JWC JOURNAL OF WORLD CONFERENCE
VOLUME 4 | NUMBER 4 | JULY 2022
Available online at http://proceedings.worldconference.id.
ISSN: 2656-1174 (online)

Level of Success Practice of Occupational Safety Risk Management in Implementation of the Suramadu Bridge Inspection and Planning Project

Moch Riza, Ronny Durrotun Nasihien
Department of Civil Engineering, Narotama University Surabaya, Indonesia
rizamoch@gmail.com, ronny.durrotun@narotama.ac.id

Abstract
The Suramadu Bridge Inspection and Planning Project is a construction management consulting project with a high risk of work in planning. In response, a study was conducted that aims to measure the success of the implementation of construction safety management to identify weaknesses in operational performance on the Suramadu Bridge Inspection and Planning project. This study uses an interview method through a questionnaire sheet to the stakeholders involved based on the Regulation of the Minister of Public Works and Public Housing Number 10 of 2021. The data obtained is then processed using SPSS software with a scoring method. Based on the results obtained in this study, it can conclude that the successful implementation of the Construction Safety Management System (SMKK) in the Implementation of the Suramadu Bridge Inspection and Planning Project reached a value of 83.73%, with the level of achievement classified in the Good category. In contrast, the dominant factor influencing the implementation of SMKK is construction safety planning which has the highest level of achievement of 86.88%. However, what needs more attention is the evaluation of construction safety performance with an achievement rate of 80.00%.

Keywords:
The Successful Implementation of Construction Safety Management, SMKK, Regulation of the Minister of Public Works and Public Housing Number 10 of 2021, Weighting Method.

1. Introduction
The Suramadu Bridge Inspection and Planning Project is a construction management consulting project that has a high risk of work in planning. One of the reasons for this is the scope of the designer's responsibilities, including a statement in the event of a design revision. Besides that, special methods are also needed in the inspection and planning of this 5,381-meter-long bridge that is above the Madura Strait.

To realize construction safety which ensures the safety of construction engineering and labor as well as public and environmental safety, an evaluation of the implementation of construction safety risk management is carried out in the implementation of the Suramadu Bridge Inspection and Planning project with reference to the Regulation of the Minister of Public Works and Public Housing Number 21 of 2021.

2. Literature Review
1.1. Construction Project Risk Management
The hazard identification specified in the section/ element must be assessed for its level of risk. It is to determine the possibility of construction errors and work accidents to control these risks can be controlled. Efforts to minimize these risks include:

1. Identify potential sources of danger;
2. Conduct an assessment of the risks that will potentially occur;
3. Carry out control actions by controlling all activities in accordance with the risk identification that has been prepared;
4. Implement and maintain procedures in planning work areas, processes, and other installations;
5. Carry out design and engineering in stages starting from development, verification, and validation; and
6. Overall administrative control.

1.2. Construction Safety Management System (SMKK)
1. SMKK, according to Permen PUPR No. 10 of 2021, is part of the management system for implementing Construction Works to ensure the realization of Construction Safety.
2. The principles of implementing SMKK according to PUPR Ministerial Regulation No. 10 of 2021 include: SMKK must be applied to all implementation of Construction Services;

a. The implementation of SMKK in the conceptual Draft document of SMKK, RKK, RMPK, Quality Program, RKPPL, and RMLLP is carried out based on duties, responsibilities, and authorities;
b. Standards of security, safety, health, and sustainability absolutely must be carried out in the implementation of SMKK;
c. Compliance with security, safety, health, and sustainability standards must ensure safety in construction engineering, occupational health, public, and the environment.

1.3. Construction Safety Risks

1. High hazardous nature based on the assessment of the level of risk in the RKK determined by the Service User based on calculations;
2. Construction work with HPS value above Rp100,000,000,000.00 (one hundred billion rupiah);
3. Employing a construction workforce of more than 100 (one hundred) people;
4. Using equipment in the form of lift aircraft;
5. Using blasting methods and causing explosions;
6. Construction work that uses high technology.

1.4. Assessment of SMKK Implementation Level

The assessment is carried out through an SMKK audit. The SMKK audit criteria, according to the PUPR Ministerial Regulation No. 10 of 2021 there are 5 (five) elements, which are described in Table 1 below..

