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Fire Management Analysis at Ahmad Dahlan University Yogyakarta

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ABSTRACT

Background: Fire management is a systematic series that includes

prevention, countermeasures, and post-fire rehabilitation. The fire incident due to an electrical short circuit that occurred in the practicum room of Campus 4 of Ahmad Dahlan University (UAD) shows that fire risk management has not been optimal, especially related to institutional policies. This study aims to analyze the implementation of fire management at Ahmad Dahlan University Yogyakarta. The research used a qualitative descriptive design with a phenomenological approach and was carried out on Campus 1 to Campus 5 of UAD. Informants were selected by purposive sampling.

Method: Data collection was carried out through in-depth interviews, field observations, and analysis of related documents, with instruments in the form of interview guidelines and documentation. Data analysis includes data reduction, categorization, narrative presentation, and conclusion drawn, while data validity is ensured through triangulation of techniques and sources. **Results:** The results of the study show that at the prevention stage, UAD already has organizations and procedures, coaching and training programs, fire protection systems, fire inspections, and hazard control. However, a formal fire and hazard identification policy is not yet available. At the countermeasures stage, UAD already has a fire emergency response team involving security officers on each campus. Meanwhile, at the rehabilitation stage, post-fire investigation and reporting activities have been carried out, but the official fire audit has not been carried out. **Conclusion:** It is concluded that fire management at Ahmad Dahlan University has been partially operational, but it still needs policy strengthening, formal hazard identification, and fire audits to achieve a comprehensive fire management system.



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1. Introduction

Fire is a condition in which buildings such as residential houses, factories, markets, buildings, and others are hit by fire that causes casualties or losses [1]. According to the National Fire Protection Association, fire is an oxidation event that involves three elements, namely fuel, oxygen, and energy or heat sources that result in property loss, injury, and death. Losses resulting from fires are not only in the form of damage to buildings, but losses that affect human morals and souls [2].

Fire management is a stage that is carried out in 3 stages starting from fire prevention, fire management and rehabilitation. Fire prevention before a fire occurs (pre-fire), countermeasures are carried out when a fire occurs, and rehabilitation is carried out after a fire (post-fire). There are several key elements or activities that must be carried out in managing fire hazards, namely pre-fire including

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management policies, organization and procedures, fire hazard identification, coaching and training, fire protection systems, fire inspections and hazard control/prevention. In the event of a fire, key elements or activities that must be carried out are emergency response and post-fire including audits, investigations and reporting [3].

Ahmad Dahlan University Yogyakarta is one of the private campuses with six campuses and spread across the Special Region of Yogyakarta (DIY). The UAD campus has high activity with a large number of residents, including teaching staff, employees and students.

Based on the preliminary study on November 21-22, 2023, in the areas of household, security, and K3. There has been a fire incident located in the practicum room of Campus 4 of Ahmad Dahlan University as a result of an electrical short circuit. Ahmad Dahlan University does not have a fire control committee and fire-related policies. The building design on UAD campuses 1, 2, 3, and 5 still uses the old plan. So that the active and passive protection system is incomplete on each campus. The head of the Occupational Safety and Health section said that they do not have a K3 organizational structure due to limited people, but there is a fire training program for security that is carried out once a year. Based on this background, the researcher is interested in conducting research on fire management at Ahmad Dahlan University Yogyakarta. The purpose of this study is to analyze fire management at Ahmad Dahlan University Yogyakarta.)

2. Methods

This type of research is qualitative which is shown to obtain information about fire management analysis at Ahmad Dahlan University Yogyakarta. The location of this research was carried out on Campuses 1, 2, 3, 4, and 5 of Ahmad Dahlan University Yogyakarta. The collection of informants in this study used a purposive sampling technique, consisting of key informants, main informants, and supporting informants. Key informants include the K3 UAD section, the main informant includes the Head of BSP, and supporting information includes the KRT and security sections. Research instruments and tools consist of interview guidesheets and documentation tools. The data collection techniques used in this study are in-depth interviews, field observations, and documents related to the topic. Data analysis uses data reduction, categorization, narrative, and conclusion drawn. Data validity uses triangulation techniques and sources.

