

# Analysis of Occupational Safety on Workers Performance on X Project Surabaya

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**Abstract:-** In every good working environment should prioritize the safety and health of its workers properly and reasonably. In the world of construction, especially high rise building is needed the safety program. Occupational Safety and Health nowadays is not only implemented in the course but starting from the preparation, implementation until the end of work. However, in its implementation, there are few obstacles because there are still many human resources, especially in the limited project area, in understanding the implementation so that the work safety program is not yet a top priority. If these conditions are allowed to continue, the risk of work injury will certainly continue to grow. So to find out what factors make the construction project area is still not optimal to implement the safety program, the researcher highlighted the case on mixed use development project as high as 37 floors and with the development time targeted quickly and on time. So what is the most appropriate factor to improve the implementation of safety on the performance so that the work can be completed according to planned and timely results.

The data collected in this research is quantitative using survey for workers in construction area of X Surabaya Project who are in the field everyday. The number of samples is 85 respondents from 243 people, then only a part of the population. The independent variables consist of Top Management Commitment (X1), Personal Protective Equipment (X2), Supervision (X3), and Awareness (X4) while the dependent variable is Performance (Y). Data is processed using validity test and reliability test, while the method of data analysis using multiple linear regression and FGD method, firstly the validity and reliability using SPSS statistical program.

The results of this research indicate what safety measures are most influential and should be considered in the implementation of Occupational Safety in the area X Surabaya Project. Occupational safety factors that significantly affect the worker's performance are Personal Protective Equipment (PPE). Then reanalyzed with Focus Group Discussion (FGD) in order to find a best solution in the implementation of Occupational Safety so that it can be a revamping in the company's performance in the future.

**Keywords:-** Occupational Safety, Multiple Regression Analysis, Construction, High Rise Building, Focus Group Discussion.

## I. INTRODUCTION

The environment condition and occupational culture of the worker which support in both management and systematic governance as well as non-technical matters such as the solidarity of fellow employees are the reasons for researchers to conduct research in this project area. The rapid development of the construction industry besides providing benefits also cause a risk. The construction industry has considerable risk which can be said to be the most vulnerable for occupational accidents. The possibility of accidents in the construction project will be one cause of disruption or cessation of project activities. Therefore, at the time of construction work is required to implement an Occupational Safety and Health Management System (OHSMS) at the work site where the safety and health issues are also part of project plan and control, Ervianto (2005).

At Xiangou Wu (2015), the most influential occupational safety is performance of company management regulation seen from the number of accident in the construction industry. Murat Gunduz (2018), show that the most important of occupational safety is the use of Personal Protective Equipment and Safety Procedure & Regulation. Ali Bavafa (2017), revealed that commitment and supervision of occupational safety are central for performance. From some of the research, the researcher pulled the title of this research to find the safety factor which influence the performance of each worker, in the form of preventive or prevention starting from the beginning of the project, it will be better and minimally work accident.

From the background that has been described above can be formulated the problem of this research is:

- Which occupational safety factors are most influential on worker performance in X Surabaya building project?
- How to improve occupational safety to support performance improvement?

The research objectives to be achieved, namely as follows:

- To find out what safety factor which most influential on performance in X Surabaya Project.
- To optimize and know what the best steps taken company especially in the field of safety.

This Research of Occupational Safety Analysis on Worker Performance in X Surabaya Project is focused only on the implementation of occupational safety program by analyzing top management commitment indicators, Personal

Protective Equipment (PPE), monitoring and awareness in implementing safety program how the effect on the performance of workers in X Surabaya Project. Worker performance analyzed includes indicators that affect worker performance, that are: quality and quantity. Then look for the weakness and strength of the company that is the main contractor and the opportunities and threats that exist in the company so that companies can take the best step.

## II. LITERATURE REVIEW

Paramita (2012) show that occupational safety is to create safe conditions equipped with safety equipment, good lighting, maintain floors, stairs and project areas that free of water, oil, mosquitoes and maintain water facilities properly. Based on some previous research, it can be concluded that Occupational Safety and Health can be formed from several dominant factors, as follows:

- Top Management Commitment
- Personal Protective Equipment
- Supervision
- Awareness

### A. *Factor of Top Management Commitment to Performance*

The role of management must go beyond the regulation and provision of safety policies and work instructions. Several studies have shown that commitment and management involvement in safety are the most important factors for satisfactory safety levels, Jaselskis et al. (1996).