Table 1. Assessment of SMKK Implementation Level

No.	Level	Assessment of SMKK Implementation		
		0-59% Poor	60-84% Good	85-100% Satisfactory
1.	Worker leadership and participation in construction safety			
2.	Construction safety planning			
3.	Construction safety support			
4.	Construction safety operation			
5.	Construction safety performance evaluation			

3. Methodology

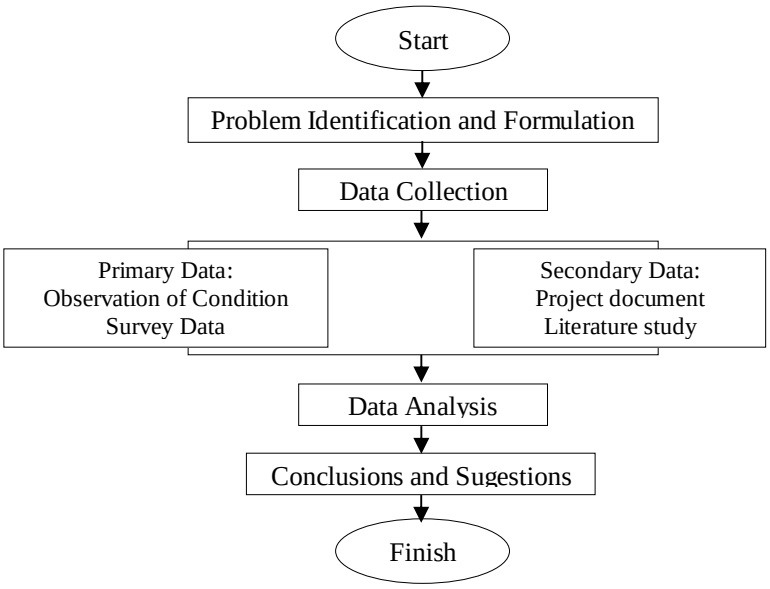

Figure 1. The research method

The research method used is the descriptive qualitative method. Illustrating is a method of describing a problem that is done by collecting data and information about a situation that is currently happening. At the same time, qualitative is a way of presenting a problem.

The research data collection is in the form of observations and interviews based on Regulation of the Minister of Public Works and Public Housing Number 10 of 2021. The interview technique applied in this research is structured interviews, namely data collection techniques that already know the information to be obtained (Sugiyono, 2009). Respondents who were interviewed were those involved and responsible for the

project on the object of this research at the level of service users and service providers. The research instrument used is a questionnaire containing 40 questions distributed to 25 respondents.

The research variables used were 5 (five) variables consisting: (i) leadership and worker participation in construction safety; (ii) construction safety planning; (iii) construction safety support; (iv) construction safety operations; and (v) evaluation of construction safety performance.

The validity test in this study uses validity and reliability tests with the help of SPSS software, with the following test stages:

Stages of validity testing with the following steps:

a. Define the concept operationally to be measured.
b. Conduct a trial of the measurement scale resulting from the first step to several respondents.
c. Prepare an answer tabulation table.
d. Calculate each statement's correlation with the total score using the product moment correlation technique formula.

Formula used:

$$x = \frac{n\sum xy - \sum x \sum y}{\sqrt{\{n\sum x1^2 - (\sum x1\ )^2 - (n\sum y1^2 - \sum y1\ )\ \}}}$$

……(1)

where:
r = correlation coefficient
y = worker productivity
x_i = independent variable element
n = number of data

Stages of reliability testing with the following steps:

The data to be processed is entered through the Data Editor menu, which automatically appears on the screen when SPSS is run.

The data that has been inputted is then processed also through the *Data Edit* menu.

The results of data processing appear on another screen from SPSS, namely the *Output Navigator*.

Furthermore, the analysis of the questionnaire results using the weighting method (Scoring). The assessment score in the questionnaire uses a Likert scale. This scale is used to complete the questionnaire indicating the level of agreement with the questions. The Questionnaire Rating Scale can be seen in Table 2 below.

Table 2. Questionnaire Rating Scale

No.	Assesment	Scale	Score
1.	Very High	5	81-100
2.	High	4	61-80
3.	Normal	3	41-60
4.	Low	2	21-40
5.	Very Low	1	0-20

The formula for the total score of the questionnaire:

$$x = \frac{\text{Total score from data collection}}{\text{total highest score}} \text{ x } 100$$ ……(2)

After obtaining the percentage value, it is determined that the category of application level in the project is included in the classification of SMKK success based on PUPR Ministerial Regulation No. 10 of 2021, according to the table below:

Table 3. Classification of the success rate of SMKK implementation

No.	Value (%)	Category
1.	85 – 100	The applicability rating is satisfactory
2.	65 – 84	The applicability rating is good
3.	0 – 64	The level of application assessment is less

4. Result And Discussion

1. The validity test results on the tabulation of the questionnaire were 5 (five) variables and 25 respondents. Testing the validity of the data in this study was carried out statistically using the construct validity approach of the Pearson Correlation method. The research instrument is valid if *r Count > r Table*.
   a. Variable of Worker leadership and participation in construction safety

