# Analysis Of The Reliability Level Of The Fire System In M.Syafe'i Building

Himawan Hadi Sutrisno, Aditya Fadhlurrahman , Ricko Jonathan, Triyono, Catur setyawan, Jafar Amiruddin, Pratomo Setyadi

*Fire Material and Safety Laboratory, Jakarta State University, Indonesia*
*E-mail: Himawan-hadi@unj.ac.id*

**ABSTRACT**

This study aims to determine the level of reliability of the fire protection system inthe M. Syafe'i Building, Jakarta State University. The construction of buildings in the city of DKI Jakarta is increasing. Rapid development must be supported by a high protection system to respond to fire hazards. The protection system cannot be separated from the construction of the building, therefore the fire protection systemmust be planned from the beginning along with the planning of the construction of the building itself. Data was collected by means of observation and interviews as well as documentation. Based on the results of field analysis using the Building Safety System Reliability Value, it can be determined that the M.Syafe'i Building at the State University of Jakarta is in a good condition, however, the manager of the M.Syafe'i Building UNJ must pay attention to routine maintenance so that the fire protection system can be used. running as well as function properly.

**keywords**: Development, Protection System, M.Syafe'i . Building

## INTRODUCTION

Fire is a problem that cannot be separated from humans. Building Law No. 28 of 2002 explains that buildings must meet the requirements and safety of buildings that have requirements or the ability of buildings to support loads and the ability ofbuildings to prevent and overcome fire and lightning hazards. Fire hazard is a hazard caused by the potential threat and degree of exposure to fire emission from the start of the fire to the spread of fire, smoke and gas.[1-4] Losses caused by fires are not only damage to buildings that occur, but there are losses that involve morals and the human soul. Some of the causes of fires are thelack of knowledge and public awareness of the dangers of fire, the lack of community preparation to face and overcome the dangers of fire, the handling system that has not been formed and integrated, the lack of infrastructure, and anadequate building fire protection system [2, 5-9]. The increase in development must be

supported by a high level of protection system also to respond to the danger of disaster or fire. The protection system cannot be separated from the building construction, therefore the fire protection system must be planned from the beginning along with the planning of the building construction itself [3, 10-14]. This is in linewith the DKI Jakarta Provincial Regulation Number 8 of 2008 concerning Prevention and Management of Fire Hazards which states that every owner, user and/or building management agency and building environment that has the potential for fires must play an active role in preventing fires and must provide oneof them. saraba saves lives (Perda, 2008).

To analyze the level of reliability of a building, you can use the NKSKB as has been done by others. One of them, Safriandi, who researched case studies using theNKSKB as a measure of the reliability of the Surya Dumai Group Building and thePekanbaru City State Savings Bank (Trikomara & Sebayang, n.d.). Thus the authorproposes a plan to analyze the level of reliability of the fire protection system in one of the tall buildings at the Jakarta State University, namely the Muhamad Syafe'i building, it can also be obtained that the lack of fire protection systems in the Muhamad Syafe'i building will then produce recommendations for improving the prevention system for next year. The aims of this research are:

1. To find out the description of the level of completeness of the site of the activefire protection system owned by the Muhamad Syafe'i building, State University of Jakarta. To find out the description of the level of the active fire protection system owned by the Muhamad Syafe'i building, State University ofJakarta. To find out the description of the level of fire rescue facilities owned by the Muhamad Syafe'i building, Jakarta State University. To find out the Reliability Level of the Fire Protection System at the Muhamad Syafe'i Building, State University of Jakarta.

## MATERIALS AND METHODS

The analysis of this study uses a qualitative descriptive research method that aimsto collect real settings or conditions by collecting primary data sources and collecting more data to obtain results regarding the level of reliability of the fire protection system in the M.SYAFE'I building.

**TABLE 1.** Parameter Weighting Safety

System Components Building

| No | KSKB Parameters | Weight KSKB |
|---|---|---|
| 1 | Site equipment | 25 |
| 2 | Means of rescue | 25 |
| 3 | Active protection system | 24 |
| 4 | Passive protection system | 26 |

The table above is the result of weighting the parameters of the building safety system components that have been determined in the Pd-T-11-2005-C BuildingFire Safety Inspection guidelines used in this study. This weighting uses the Analytical Hierarchycal Process (AHP) method to reduce the element of subjectivity in the components.

