



An Assessment of the Application of Occupational Safety and Health During the Construction of the Canopy for the Southeast Sulawesi Province's Muna Sugimanuru Airport Terminal Building

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ABSTRACT

Sugimanuru Muna Airport was built by Drs. La Ode Saafi Amane, who was the Regent of Muna for the 1981-1986 period, located on Muna Island, precisely in Kusambi District, West Muna, Southeast Sulawesi. The airport is an area that upholds occupational safety and health in every unit. Therefore, in every implementation or activity, occupational safety and health must be considered.

This study uses a descriptive method. Data collection by distributing questionnaires to all respondents, conducting interviews with PPK, safety and health experts, technical directors, field inspectors, and field observations.

The purpose of this study was to evaluate the implementation of occupational safety and health in the construction project for the canopy of the Sugimanuru Muna Airport terminal building, Southeast Sulawesi, especially in the use of personal protective equipment (PPE)

1. INTRODUCTION

Sugimanuru Muna Airport is located on Muna Island, specifically in Kusambi District, West Muna Regency, Southeast Sulawesi Province. The runway area of this airport is 1600 square meters x 23 meters, and is approximately 26 kilometers from the city of Raha. Geographically, Sugimanuru Muna Airport is located at coordinates 04°45'38"S122°34'09.7"E. Sugimanuru Muna Airport was first built based on the thoughts of a leader named Drs. La Ode Saafi Amane, who was the Regent of Muna for the 1981-1986 period, who upheld four points of vision and mission, namely: encouraging increased and equal distribution of community welfare, improving the quality and carrying capacity of regional infrastructure, improving the quality of public services, improving management and preservation of natural resources. On that basis, Sugimanuru Muna Airport was built for civil services (Jaldin, 2019). Sugimanuru Muna Airport serves as an important link for local residents, facilitating access to essential services and economic opportunities. Economic Impact, Airports such as Sugimanuru are essential to drive economic growth, especially in remote areas, by enabling trade and tourism, (Pratama et al., 2025). The establishment of the airport is part of a strategic vision to improve the quality of public services and infrastructure in the area, (Park, 2023). The construction of the airport reflects a commitment to improving the welfare of the local community by providing better transportation access, (Miftakhuriza et al., 2024).

The airport is an area that upholds occupational safety and health in every unit. Therefore, in every implementation or activity, K3 must be considered. Occupational Safety and Health (K3) is a field that focuses on the health, safety, and welfare of individuals working in an institution or project location. The purpose of implementing occupational safety and health is to maintain a safe and healthy work environment and protect workers, families, customers, and others who may be affected by working conditions.

The more complete the occupational safety facilities or PPE, the fewer indications of work accidents will occur. One of the main causes of work accidents is the suboptimal supervision and implementation of K3 and the lack of safety culture in the workplace. Therefore, Law No. 13 of 2003 concerning manpower states that Article 86, Paragraphs 1 and 2, state that every worker has the right to obtain protection for occupational health and safety, morals and morality, treatment in accordance with human dignity and religious values, to protect the safety of workers or laborers in order to realize optimal work productivity.

In the implementation of Occupational Health and Safety (K3) in the construction of the Terminal Building Canopy at Sugimanuru Muna Airport, K3 regulations have been implemented, including work signs, use of PPE,

evacuation routes, gathering points, and other regulations. However, it has not been implemented optimally. This is indicated by the situation in the field; there are still some workers who do not use complete PPE. In terms of the work environment, it can be said to be organized in the sense that the remaining unused work materials are not scattered, so that it can support work conditions both in terms of workers, heavy equipment, and work activities that can work without being disturbed.

OHS regulations require clear work signs and the use of PPE, but many workers do not consistently use the equipment provided, [Isror et al., (2024)]. While evacuation routes and muster points are established, their effectiveness is undermined by a lack of worker awareness and training, (Desnalia & Waruwu, 2024) (Matury, 2024). Inadequate training and awareness among workers contribute to non-compliance with safety protocols, (Desnalia & Waruwu, 2024; Matury, 2024). Workers may resist adopting new safety practices due to ingrained habits or perceived discomfort. Adeyemo, (2024).