3. Results and Discussion

3.1. Results

From field findings at Ahmad Dahlan University, the following results were found.

3.1.1. Fire Prevention at Ahmad Dahlan University Yogyakarta

3.1.1.1 Management Policy

Ahmad Dahlan University of Yogyakarta does not yet have an official fire policy. For the extinguishing process in the event of a fire, UAD gives this responsibility to security guards on each campus. Management policy is a program used to control and overcome fire incidents in a company or organization [4]. The following are the results of the interview obtained from informant A1

"...*The policy is not certain if you ask if you have it*" (Informant A1).

Strengthened from what informant A1 said, informant C10 explained:

"...*The official one is not there yet*." (Informant C10).

From what was conveyed by the informant, it can be concluded that the research site does not have an official policy.

3.1.1.2 Organization

Ahmad Dahlan University Yogyakarta does not yet have a special fire organization. However, the UAD campus has an emergency response organization consisting of security guards with each task, so there is no fire-focused task, so the emergency response team cannot be determined. This was conveyed by the following informants:

"...*The entry of emergency response, if specifically for fires, does not exist yet*." (Informant A1).

The information from informant B1 is:

"...If there is no organization for the fire itself...". (Informant B1)

So at Ahmad Dahlan University, it does not have a fire organization but has an emergency ladder for disasters and has not been standardized according to fire requirements.

3.1.1.3. Identification of Fire Hazard risks

Fire hazard identification is an identification process that causes potential fire hazards in the organization. Ahmad Dahlan University Yogyakarta has not officially identified the risk of fire hazards. However, the UAD Safety and Health (K3) unit made IBPR and JSA 4 years ago and until now no further improvements have been made.

The results of the key informant's questions are based on the results of the interviews that have been conducted:

"...I've done IBPR or JSA before, because this is my own, so I haven't fixed it again after 4 years ago" (Informant A1).

This is reinforced by the statement from informant B1 as follows:

"...For official identification, which is then recorded, it does not exist or does not exist." (Informant B1).

Additional information from informant B1 :

"... But unofficially, for example, related to the installation of fire equipment, we will definitely identify it..." (Informant B1).

The conclusion is that the risk identification process related to fire hazards has not been carried out but rather the identification of hazard risks for Occupational Safety and Health.

3.1.1.4. Coaching and Training

Ahmad Dahlan University has a coaching and training program related to fire management at least once a year. This training has only been held on 1 time and in collaboration with the fire department (DAMKAR). The following is information from the results of the interview that A1 has conducted:

"... It should be once every 1 year..." (Informant A1) Reinforced with information from B1:

"...There is a routine collaboration with the fire service at least once a year..." (Informant B1).

The implementation of coaching and training based on information concluded that training has been carried out and there is joint training with the fire department.

3.1.1.5 Fire Protection System

Ahmad Dahlan University Yogyakarta is equipped with an active protection system, namely campus 1 has a fire extinguisher and hydrant. Campus 2 has alarms, lights, and hydrants. Campus 3 has a roof. Campus 4 has a fire apparatus, hydrant, fire alarm, springkel, and smoke detector. Campus 5 has a fire extinguisher and alarm. However, for the fourth campus of Ahmad Dahlan University, there is an emergency door that is blocked by objects such as cardboard, gallons, and tables that can interfere with the evacuation process in the event of a disaster. Then the passive protection system in the form of means of escape such as exits, emergency stairs, emergency lights, evacuation routes, and gathering points. However, there are several campuses that are not complete for life-saving facilities such as campuses 1, 2, 3, and 5 where there are only evacuation routes and gathering points. The following is an excerpt from the interview of informant A1:

"Alhamdulillah, it has been fulfilled for the new buildings, the other buildings can only be fired..."

This is strengthened by the statement from informant B1, namely:

"...The most important thing is that at least there is at least one apar yaaa on each campus..."