**TABLE 2.** Weighting of Sub ComponentsSite Equipment

| No | components | weight% |
|---|---|---|
| 1 | Water sources | 27 |
| 2 | Neighborhood Road | 25 |
| 3 | Distance Between Buildings | 23 |
| 4 | Hydrant Page | 25 |

The evaluation criteria for the following components are used as practical reference materials which include the layout and orientation of buildings, distancesbetween buildings, placement of yard hydrants, provision of open spaces and so onin order to prevent and minimize fire hazards. Assessment of the fire protection condition of the building is carried out by the building management officer.

**TABLE 3.** Weighting of Sub ComponentsRescue Means

| No | components | weight% |
|---|---|---|
| 1 | exit | 38 |
| 2 | Exit Construction | 35 |
| 3 | Helicopter Runway | 27 |

This weighting is used to see the value of several sub-components related to the use of facilities for use by residents and firefighters in evacuation efforts in the event of a fire. This tool also aims to separate threatened individuals from harmfulproducts.

**TABLE 4**. Weighting of Sub ComponentsActive Protection

System.

| no | components | weight% |
|---|---|---|
| 1 | Detect and Alarm | 9 |
| 2 | Siamese Connection | 8 |
| 3 | LightFire Extinguisher | 9 |
| 4 | Building Hydrant | 9 |
| 5 | Springkler | 9 |
| 6 | Smoke Control | 8 |
| 7 | Smoke detection | 9 |
| 8 | Smoke exhaust | 7 |
| 9 | Fire elevator | 7 |
| 10 | Emergency light | 9 |
| 11 | Emergency Power | 8 |
| 12 | Operation control room | 8 |

In the active protection system there are 12 sub components that support the performance of the active protection system. This system works to extinguish firesdirectly so as to minimize the effects of widespread fires.

**TABLE 5.** Weighting of Sub Components Passive

Protection System

| No | components | weight% |
|---|---|---|
| 1 | Building Structure Fire Resistance | 36 |
| 2 | Space Compartment | 32 |
| 3 | Aperture Protection | 32 |

Research on passive protection systems is assessed from 3 sub-components that areuseful for assessing the structural resistance of buildings. The structure of this building is expected to be able to minimize the intensity of fires.

## RESEARCH RESULTS AND DISCUSSION

Observations were made to facilitate the work of collecting data from direct observations in the field. The observation sheet is made in such a way that it canmeet the research data that includes all the variables identified in this study. Theobservation sheet consists of four main parts, namely:

1. Part I is about the completeness of the site which includes: water sources,environmental roads, distances between buildings and yard hydrants.

2. Part II concerns the components of rescue facilities which include: exits,construction of exits and helicopter pads.

3. Part III concerns active protection components which include detection and alarm, Siamese connection, light fire extinguishers, building hydrants, sprinklers, overflow suppression systems, smoke control, smoke detection, smoke exhaust, fire lifts, emergency lighting, emergency electricity and space operation controller.

4. Part IV concerns passive protection components which include: fire resistance of building structures, compartmentalization of rooms and protection of openings.
Assessment of the condition of the KSKB (Building Safety System Reliability) The condition of each KSKB sub-component must be assessed and evaluated. Theassessment is divided into 3 parts, namely:

1. Good : “B” (equivalent value of Bis 100)
2. Enough: "C" (equivalent value of Cis 80)
3. Less: “K” (equivalent value of Kis 60)

The condition value of the sub-KSKB is calculated using the equation:KSKB sub condition value

Equivalence value x weight of sub KSKB x weight of KSKB

*Calculation of the Reliability of the Fire Protection System The reliability value ofthe fire protection system is calculated using formula:*

*Reliability value* = *KT+SP+SPA+SPPKT = value of site*completeness condition

*SP = value of condition of rescue facility*

*SPA = active protection system condition value SPP = value of passive protection system condition*

## CONCLUSION

The level of reliability of the fire protection system in the Muhamad Syafe'i building, State University of Jakarta is 95.02%. This result means that the building protection system of Muhamad Syafe'i, Jakarta State University is in the Good category

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