### B. *Factor of Personal Protection Equipment to Performance*

Personal Protective Equipment (PPE) is a set of safety tools used by workers to protect the whole or part of the body from possible potential hazards of work environment against accidents and illnesses due to work, Tarwaka (2014).

The purpose of the use of Personal Protective Equipment (PPE) is to protect the body from work hazards that may lead to illness or accidents, so the use of personal protective equipment holds an important role.

### C. *Factor of Supervision to Performance*

The purpose of supervision is to improve the performance of the organization sustainably, as the increasingly competitive conditions demanding the organization to monitor its performance at all times, then increase the efficiency and profitability of the organization by eliminating unnecessary work or reducing the misuse of tools or materials, assessing the degree of achievement of the work plan with actual results are achieved and can be used as a basis for compensation for an employee, coordinate some elements or programs that run, and increase the linkage to organizational goals to achieve (Odgers, 2007).

### D. *Factor of Awareness to Performance*

Concepts of awareness are including attitudes and behaviors. Attitudes are views or feelings accompanied by a tendency to act according to the attitude of the object, whereas behavior is a movement that can be observed from outside Kohnstamm & Palland (1984) and Yang (1994). From the concept can be concluded that the relationship between attitudes and behavior can occur when the individual is taking action against in an environment.

### E. *Performance*

According to the behavioral approach in management, performance is the quantity or quality of the resulting product or service provided by a person who carries out the work, Luthans (2005). Performance is an achievement of work, namely the comparison between the work with the specified standards, Dessler (2000). Performance is the result of work both in quality and quantity achieved by a person in performing the role according to the responsibilities given, Mangkunegara (2002).

Performance is the result or level of success of a person as a whole over a certain period in performing the role that comparison with a lot of possibilities, such as predetermined work standards, targets or goals or criteria have been agreed, Rivai and Basri (2005).

Accorde at Tiffin and Mc. Cornick (2011), there are 2 variables that can affect the performance, that is.

A. Individual Variables, including: attitudes, characteristics, physical characteristics, interests and motivation, experience, age, gender, education, and other individual factors.

B. Organizational Variables

- Physical and occupational factors, consisting of: working methods, conditions and design of work equipment, spatial arrangement and physical environment (irradiation, temperature, and fertilasi).
- Social and organizational factors, including: organizational rules, organizational nature, type of training and supervision, wage system and social environment.

Davis and J. Newstrom (1989) argue that performance is influenced by two factors:

A. *Ability Factor*

- Knowledge: education, experience and practice.
- Skills: proficiency and personality.

B. *Motivation Factor*

- Social condition: formal and informal organization, leadership.
- Unions need physiological, social and egoistic needs.
- Physic condition: work environment.

From the various opinions of these experts, then in accordance with this study, the performance of workers in general is influenced by two main factors namely organizational and individual variables.

**F. Linier Multiple Regression**

According to Gujarati (2003), assumptions in model of linear multiple regression are:

- Regression model is linear on parameter
- Averages value of error is zero
- Variant of error is constant
- No Autocorrelation in error
- No Multicollinearity in free variable
- Distribution of error is normal

**III. MATERIALS AND METHODS**

**A. Population and Sample**

In this research, the mean of population is the worker who work in X Surabaya Area Project are 243 people.

Sampling Methode that use in this research is Simple Random Sampling Technique that is simply sampling technique. The required sample consisted of members who were in sections of the worker population of X Surabaya Project who are randomly selected as many as 85 respondents.