The fire protection system submitted by the informant is only a fire extinguisher.

3.1.1.6. Fire Inspection

Ahmad Dahlan University Yogyakarta regarding active and passive protection systems found that UAD conducted an inspection conducted by the K3 section and vendors from DAMKAR. Then on campus 2 for active protective equipment and hydrants do not know whether they are still working or not. Because it is rarely used and not inspected. The following information was obtained from informant A1:

"... If the apar is once every 3 months, the hydrant has its own checklist every 3 months, pringkel has a check every 1 to 1/2 years. If it is passive, usually each unit reports to me and continues to be followed up for improvement. ". (Informant A1)

The following information from informant C2:

"... On the place where there is a siren sound, we have not tried it with hydration, we don't know if it works or not, because it is rarely used and inspected... ". (Informant C2)

The execution of the fire inspection has been carried out and is routine based on the conclusions of the 2 informants.

3.1.1.7. Hazard Control/Prevention

Ahmad Dahlan University carries out *preventive* activities such as not using flammable materials and ensuring that all electrical equipment is in a state of outage when entering the semester break. Then another preventive measure is that there is a smoke-free area rule that is applied to all campuses of Ahmad Dahlan University Yogyakarta. By taking *preventive* measures to reduce the risk of fire. This was conveyed by the informant as follows:

"Prevention is to choose materials that are not flammable. The control can be used a burlap sack if you can't use a tool. We provide the apparatus according to the type of laboratory, namely Co2" (Informant A1).

Additional information from informant C2 :

"... For cigarettes, there is a ban on smoking in the UAD campus area...". (Informant C2)

Hazard control and prevention that has been carried out is to provide warning signs, the use of non-flammable materials which means that it has been implemented.

3.1.2. Fire Remediation at Ahmad Dahlan University Yogyakarta

3.1.2.1. Research and Reporting

Ahmad Dahlan University conducted investigations and reports related to fires. The UAD investigation department analyzes the cause, so that it can then evaluate and find solutions so that it does not happen again in the future. Then for the reporting, there is an SOP for reporting carried out by the security guard by writing the minutes which are then reported to the superiors. The following is the informant's statement based on the results of the interview conducted with informant A1:

"... How is the mechanism so that the same thing does not happen in the future". (Informant A1)

Additional information from informant B1 is:

"...After the fire, analyze and investigate what the cause is, so that then we evaluate and find a solution so that it does not happen again in the future."(Informant B1)

From 2 informants said that the procedure for reporting already existed

3.1.2.2. Fire Audit

Fire audit activities officially do not exist at Ahmad Dahlan University Yogyakarta, only limited to ordinary evaluations and the lack of trained human resources in the K3 section. The following information from informant A1:

"...Not because no one has been trained yet ..." (Informant A1)

The information was strengthened by information from informant B1, namely:

"The k3 audit does not exist yet, it is limited to ordinary evaluation activities, routine evaluations ".(Informant B1)

So it can be known that the fire audit has not been carried out due to the lack of competent personnel.

3.2. Discussion

3.2.1. *Fire Prevention at Ahmad Dahlan University Yogyakarta*

3.2.1.1 *Management Policy*

Menurut Ramli, 2010 said that for fire control and control in organizations or companies, it is the policy of management. The management has the responsibility to prevent wildfires, because it is the management that bears the greatest consequences in the event of a fire [5]. Research conducted by Musyafak, (2020) explains that to prevent fires, fire management policies must be implemented and efforts to prevent fire must be carried out in a well-organized manner [6]. In the Yogyakarta City Regional Regulation Number 1 of 2018 concerning Fire Prevention and Control, it is explained that every owner or user of a building that has the same height or more than 5 floors or has a building area exceeding 5.00 m² or the same number of occupants or more than 500 people, is obliged to form a Building Fire Safety Management (MMKG). Thus, there is a need for fire management, so that all fire prevention programs can run well.