Table 4. Worker leadership and participation in construction safety Validity Test Results

Items	r Count	r Table	Remark
X01	0,835	0,396	Valid
X02	0,706	0,396	Valid
X03	0,418	0,396	Valid
X04	0,756	0,396	Valid
X05	0,790	0,396	Valid
X06	0,700	0,396	Valid
X07	0,766	0,396	Valid
X08	0,906	0,396	Valid
X09	0,917	0,396	Valid
X10	0,720	0,396	Valid

Source: Data Processed Results (2022)

   b. Variable of Construction safety planning

Table 5. Construction safety planning Validity Test Results

Items	r Count	r Table	Remark
X11	0,613	0,396	Valid
X12	0,707	0,396	Valid
X13	0,802	0,396	Valid
X14	0,845	0,396	Valid
X15	0,811	0,396	Valid

Source: Data Processed Results (2022)

   c. Variable of Construction safety support

Tabel 6. Construction safety support Validity Test Results

Items	r Count	r Table	Remark
X16	0,783	0,396	Valid
X17	0,902	0,396	Valid
X18	0,811	0,396	Valid
X19	0,858	0,396	Valid
X20	0,888	0,396	Valid

Source: Data Processed Results (2022)

   d. Variable of Construction safety operation

Tabel 7. Construction safety operation Validity Test Results

Items	r Count	r Table	Remark
X21	0,819	0,396	Valid
X22	0,719	0,396	Valid
X23	0,899	0,396	Valid
X24	0,868	0,396	Valid
X25	0,920	0,396	Valid
X26	0,905	0,396	Valid
X27	0,879	0,396	Valid
X28	0,929	0,396	Valid
X29	0,931	0,396	Valid
X30	0,841	0,396	Valid

Source: Data Processed Results (2022)

e. Variable of Construction safety performance evaluation

Table 8. Construction safety performance evaluation Validity Test Results

Items	r Count	r Table	Remark
X31	0,937	0,396	Valid
X32	0,937	0,396	Valid
X33	0,813	0,396	Valid
X34	0,899	0,396	Valid
X35	0,789	0,396	Valid
X36	0,866	0,396	Valid
X37	0,791	0,396	Valid
X38	0,939	0,396	Valid
X39	0,727	0,396	Valid
X40	0,588	0,396	Valid

Source: Data Processed Results (2022)

2. The reliability test results indicate a construct or variable is said to be reliable if it gives a Cronbach Alpha value > 0.6. The results of this test are illustrated in Table 9 below.

Tabel 9. Results of Research Instruments Reliability Test

Variables	*Cronbach's Alpha*	Remark
Worker leadership and participation in construction safety	0,931	Reliable
Construction safety planning	0,839	Reliable
Construction safety support	0,910	Reliable
Construction safety operation	0,969	Reliable
Construction safety performance evaluation	0,954	Reliable

Source: Data Processed Results (2022)

3. Perform the weighting method (scoring) by calculating the average answer based on the scoring of each answer from the respondent. The scoring results can be seen in Table 10 below.

Table 10. Recapitulation of Evaluation Results of the Implementation of SMKK

Variables	Implementation Achievement Rate Score (%)	Category
Worker leadership and participation in construction safety	85,44 %	Satisfactory
Construction safety planning	86,88 %	Satisfactory
Construction safety support	82,72 %	Good
Construction safety operation	83,60 %	Good
Construction safety performance evaluation	80,00 %	Good

Source: Data Processed Results (2022)

From the test results above, the level of achievement of the implementation of SMKK on the Suramadu Bridge Inspection and Planning project as a whole reached a score of 83,73% in the Good category.

5. Conclusion And Suggestions

Based on the results obtained in this study, it can be concluded that the successful implementation of the Construction Safety Management System (SMKK) in the Implementation of the Suramadu Bridge Inspection and Planning Project reached a value of 83.73% with the level of achievement classified in the Good category. In comparison, the dominant factor that influences the implementation of SMKK is construction safety planning which has the highest level of achievement of 86.88%. However, what needs more attention is the evaluation of construction safety performance with an achievement rate of 80.00%.

However, in order to maintain and improve the implementation of the existing SMKK, it is necessary to carry out regular internal audits by the company to ensure that all levels actually implement the implementation of the SMKK within the organization. Recommendations for further research can be made on types of strategic construction projects such as projects, toll roads, and border roads.

References

Sugiyono. (2009). Memahami Penelitian Kualitatif. Alfabeta.