*Flowchart*

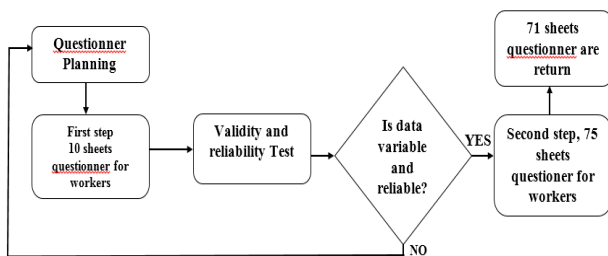
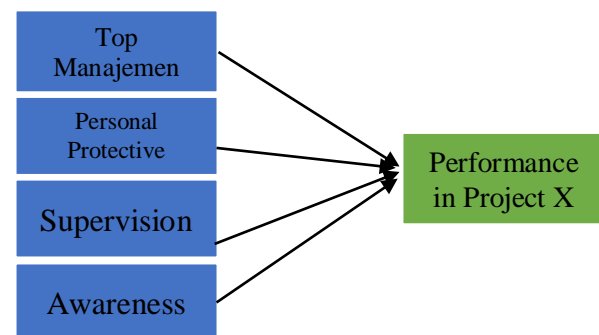


Fig 1:- Flowchart Data Search



Research Model

Fig 2:- Research Model

**B. Distribution of Questionnaires**

The Purpose of Questionnaires is to find out firsttime the effect of Occupational safety about worker performance. Respondents who fill the questionnaires are parts involved directly in project, like a Helper and Foreman. The questionnaire data processing technique with *likert* scale is used to measure attitudes, opinions, and perceptions of someone about the incident or social phenomenon, Riduwan (2003).

Alternative Answer	Score
Very Agree	5
Agree	4
Hesitant	3
Not Agree	2
Very not agree	1

Table1. Likert Scale

**• The Purpose and Hypothesis of Research**

The hypothesis for this research according to identification of problem, that is:

- T-1: How does the X1 Variable affect to Y?  
 H0 = X1 Variable (Top Management Commitment)have a significant affect to Y Variable (Performance).  
 H1 = X1 Variable (Top Management Commitment) have no a significant affect to Y Variable (Performance).
- T-2.: How does the X2 Variable affect to Y?  
 H0 = X2 Variable (Personal Protective Equipment) have a significant affect to Y Variable (Performance).  
 H2 = X2 Variable (Personal Protective Equipment) have no a significant affect to Y Variable (Performance).
- T-3. : How does the X3 Variable affect to Y?  
 H0 = X3 Variable (Supervision) have a significant affect to Y Variable (Performance).  
 H3= X3 Variable (Supervision) have no a significant affect to Y Variable (Performance).
- T-4. : How does the X4 Variable affect to Y?  
 H0 = X4 Variable (Awareness) have a significant affect to Y Variable (Performance).  
 H4 = X4 Variable (Awareness) have no a significant affect to Y Variable (Performance).
- T-5. : How does all variables X1, X2, X3, X4 affect to Y?  
 H0 = X1 Variable (Top Management Commitment), X2 (Personal Protective Equipment), X3 (Supervision) and X4 (Awareness) have a significant affect to Y Variable (Performance).  
 H5 = X1 Variable (Top Management Commitment), X2 (Personal Protective Equipment), X3 (Supervision) and X4 (Awareness) have no a significant affect to Y Variable (Performance).

**IV. RESULTS**

**A. Validity and Reliability Test**

• **Validity Test**

This tool analysis which for validity test using by SPSS software. The results shows on Table 2:

Variable	Item	r- arithmetic	r-table	Status
Top Management Commitment (X1)	X1.1	0,632	0,6319	Valid
	X1.2	0,782	0,6319	Valid
	X1.3	0,680	0,6319	Valid
	X1.4	0,632	0,6319	Valid
	X1.5	0,680	0,6319	Valid
	X1.6	0,680	0,6319	Valid
	X1.7	0,634	0,6319	Valid
Personal Protective Equipment (X2)	X2.1	0,762	0,6319	Valid
	X2.2	0,676	0,6319	Valid
	X2.3	0,655	0,6319	Valid
	X2.4	0,923	0,6319	Valid
	X2.5	0,836	0,6319	Valid
	X2.6	0,646	0,6319	Valid
Supervision (X3)	X3.1	0,745	0,6319	Valid
	X3.2	0,761	0,6319	Valid
	X3.3	0,811	0,6319	Valid
	X3.4	0,761	0,6319	Valid
	X3.5	0,659	0,6319	Valid
	X3.6	0,813	0,6319	Valid
	X3.7	0,761	0,6319	Valid
Awareness (X4)	X4.1	0,661	0,6319	Valid
	X4.2	0,661	0,6319	Valid
	X4.3	0,742	0,6319	Valid
	X4.4	0,700	0,6319	Valid
	X4.5	0,640	0,6319	Valid
	X4.6	0,744	0,6319	Valid
	X4.7	0,661	0,6319	Valid
	X4.8	0,700	0,6319	Valid
	X4.9	0,658	0,6319	Valid
Performance (Y)	Y1.1	0,782	0,6319	Valid
	Y1.2	0,782	0,6319	Valid
	Y1.3	0,782	0,6319	Valid
	Y1.4	0,729	0,6319	Valid