3.2.1.2 *Organization*

Organization and procedures have a role for management in efforts to prevent fires. Thus, there needs to be a good organization. For example, forming a fire organization that is structural or non-structural for a company or organization. For example, a corporate organization forms an emergency response team that has the goal of helping to fight a fire somewhere [7]. This is in line with the research of Rudyarti, E. (2023), namely that at university X for fire disaster management organizations have not been formed and compiled. However, this X university has a disaster preparedness application system. Thus, it can be found out the location of fire extinguishers, evacuation routes, and gathering points that are made simply because there is no organization of emergency response teams [8]. Based on the Decree of the Minister of Labor of the Republic of Indonesia No. 186/MEN/1999 concerning Fire Management Units in the Workplace, it is said that every company/agency with more than 50 workers or workplaces where there is a potential for moderate and severe fire hazards, it is mandatory to establish a Fire Management Unit. According to Song's previous research, et al (2014) in Rudyarti's research, 2023) stated that it needs to be managed properly for fire management organizations. Thus, risk analysis can be carried out through observation activities as well as routine operations and observations, elimination, prediction of fire accidents and monitoring of fire potential [9]

3.2.1.3. *Identification of Fire Hazard risks*

There are approaches made to carry out the process of identifying fire hazard risks, namely looking at the source of fire, production process, and flammable material [10]. According to research by Pramesti & Agustina, (2021) the process of identifying fire hazards is important, this aims to find out what problems can occur and can cause fires [10]. According to Tarwaka, (2012) in the research of Pramesti & Agustian, (2021) also explained that hazard identification was carried out to find out what are the factors that cause fires. Thus, it is necessary to carry out a fire hazard identification process, in order to find out the problems that can cause fires. So that fire disasters can be prevented [11].

3.2.1.4. *Coaching and Training*

The implementation of emergency response coaching and training is a process to Testing the level of vigilance and understanding of the implementation of emergency response procedures for personnel. This activity is carried out so that all parties can have skills and reliability in dealing with fire situations Feber & Muchlis, (2021) [12]. In line with the research of Mufida and Martiana, (2019), namely emergency response training is held regularly once a year with different types and levels of material difficulty for each meeting [12]. According to the Decree of the Minister of Manpower of the Republic of Indonesia No. 186 of 199 article 2 paragraph (2) letter e, it is to organize periodic fire management exercises and rehearsals which aim to test the level of understanding and vigilance for personnel in emergency conditions. However, not all human resources at UAD received this training, only the security guard and a few laboratory representatives. In line with Indriyatmoko's

research, (2020) explained that fire emergency response training should be given to all parties related to the activities in the place. This aims to improve the ability and quality of fire management efforts [13].

3.2.1.5 Fire Protection System

Active protection systems in buildings and the environment are stipulated in the Regulation of the Minister of Public Works Number 26/PRT/M/2008 active fire protection systems are manual or automatic fire detection systems such as sprinklers, upright pipes and fire hoses, as well as chemical fire extinguishers such as fire extinguishers. Meanwhile, the passive fire protection system, according to Maret and Hidayat, (2020) an active protection system regulates the presence of building structural components that are in accordance with the level of fire resistance type. This system has fire resistance to the building structure, opening protection and space compression [14]. In accordance with (Law No. 28 of 2002) regarding the requirements for building reliability in article 19 regarding safety from fire hazards. Buildings must implement a total protection system, where there is active and passive protection and establish fire hazard safety management [15]. According to the research of Setiawan et al., (2019) every building must be equipped with an evacuation facility that can be used for all building occupants. Thus there is enough time for the process of saving oneself with a sense of security without hindrance due to an emergency situation [16].

3.2.1.6. Fire Inspection

The purpose of inspections is to identify potential sources of hazards in the workplace. Then to evaluate the level of risk to the workforce and to control to a safe level for occupational safety and health [17]. In the Yogyakarta City Regional Regulation Number 1 of 2018 concerning Fire Prevention and Control, it is explained that to prevent fires in buildings, it is required to carry out regular maintenance, maintenance, and inspection processes on the fire protection system. Then the inspection and testing were carried out in the building on fire extinguishers, fire fighting equipment and life saving equipment [18]. The safety management system has several parts, one of which is the inspection section. Inspections function to prevent accidents and hazards by detecting and correcting findings made by the inspection team as the person in charge of implementing the K3 inspection program, namely the K3 section, namely *the staff* [19].