2. LITERATURE REVIEW

2.1. Airport

The definition of an airport is also mentioned in the Regulation of the Minister of Transportation Number 39 of 2019 concerning Airport Arrangement, where an airport is defined as an area facilitated with aviation safety and security facilities, basic facilities, and other supporting facilities and functions as a place for aircraft to take off or land, a place for passenger circulation to board and disembark, a place for loading and unloading cargo or goods that can be on land or water with certain limitations.

2.2. Construction

According to the Regulation of the Minister of PUPR No. 02/PRT/M/2018 concerning amendments to the regulation of the Minister of Public Works No. 05/PRT/M/2014 concerning guidelines for occupational safety and health management systems (SMK3) Construction in the field of public works, construction work is the whole or part of a series of planning and/or implementation activities along with supervision, which includes building structures, civil buildings, mechanical and electrical installations, and other implementation services to realize a building or other physical form within a certain period of time.

2.3. Occupational safety and health

Occupational safety and health (K3) is a crucial aspect that must be implemented by the construction industry, especially in construction projects, to protect workers from accidents and occupational diseases during their work. Based on the Regulation of the Minister of Manpower Number 5 of 2018 concerning occupational safety and health, the work environment prioritizes aspects of worker protection by implementing K3 standards in the work environment of both large-scale and small-scale companies. Neglecting occupational safety and health (K3) in employee performance can have a negative impact on employee productivity, but if K3 is implemented and implemented properly, it will produce optimal performance because employees feel valued and appreciated by the company.

2.4. Personal protective equipment

Personal protective equipment (PPE) is an important tool that functions as protection against physical and health hazards that cannot be eliminated through technical or administrative control. This is indicated in the Regulation of the Minister of Manpower and Transmigration of the Republic of Indonesia No: Per.08/Men/VII/2010 concerning personal protective equipment (PPE), which states that employers are required to provide personal protective equipment (PPE) for workers or laborers in the workplace. Below is the personal protective equipment (PPE) used in the canopy work project for the Sugimanuru Muna Airport terminal building:

1. Head protection (Safety Helmet)
2. Eye protection (Goggles)
3. Face shield (Face Shield)
4. Diving mask (Breathing Apparatus, Reusable Respirator)
5. Respiratory and mouth protection
6. Ear protection (Ear Plug, Ear Muff)
7. Gloves (Safety Gloves)
8. Welding gloves (Welding Glove)
9. Safety shoes (Safety Shoes)
10. Safety vest (Safety Vest)
11. Welding apron (Apron)
12. Full body support (Body Harness)

2.5. Validity Test

Validity is a test used to assess how accurately the data collected from the research instrument reflects the actual value. This test is carried out statistically using person product moment correlation. The validity test with Pearson product moment compares each dependent variable with 2D motion capture analysis (identified as the reference standard). Higher correlation indicates strong concurrent validity (Amalia, R. nur Dianingati, R. setia & Annisaa, 2022). Here is the Pearson product moment formula:

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}}$$

Information:

r_{xy} : Correlation coefficient between variables X and Y

N: Number of trial responses

EXY: Product of variables X and Y

EX²: Product of the squares of the X values

EX²: Square of Y

In determining whether a statement is valid or not, it can be determined by:

The calculated r value > r table, then the statement is valid

The calculated r value < r table, then the statement is invalid

2.6. Reliability Test

Reliability is a test to measure the extent to which an instrument provides stable and consistent results. This test is important because it refers to the consistency of all instruments (Amalia, R. nur Dianingati, R. setia & Annisaa, 2022). Here is the reliability formula:

$$r_{11} = (n/n-1) (1 - \sum \sigma^2 / \sigma^2)$$

description:

r_{11} : reliability sought

n: number of questionnaire questions

$\sum \sigma^2$: number of score variants for each item

This research variable is said to be valid if Cronbach Alpha > 0.6

2.7. Likert Scale

This study uses a Likert scale in its measurement, in the measurement using a score of 1-5. The Likert scale is used to measure the attitudes, opinions and perceptions of a person or group of people about related phenomena (Mahato, 2021). The measurement of this study is used to measure the response of respondents, namely a scale of 1 (strongly disagree); 2 (disagree); 3 (neutral); 4 (agree); 5 (strongly agree). Each answer given by the respondent will be scored, so that respondents must provide a sign of agreement for positive items and disagree for negative items. The score given to the respondent's answer to the questionnaire will be determined based on the classification of the items as positive or negative:

Table 1. The Likert Scale

No.	Answer	Score
1.	Strongly Agree	5
2.	Agree	4
3.	Netral	3
4.	Disagree	2
5.	Strongly disagree	1

Source: Sugiyono, 2014

2.8. Descriptive analysis

Descriptive analysis is data analysis by changing raw data into a form that is easier to understand and interpret (Sekaran, 2014). In this study, the questionnaire data that has gone through various tests is then classified using a Likert scale assessment interval to measure the respondents' assessment of the questionnaire questions to make it easier to describe whether the questions asked in the questionnaire are classified as "strongly disagree," "disagree," "neutral," "agree," and "strongly agree."