Tabel 2. Results of Validity Test

Source: The Result of This Research, 2018

From the table above shows tha all the r value (probability) on standard (r-table) so all questions are valid.

• **Reliability Test**

Variable	Alpha Cronbach	Critical Number	Comment
Top Management Commitment	0,721	0,600	Reliable
PPE	0,687	0,600	Reliable
Supervision	0,679	0,600	Reliable
Awariness	0,649	0,600	Reliable
Performance	0,736	0,600	Reliable

Table 3. Result of Realibility Test

Source: The Result of This Research, 2018

Based on the results of the regression calculation in table 4, it show that the VIF already qualified (VIF <10), it can be a regression equation that represents the relationship between top management commitment, personal protective equipment,Supervision, awareness to performance, that is:  
 $Y = 2,450 - 0,132X_1 + 0,317X_2 - 0,135X_3 + 0,222X_4 \dots \dots \dots (4.1)$

Model	Unstandardized Coefficients		Standar dized Coefficients	t	Sig. 1.775
	B	Std. Error			
1 (Constant)	2.450	1.380		1.775	0.080
Top Management Commitment	-0.132	0.086	-0.183	-1.531	0.130
Personal Protective Equipment	0.317	0.066	0.509	4.825	0.000
Supervision	-0.135	0.057	-0.255	-2.383	0.020
Awareness	0.222	0.063	0.468	3.547	0.001

Tabel 4. Table of Regression Analysis

**B. Hypothesis Test**

• **F Test (Simultant)**

First hypothesis test using F Test to test the independent variables to dependent at the same time. This test is done by comparing value of F Count and F Tabel with calculate use Anova on SPSS. The test result of F Count with variables (Top Management Commitment, Personal Protection Equipment, Supervision, Awareness, Performance), as follows:



Hypothesis	Value	Stats
H0 = X1, X2, X3 and X4 have no a significant affect to Y as simultanly	F tabel 2,33	H1 is Accepted
H1 =X1, X2, X3 and X4 have a significant affect to Y as simultanly	F count 14,164 Sig. F 0,000	

Tabel 5. Result of Anova Test (F Test)

Test Result of simulant above earned the value of F Count is 14,164. This value is bigger than the value of F Tables (14,164 > 2,33) and value of Sig. F is lower than  $\alpha$  (0,05), so H1 is acceptable.

• *T Test (Partial)*

Calculation Result of T Test (Partial) with Top Management Commitment as Variable to Performance can be seen at Table 6.

Hypothesis	Score	Status
H1 = Variable (X1) have a significant affect to Y	t tabel = 1,9904 t count = -1,531 Sig t = 0,130	H1 is Rejected

Table 6. Result of T Test (Partial),Top Management Commitment Variable

Calculation Result of T Test (partial) with Personal Protection Equipment (PPE) as Variable to Performance can be seen at Table 7.

Hypothesis	Score	Status
H2 = Variable (X2) have a significant affect to Y	t tabel = 1,9904 t count = 4,825 Sig t = 0,000	H2 is Accepted

Table 7.Result of T Test (Partial),PPE

Calculation Result of T Test (partial) with Supervision as Variable to Performance can be seen at Table 8.