3.2.1.7. Hazard Control/Prevention

The company must take steps to prevent fires, namely:

- How to control the fire source. For example, by establishing no-smoking zones in hazardous workplace areas and storing flammable materials.
- How to control the fuel source. For example, security in the storage of compost materials, the use of electrical installation materials and stockpiling warehouses [20].

According to the research of Sari, et al. (2021) the condition of XYZ printing to design a danger sign as a fire prevention that will be passed through with 4 stages (*Clarion Safety Systems*, 2013) [21]:

- The existence of existing safety signs, signs, and markings must be assessed in the condition of the work area.
- Selection of suitable signs
- Choose the right location, size and style
- Then choose the appropriate material

According to OSHA/ANSI Z535 the selection and installation of the appeal sign includes the "WARNING" group. The sign is made using vinyl sticker paper installed on the floor with a height between 115-167 cm

3.2.2. Fire Remediation at Ahmad Dahlan University Yogyakarta

3.2.2.1. Research and Reporting

Ahmad Dahlan University conducted investigations and reports related to fires. The UAD investigation department analyzes the cause, so that it can then evaluate and find solutions so that it does not happen again in the future. Then for the reporting, there is an SOP for reporting carried out by the security guard by writing the minutes which are then reported to the superiors. The following is the informant's statement based on the results of the interview conducted with informant A1:

"... How is the mechanism so that the same thing does not happen in the future". (Informant A1)

Additional information from informant B1 is:

"...After the fire, analyze and investigate what the cause is, so that then we evaluate and find a solution so that it does not happen again in the future." (Informant B1)

From 2 informants said that the procedure for reporting already existed

3.2.2.2. Fire Audit

The audit itself has the purpose of evaluating the suitability of the fire management system, of course, with applicable provisions or standards. From the audit we will find out what are the advantages and disadvantages of fire management. Thus, improvement steps can be taken [28]. The audit itself has the purpose of evaluating the suitability of the implementation of the fire emergency response system in an organization with the applicable provisions and standards, namely in the Minister of Public Works Regulation No. 26 of 2008 concerning Technical Requirements for Fire Protection Systems in Buildings and the Environment. From this activity we can find out what are the disadvantages and advantages of the system [29]. According to research by Sarbiah et al., (2022) fire audits are the last element of a fire management system. Audit activities are different from inspections. The purpose of this audit activity is to see and evaluate the conformity of the fire management system with applicable regulations. From this activity, it can be found out what are the advantages and disadvantages in fire management, so that appropriate corrective steps can be taken immediately [30]. Fire audit activities officially do not exist at Ahmad Dahlan University Yogyakarta, only limited to ordinary evaluations and the lack of trained human resources in the K3 section. The following information from informant A1:

"...Not because no one has been trained yet ..." (Informant A1)

The information was strengthened by information from informant B1, namely:

"The k3 audit does not exist yet, it is limited to ordinary evaluation activities, routine evaluations" .(Informant B1)

So it can be known that the fire audit has not been carried out due to the lack of competent personnel.

4. Conclusion

Based on the research that has been carried out on the analysis of fire management at Ahmad Dahlan University Yogyakarta, it can be concluded as follows:

1. Universitas Ahmad Dahlan Yogyakarta already has organizations and procedures, coaching and training, fire protection systems, fire inspection, and hazard control/prevention. However, there is no fire policy and hazard identification.
2. Universitas Ahmad Dahlan Yogyakarta already has an emergency response team.
3. Ahmad Dahlan University Yogyakarta has already had investigation and reporting activities. However, there has been no fire audit activity

Statement

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Conflicts of Interest: This research is one of the sub-variables of several research variables conducted by researchers, so that if there are similarities in the future due to similar research subjects.

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