2.9. Job safety analysis (JSA)

Job Safety Analysis is an analysis process that focuses on identifying hazards related to work tasks, with the aim of detecting and identifying potential hazards before incidents or work accidents occur. Job Safety Analysis focuses on the relationship between tasks, workers, tools, and the work environment. Logically, after the identification of unconstrained hazards is carried out,

2. METHODOLOGY

This paper is presented in the form of a flowchart:

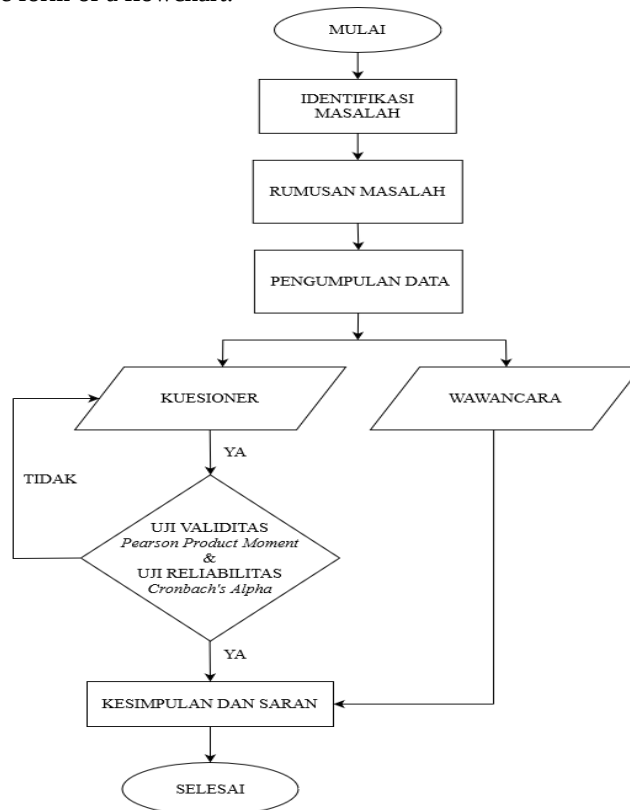


Figure 1. Research Flowchart

The flowchart sequence is explained as follows:

1. Problem identification is carried out as the initial step of the research to explain the problem and make the explanation measurable.
2. In compiling this research, valid data is needed using two methods, namely primary data and secondary data obtained by distributing questionnaires, interviews, and field observations on the construction project of the Sugimanuru Muna Airport Terminal Building, Southeast Sulawesi Province.
3. Data analysis is carried out with two tests, namely, by conducting validity tests and reliability tests.
4. Making conclusions and suggestions from the results of the tests in this study.

3. RESEARCH RESULTS

3.1 Validity test

After the questionnaire was distributed to 18 respondents, the results of the questionnaire were tested for validity to see the feasibility of the questionnaire as a research measuring tool. For the *r* table itself, it can be obtained from the *r* table where the significance value used is 0.05, and then the value of the *r* table obtained is 0.468. The following are the results of the validity test:

Table 2. The Results of the validity test

Questions	Correlation	Results	Remarks
1	Pearson Correlation Sig. (2-tailed) N	.830** <.001 18	Valid
2	Pearson Correlation Sig. (2-tailed) N	.808** <.001 18	Valid
3	Pearson Correlation Sig. (2-tailed)	.808** <.001	Valid