Hipotesis	Score	Status
H3 = Variable (X3) have a significant affect to Y	t tabel = 1,9904 t count = -2,383 Sig t = 0.020	H3 is Accepted

Tabel 8. Result of T Test (Partial), Supervision

Calculation Result of T Test (partial) with Awareness as Variable to Performance can be seen at Table 9.

Hypothesis	Value	Stats
H4 = Variable (X4) have a significant affect to Y	t tabel = 1,9904 t count = 3,547 Sig t = 0,001	H4 is Accepted

Tabel 9:- Result of T Test (Partial), Awareness

• *Coefficient of Determination(R<sup>2</sup>)*

Coefficient of Determination (R<sup>2</sup>) is used to know the amount of contribution or donation from overall independent variables to linear equations. Coefficient of determination in this research is searched on Variables of Occupational Safety.

• *Coefficient of Determination(R<sup>2</sup>) of Occupational Safety*

There is a Coefficient of Determination(R<sup>2</sup>) with Top Management Commitment, PPE, Supervision, and Awareness to Performance of Worker.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.654 <sup>a</sup>	.427	.397	1.73732
a. Predictors: (Constant), Kesadaran, APD, Pengawasan dan Komitmen				
b. Dependent Variable: Kinerja				

Tabel 10.Coefficient of Determination(R<sup>2</sup>) of Occupational Safety

• *Model Summary*

The Contribution of Top Management Commitment (X1), PPE (X2), Supervision (X3), and Awareness (X4) as Variable that have a affect to Performance of Worker (Y), while the rest is affected by other variables which is not included to the Model. The Value of R Square in this research is 0,427.

• *Discusison about Analysis Result of Multiple Linier Regression*

Test Result of F with Top Management Commitment, PPE, Supervision, and Awareness as Variable have a significant affect to Performance, so can be said that Performance is affected by Condition that include Top Management Commitment, PPE, Supervision, and Awareness.

For Test Result of T, only Top Management Commitment and Supervision have no a significant and negative effect to Performance. From the result can be said that Performance is not affect by Top Management Commitment and Supervision are held is X Surabaya Project. From this result can be indicated that Personal Protection Equipment (PPE) and Awareness that must be considered as important things on Occupational Safety in X Surabaya Project.

From the value of Determination Coefficient (R Square) obtained number is 0,427. The mean of that number is Top Management Commitment, PPE, Supervision, and Awareness as Variable that have a affect to Performance is 42,7% while the remaining 57,3% is affected by the other Variables that exist outside this Regression Models.

Summary of Analysis Affect from Variables (Top Management Commitment, PPE, Supervision, Awareness) to Performance can be seen at Table 11 as follows:

Model	Regression Coefficient	t	Sig.
1 (Constant)	2.450	1.775	.080
Top Management Commitment	-.132	-1.531	.130
PPE	.317	4.825	.000
Supervision	-.135	-2.383	.020
Awareness	.222	3.547	.001

Tabel 11. Summary of Regression Analysis

Source: Result of this research, 2018

## V. CONCLUSION

Base don several data processing and analysis that done on this research, so the conclusion that can be taken are follows:

- Through Test of F and T use the Multiple Regression Analysis Methods, obtained result that Variable of Occupational Safety which have a significant affect to Performance is Personal Protection Equipment, while that have no a significant affect are Top Management Commitment, Supervision, and Awareness. From Result Analysis obtained Coefficient of Determination (R Square) is 0,427. The mean of Number is The Variable have a significant to Performance is 42,7% while the remaining 57,3% is affected by the other Variable that exist outside this Regression Model.
- From the prosses of Focus Group Discussion, Phase I and II, obtained result that Personal Protection Equipment. Because for participant, the Safety Responsibility starts from ourself. Then to optimaze Performance by Improving Personal Protection Equipment which sorted by value on each supports factor that become the problem and then the highest level of importance are.
  - a. Trainer: Firstly, Company choose the criteria of trainer that comply standard, then set cost to be fair fee for trainer and held a recruitment after planning the training for worker and determine the time.
  - b. Training: Make a focus training for worker like the moment Safety Morning will be held more attractive. Example, serve the consumption, communicate friendly but serious. So worker are interested to join Safety Morning.

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