Relationship Analysis and Effect of Occupational Safety and Health Management System on the Success Of Building Construction Projects In Banda Aceh City

Rinaldy[1], Zulyaden[2]

[1]Department of Civil Engineering, Teuku Umar University, Meulaboh West Aceh, Indonesia
[2] Department of Civil Engineering, Teuku Umar University, Meulaboh West Aceh, Indonesia
Corresponding Author: Rinaldy

Abstract

The construction service industry is one that has a fairly high risk of work accidents. The city of Banda Aceh is one of the cities that is developing in its construction. This can be seen from the large number of construction projects in Banda Aceh City, both currently underway or planned or those that have been completed. In the implementation of the construction of a construction project in the field there is a high risk of work accidents and becomes a serious problem. Therefore, Occupational Safety and Health (K3) is an aspect that must be addressed at any time because it is a very complex problem. This study aims to analyze the relationship and influence between the factors of implementing SMK3 on the success of building construction projects in Banda Aceh City based on contractor perceptions. The observed projects are building construction projects that have been completed in Banda Aceh City starting from 2005-2015. Based on data from the Aceh Province Construction Services Development Institute (LPJK) in 2016, the total population was 102 contractors with Small qualifications, namely K1, K2, K3, medium qualifications, namely M1, M2, and large qualifications, namely B1. Through the Slovin equation, the research sample obtained was 51 contractors. The method used in this study is a combined method, namely qualitative and quantitative methods through the distribution of questionnaires. The independent variables or factors that influence the implementation of the Occupational Health and Safety Management System (SMK3) in this study are the safety factor, the equipment and work clothes factor, the vehicle path factor, the fire factor, the equipment and machinery factor, the electrical and sound factor, the public protection, general factors, occupational health factors, and other factors. While the dependent variable is the success of the project. For statistical analysis of the data process, validity and reliability tests were carried out, while for analyzing the data was carried out using the assistance of Statistical Products and Services Solutions (SPSS) version 22. The relationship between the factors of implementing SMK3 on the success of building construction projects in Banda Aceh City has a relationship partially high with a Pearson correlation coefficient of 0.70-0.80, namely general factors, and other factors. The influence of the factors of implementing SMK3 on the success of building construction projects in Banda Aceh City, the most influential is the general factor, with a regression coefficient value of 0.428. This means that if the general factors are increased, while other factors remain, then the success rate of the implementation of building construction projects in Banda Aceh City will increase.

Keywords: Work accident, K3, Project success, Banda Aceh City, Construction project, SMK3

I. INTRODUCTION

Management system which includes organization, planning, implementation responsibilities, process procedures and resources needed for development, implementation, achievement, assessment, maintenance, OHS policies in order to control risks related to work activities in order to create a safe and productive workplace [1]. This study aims to determine the dominant factors in the application of the Occupational Health and Safety Management System (SMK3) to the succession of building construction projects in Banda Aceh city based on the contractor's perception. Occupational Safety and Health is a protective effort aimed at ensuring that the workforce and other people in the workplace/company are always safe and healthy, and so that every source of production can be used safely and efficiently [2]. The productivity of a job will increase if the volume of work produced increases without increasing working time, the volume of work produced is in accordance with the plan or does not increase but is carried out in a faster time than the predetermined schedule, working time increases resulting in a doubled volume of work. [3].

The factors used in measuring work productivity include quantity of work, quality of work and timeliness [4]. The factors for implementing SMK3 in the implementation of construction projects consist of several factors, including safety factors, equipment and work clothes factors, vehicle path factors, fire factors, equipment and machinery factors, electricity and sound factors, public protection factors, general factors, factors occupational health and other factors [5]. The factors for implementing SMK3 in project implementation can be seen in Table 1.