Questions	Correlation	Results	Remarks
	N	18	
4	Pearson Correlation Sig. (2-tailed) N	.826** <.001 18	Valid
5	Pearson Correlation Sig. (2-tailed) N	.857** <.001 18	Valid
6	Pearson Correlation Sig. (2-tailed) N	.890** <.001 18	Valid
7	Pearson Correlation Sig. (2-tailed) N	.704** .001 18	Valid
8	Pearson Correlation Sig. (2-tailed) N	.817** <.001 18	
9	Pearson Correlation Sig. (2-tailed) N	.808** <.001 18	
10	Pearson Correlation Sig. (2-tailed) N	.844** <.001 18	
11	Pearson Correlation Sig. (2-tailed) N	.890** <.001 18	
12	Pearson Correlation Sig. (2-tailed) N	.812** <.001 18	Valid
13	Pearson Correlation Sig. (2-tailed) N	.830** <.001 18	Valid
14	Pearson Correlation Sig. (2-tailed) N	.782** <.001 18	Valid
15	Pearson Correlation Sig. (2-tailed) N	.881** <.001 18	Valid
16	Pearson Correlation Sig. (2-tailed) N	.842** <.001 18	Valid
17	Pearson Correlation Sig. (2-tailed) N	.803** <.001 18	Valid
18	Pearson Correlation Sig. (2-tailed) N	.743** <.001 18	Valid
19	Pearson Correlation Sig. (2-tailed) N	.788** <.001 18	Valid
20	Pearson Correlation Sig. (2-tailed) N	.830** <.001 18	Valid
21	Pearson Correlation Sig. (2-tailed) N	.749** <.001 18	Valid
22	Pearson Correlation Sig. (2-tailed) N	.707** .001 18	Valid
23	Pearson Correlation	.722**	

Questions	Correlation	Results	Remarks
	Sig. (2-tailed) N	<.001 18	<i>Valid</i>
24	Pearson Correlation Sig. (2-tailed) N	.734** <.001 18	<i>Valid</i>
25	Pearson Correlation Sig. (2-tailed) N	.782** <.001 18	<i>Valid</i>
26	Pearson Correlation Sig. (2-tailed) N	.800** <.001 18	<i>Valid</i>
27	Pearson Correlation Sig. (2-tailed) N	.910** <.001 18	<i>Valid</i>
28	Pearson Correlation Sig. (2-tailed) N	.910** <.001 18	<i>Valid</i>
29	Pearson Correlation Sig. (2-tailed) N	.830** <.001 18	<i>Valid</i>
30	Pearson Correlation Sig. (2-tailed) N	.866** <.001 18	<i>Valid</i>
31	Pearson Correlation Sig. (2-tailed) N	.797** <.001 18	<i>Valid</i>

3.2. Reliability test

After that, a reliability test was conducted to assess the level of consistency of respondents in providing answers to the questionnaire. By using the Cronbach's Alpha method to measure the consistency of answers after repeated measurements. The questionnaire is said to be reliable or consistent if the calculation result is greater than 0.60. The following are the results of the reliability test of the questionnaire distributed to 18 respondents and processed in the SPSS application.

<i>Reliability Statistics</i>	
<i>Cronbach's Alpha</i>	<i>N of Items</i>
.983	31

Gambar 4.5 Hasil *reliability statistic*

4. CONCLUSION AND RECOMMENDATION

4.1. Conclusions

Based on the results of the analysis conducted, the conclusions that can be conveyed are as follows:

1. The implementation of K3 in the construction of the terminal building canopy at Sugimanuru Muna Airport, Southeast Sulawesi Province, is included in the "Very Good" category. This is shown in the results of the Likert scale calculation of 4.6.
2. The results of the Likert scale calculation for the implementation of K3 show an average value of 4.66. However, there are still two indicators that get a lower value, namely 4.33. These indicators are "workers feel unsafe when working without using complete personal protective equipment (PPE)" and "the company replaces workers' PPE that is damaged or unusable."

4.2. Suggestions

In this case, suggestions should be given that can be considered in further research for the academic community of Poltekbang Surabaya and for the management of UPBU Sugimanuru Muna in evaluating the implementation of occupational safety and health (K3) in the work environment as follows:

1. The author suggests that airport managers improve the completeness of personal protective equipment (PPE) for workers and replace damaged personal protective equipment (PPE).
2. Airport managers must pay more attention to workers and increase their awareness of the importance of using personal protective equipment (PPE) so that the level of awareness and implementation of K3 (occupational safety and health) is at a higher level.
3. There needs to be a joint commitment from all elements in the implementation of occupational safety and health (K3) in the field in order to reduce or eliminate the risk of work accidents in each project that will be implemented.

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