran-di-gedung-y-belum-padam (Accessed: 30-Mar-2021).

[12] Pitoko, R. A., "Sebulan Berlalu, Polisi Akhirnya Ungkap Penyebab Kebakaran di Gedung Y". 2017. [Online]. Available: https://megapolitan.kompas.com/read/2017/11/03/13072271/sebulan-berlalu- polisi-akhirnya-ungkap-penyebab-kebakaran-di-gedung-y(Accessed: 26-Mar-2021).

[13] Intan, D., "Gedung Y Terbakar, Berikut Fakta-faktanya". 2017. [Online]. Available: https://www.tribunnews.com/metropolitan/2017/10/05/gedung-y-depok-terbakar-berikut-fakta-faktanya?page=all (Accessed: 26-Mar-2021).

[14] Hasyim, I., "Gedung Y Kebakaran, Pengelola Tanggung Kerugian Korban". 2017. [Online}. Available: https://metro.tempo.co/read/1022377gedung y-kebakaran-pengelola-tanggung-kerugian-korban (Accessed: 26-Mar-2021).

[15] Ayu, Nofrita, "Analisis Penerapan Manajemen Dan Sistem Proteksi Kebakaran di PT. Suzuki Indomobil Motor Plant Tambun Tahun 2017". .(Electronic Thesis or Dissertation). 2017. Retrieved from https://localhost/setiadi

[16] Putri, N., et al, "Analisis Sistem Proteksi Kebakaran Sebagai Upaya Pencegahan Kebakaran". Bangun Rekaprima, 5(2), pp 59-69. 2019.

[17] Rima Ayunda, "Gambaran Sistem Proteksi Kebakaran Dan Penyelamatan Jiwa Di Pt Indonesia Comnets Plus Tahun 2017". Skripsi thesis, Universitas Pembangunan Nasional Veteran Jakarta. 2019