Table 1: Factors for implementing SMK3

No.	Variable	Source
X_1	Safety Factor	Wisandjojo (2013)
X_2	Equipment and work clothes factors	Wisandjojo (2013)
X_3	Vehicle path factor	Wisandjojo (2013)
X_4	fire factor	Wisandjojo (2013)
X_5	Equipment and machinery factors	Wisandjojo (2013)
X_6	Electric and sound factor	Wisandjojo (2013)
X_7	Public protection factor	Wisandjojo (2013)
X_8	Common factors	Wisandjojo (2013)
X_9	Occupational health factors	Wisandjojo (2013)
X_{10}	Miscellaneous factors	Wisandjojo (2013)

The observed projects are building construction projects that have been completed in Banda Aceh City starting from 2005-2015. Based on data from the Aceh Province Construction Services Development Institute (LPJK) in 2016, the total population was 102 contractors with Small qualifications, namely K1, K2, K3, medium qualifications, namely M1, M2, and large qualifications, namely B1. Through the Slovin equation, the research sample obtained was 51 contractors. The method used in this study is a combined method, namely qualitative and quantitative methods through the distribution of questionnaires. The independent variables or factors that influence the application of the Occupational Health and Safety Management System (SMK3) in this study are the safety factor, the equipment and work clothes factor, the vehicle path factor, the fire factor, the equipment and machinery factor, the electrical and sound factor, the public protection, general factors, occupational health factors, and other factors. While the dependent variable is the success of the project. For statistical analysis of the data process, validity and reliability tests were carried out, while for data analysis was carried out using the help of Statistical Products and Services Solutions (SPSS) version 22.

II. RESULT AND DISCUSSION

This study uses two methods, namely qualitative and quantitative approaches. Qualitative methods are used to obtain respondents' perceptions in the form of words, from the Likert scale used in the questionnaire. In this case the form of the words in question is very not influential, not influential, less influential, influential, and very influential. Quantitative methods are used to get the form of numbers on perceptions obtained from respondents. In this case the form of the number in question is the respondent's answer score starting from 1,2,3,4 and 5 which is then analyzed to obtain R arithmetic, Cronbach Alpha, Pearson correlation coefficient and Regression coefficient values.

2.1 Validity Test

The criteria for assessing this validity test are if Rcount > Rtable then the question item the questionnaire is valid, and vice versa if Rcount > Rtable then the questionnaire question item is not valid [6]. Based on the results of data processing through SPSS software, it shows that all statements contained in the questionnaire are entirely valid. Where all statements in the questionnaire have a value of Rcount > Rtable.

2.2 Reliability Test

The criteria for assessing this reliability test are if Cronbach Alpha > 0.6 then the variable on a reliable questionnaire, and vice versa if Cronbach's Alpha <0.6 then the variable on the questionnaire is not reliable [7]. Based on the results of data processing through SPSS software, it shows that all variables contained in the questionnaire are entirely reliable. Where all the variables in the questionnaire have a Conbrach Alpha value greater than 0.6.

2.3 Simple Correlation Analysis

This simple correlation analysis has an output in the form of a relationship through the magnitude of the Pearson correlation coefficient, and the presence or absence of a relationship through a significant level

<0.05 [8]. The Pearson correlation coefficient which has been analyzed through the SPSS version 22 program, can be shown in Table 2.

Tabel 2: Pearson Correlation Coefficient Value

Relationship Variable	Person Correlation	Form Relationship	Significance
X_1-Y	0,158	Very low	0,269
X_2-Y	0,232	Low	0,101
X_3-Y	0,301	Low	0,032
X_4-Y	0,685	Enough	0,000
X_5-Y	0,276	Low	0,050
X_6-Y	0,455	Enough	0,001
X_7-Y	-0,111	Very low	0,436
X_8-Y	0,707	Tall	0,000
X_9-Y	0,430	Enough	0,002
X_{10}-Y	0,767	Tall	0,000

Based on the Pearson correlation coefficient values that have been analyzed as shown in table 2, there are 2 factors for implementing SMK3 that have a high relationship, 3 factors with a moderate relationship, 3 factors with a low relationship, and 2 factors with a very low relationship to the success of building construction projects. in Banda Aceh City with the following details:

The factors for implementing SMK3 that have a high relationship with the success of building construction projects in Banda Aceh City are:
1. General factors, with a correlation coefficient of 0.707; and
2. Other factors, with a correlation coefficient of 0.767.

The factors for implementing SMK3 that have a sufficient form of relationship to the success of building construction projects in Banda Aceh City are:
1. Fire factor, with a correlation coefficient of 0.685;
2. Electricity and sound factors with a correlation coefficient of 0.455; and
3. Occupational health factor, with a correlation coefficient of 0.430.

The factors for implementing SMK3 that have a low relationship with the success of building construction projects in Banda Aceh City are:
1. Factors of equipment and work clothes, with a correlation coefficient of 0.232;
2. Vehicle path factor, with a correlation coefficient value of 0.301; and
3. Factors of equipment and machinery, with a correlation coefficient of 0.276.

The factors for implementing SMK3 that have a very low relationship to the success of building construction projects in Banda Aceh City are:
1. Safety factor, with a correlation coefficient value of 0.158; and
2. Public protection factor, with a correlation coefficient of -0.111..

2.4 Multiple Linear Regression Analysis

This multiple regression has an output in the form of the most influential factor through the magnitude of the multiple linear regression coefficient [8]. The multiple linear regression coefficients that have been analyzed through the SPSS version 22 program can be seen in Table 3.

Tabel 3: Multiple Linear Regression Output

Variable	Regression Coefficient
Constant	4,386
Safety Factor	-0,129
Factors of equipment and work clothes	0,028
Vehicle path factor	0,177
fire factor	0,136
Equipment and machinery factors	-0,849
Electric and sound factor	0,217
Public protection factor	-0,167
Common factors	0,428
Occupational health factors	0,356
Miscellaneous factors	0,214

Based on the multiple linear regression coefficient values that have been analyzed, there are 7 factors of the implementation of SMK3 that have a positive influence and 3 factors with a negative influence on the success of building construction projects in Banda Aceh City. This positive effect means that if one factor in the implementation of SMK3 is improved, while other factors remain, the success of the project will increase. The negative effect means that if one factor of the implementation of SMK3 is increased, while the other factors remain, the success of the project will continue to decline. The factors of implementing SMK3 that have a positive influence on the success of building construction projects in Banda Aceh City are:

1. General factors, with a regression coefficient of 0.428.
2. Occupational health factor, with a regression coefficient value of 0.356.
3. Electricity and sound factors, with a regression coefficient of 0.217.
4. Other factors, with a regression coefficient of 0.214.
5. Vehicle path factor, with a regression coefficient value of 0.177.
6. The fire factor, with a regression coefficient of 0.136.
7. Factors of equipment and work clothes, with a regression coefficient of 0.028.

The factors for implementing SMK3 that have a negative influence on the success of building construction projects in Banda Aceh City are as follows.

1. Equipment and machinery factors, with a regression coefficient of -0.849.
2. Public protection factor, with a regression coefficient of -0.167.
3. Safety factor, with a regression coefficient of -0.129.

III. CONCLUSION

The relationship between the factors of implementing SMK3 on the success of building construction projects in Banda Aceh City has a high partial relationship with the Pearson correlation coefficient value of 0.70-0.80, namely general factors, and other factors. Factors that have a fairly partial relationship with the Pearson correlation coefficient value of 0.40-0.70, namely fire factors, electricity and sound factors, and occupational health factors. Factors that have a low partial relationship with the Pearson correlation coefficient 0.20-0.40 are equipment and work clothes factors, vehicle path factors, and equipment and machinery factors. While the factors that have a very low relationship partially with the Pearson correlation coefficient value -0.10-0.20, namely the safety factor, and the public protection factor. The influence of the factors of implementing SMK3 on the success of building construction projects in Banda Aceh City, the most influential is the general factor, with a regression coefficient value of 0.428. This means that if general factors are increased, while other factors remain, the success of building construction projects in Banda Aceh City will increase.

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