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RISK ANALYSIS ON THE IMPLEMENTATION OF THE CONSTRUCTION PROJECT OF THE HIGH PROSECUTOR'S OFFICE OF SOUTH KALIMANTAN PROVINCE (CONTINUED)

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ABSTRACT

The change in the status of the capital city of South Kalimantan province has implications for the development of urban infrastructure. Various construction works are being carried out, such as the construction of buildings, roads, and bridges. In the implementation of a construction project, of course, there is never a risk that can hinder the implementation process wherever the project is carried out. For example, the South Kalimantan Provincial High Prosecutor's Office (Continued) project is one of the medium-risk projects.

The method used for this risk analysis is to use a quantitative research method with validity and reliability tests. Then analyze *the Probability and Impact* data using the Severity *Index calculation*, which further determines the level of risk with *the Matrix Probability and Impact.* Then categorize these risk variables into risk acceptance scales in order to obtain the dominant risk variables that occur in the project.

The results of the research from the risk analysis on the Implementation of the South Kalimantan Provincial High Prosecutor's Office Development Project (Continued) obtained 15 valid risk variables. There were 11 dominant risk variables with *medium* categories and 3 risks with *high* categories that affected the project

Keywords: Risk, Risk Analysis, Building, *Severity Index*

1. INTRODUCTION

The status of Banjarbaru City replacing Banjarmasin City as the capital of South Kalimantan province has been determined based on the regulations of Law Number 8 Article 4 of 2022. This changing situation has implications for the development of urban infrastructure. Various construction works are being carried out, such as the construction of buildings, roads, and bridges. Therefore, faster working hours and a more skilled workforce are needed to accelerate development. In the implementation of a construction project, of course, there will be

obstacles in its implementation. There are three obstacles to project implementation in the construction realm, namely cost, time, and quality. In addition, every construction project implementation is never spared from the so-called risks that can hinder the implementation process wherever the project is carried out. Therefore, the risk analysis in the construction of the South Kalimantan Provincial High Prosecutor's Office (Continued) is very important to minimize risks and can be handled in ongoing construction projects.

2. THEORETICAL FOUNDATIONS

Validity Test

According to Sugiyono (2017: 125), the validity test was carried out to find out whether the data obtained from the research was valid data or not, using the measuring tools applied (questionnaire).

Reliability Test

Reliability is an indicator that indicates the extent to which a measuring instrument can be trusted. . (Pindonta Ginting & Pontan, 2021)

Severity Index Method

The results of this method calculation are more precise and stable for respondents' answers, namely in the form of percentages. The higher the percentage value of a risk variable, the more dominant the risk will be. The advantage of this method is that it can make it easier to classify these risks (AlHammad, 1996).

Probability and Impact Matrix

The probability *and impact matrices* are a measure of the level of risk. The risk level is a multiplication between *the probability* score and the impact *score* obtained from the respondents (Rahman & Tjendani, 2022).

Risk Response

Risk response is a step made to handle risks that may occur in a construction project (Flanagen & Norman, 1993).

3. METHOD

Research Location

This research was carried out in the construction project of the South Kalimantan High Prosecutor's Office (Continued) located on Jl. Dharma Praja, South Kalimantan Provincial Government Office Area.

Research Procedure

In this study, the author conducted observations, interviews, and provided questionnaires to 11 respondents from PT. Cipta Vera Mandiri and PT. Delta Buana Consultants. After all the data was obtained, it was then processed by testing the validity and reliability using SPSS and analyzing using the *Severity Index* Method and *Probability and Impact Matrix*. The data that has been processed will be handled risk.

4. RESULTS AND DISCUSSION

From the results of risk identification, the risks identified in the construction project of the South Kalimantan Provincial High Prosecutor's Office (Continued) have 15 risk variables and 10 types of risk sources as shown in the following table:

Table 1. Risk Variables

No.	Source of Risk	Risk Variables
1	Politics	Government Policy
2	Milieu	Noise caused by the use of heavy equipment
		Air/dust pollution
3	Planning	Schedule changes from initial planning
4	Economics	The occurrence of an increase in material prices
5	Natural	Weather changes
6	Project	Lack of availability of tools to carry out the job
7	Technical	Damage to the machine
		Changes due to adjustment to conditions in the field
		Scarcity and limitations of materials used
		Delays in the delivery of tools and materials
8	Human	Worker fatigue caused by the implementation of *overtime*

No.	Source of Risk	Risk Variables
9	Criminal	Loss of materials and work equipment during the course of the project
10	Salvation	Work accidents during work in the field
		Collapse during the construction of the superstructure

Severity Index

Severity Index to produce a combination of probability and impact measurements that represent all respondents' answers. The results of the calculation of frequency and impact measurements can be seen in the following table:

Table 2. Recapitulation of Frequency and Impact Measurement

It	Risk Variables	SI Values Frequency	Information	SI Values Impact	Information
A	**Politics**				
1	Government Policy	36%	Infrequently	36%	Low
B	**Milieu**				
1	Noise caused by the use of heavy equipment	78%	Often	44%	Keep
2	Air/dust pollution	69%	Often	65%	Tall
C	**Planning**				
1	Schedule changes from initial planning	69%	Often	62%	Keep
D	**Economics**				
1	The occurrence of an increase in material prices	45%	Enough	62%	Keep
E	**Nature**				
1	Weather changes	85%	Often	62%	Keep
F	**Project**				
1	Lack of availability of tools to carry out the job	51%	Enough	67%	Tall
G	**Technical**				
1	Machine damage	69%	Often	69%	Tall
2	Changes due to adjustment to conditions in the field	64%	Often	60%	Keep
3	Scarcity and limitations of materials used	38%	Enough	49%	Keep
4	Delays in the delivery of tools and materials	64%	Often	71%	Tall
H	**Human**				
1	Worker fatigue caused by the implementation of *overtime*	56%	Enough	62%	Keep
I	**Criminal**				
1	Loss of materials and work equipment during the course of the project	38%	Enough	40%	Keep

It	Risk Variables	SI Values Frequency	Information	SI Values Impact	Information
J	**Salvation**				
1	Work accidents during work in the field	38%	Enough	76%	Tall
2	Collapse during the construction of the superstructure	36%	Infrequently	78%	Tall

Probability Impact Matrix

The calculation of the risk level value is a multiplication between *Probability* (P) × Impact (I) using the probability scale value and the impact scale value. From the results of this work, later a value will be obtained that will be used as a reference for conducting a Risk Analysis.

Table 3 Recapitulation of Risk Level Value Calculation with Probability Impact Matrix

It	Risk Variables	Probability P value	Impact Grade I	Risk Level Value (P x I)	Category
A	**Politics**				
1	Government Policy	2	2	4	*Low*
B	**Milieu**				
1	Noise caused by the use of heavy equipment	4	3	12	*Medium*
2	Air/dust pollution	4	4	16	*High*
C	**Planning**				
1	Schedule changes from initial planning	4	3	12	*Medium*
D	**Economics**				
1	The occurrence of an increase in material prices	3	3	9	*Medium*
E	**Nature**				
1	Weather changes	4	3	12	*Medium*
F	**Project**				
1	Lack of availability of tools to carry out the job	3	4	12	*Medium*
G	**Technical**				
1	Machine damage	4	4	16	*High*
2	Changes due to adjustment to conditions in the field	4	3	12	*Medium*
3	Scarcity and limitations of materials used	3	3	9	*Medium*
4	Delays in the delivery of tools and materials	4	4	16	*High*
H	**Human**				
1	Worker fatigue caused by the implementation of *overtime*	3	3	9	*Medium*
I	**Criminal**				

It	Risk Variables	Probability P value	Impact Grade I	Risk Level Value (P x I)	Category
1	Loss of materials and work equipment during the course of the project	3	3	9	*Medium*
J	**Salvation**				
1	Work accidents during work in the field	3	4	12	*Medium*
2	Collapse during the construction of the superstructure	2	4	8	*Medium*

The result of the multiplication is obtained the risk value to determine the risk acceptance rate. Of the 15 risk variables, there were 3 risk factors that were unacceptable (scale > 12), 11 risk factors that were not expected (5 ≤ scale≤ 12), and 1 risk factor that was acceptable (2 < scale < 5).

Risk Response

The risks that have been obtained through the probability and Impact Matrix will then be carried out a risk response to analyze the causes, solutions and types of risk handling. The following is a recapitulation of the interview results regarding the causes of risk, risk response and risk handling

Table 4. Risk Response

Risk Variables	Cause	Risk Response	Types of Risk Handling
Noise caused by the use of heavy equipment	• Caused by the use of heavy equipment such as dump trucks, HSPD, Excavators, Vibro Rollers, Crane Cars.	• Regulate the implementation of work that will be carried out, especially at night.	Risk Reduction
Air/dust pollution	• Entering and exiting heavy equipment • The existence of soil excavation work that requires heavy equipment that has an impact on workers	• Plants are provided in the entrance and exit area • Use personal protective equipment (PPE) such as masks for workers.	Risk Reduction
Schedule changes from initial planning	• Delays in material procurement • Labor productivity is not large so that the progress of one of the jobs is not as planned	• Order materials well in advance of work and order materials to the new supplier • Rescheduling and evaluation of job descriptions that have undergone schedule changes are carried out so as not to have a major impact on the duration of the work.	*Risk Avoidance* Risk Reduction
The occurrence of an increase in material prices	• Increasing market demand	• Place an early order of materials with a subscribed distributor	*Risk Avoidance*

Risk Variables	Cause	Risk Response	Types of Risk Handling
Weather changes	• The sudden change of weather from heat to rain.	• Monitoring weather forecasts using BMKG and evaluating work that has an impact on hot and rainy weather.	*Risk Avoidance*
Lack of availability of tools to carry out the job	• Improper planning and availability of tools in the project location area.	• Ensure a detailed equipment procurement plan and the availability of equipment in the project location area is sufficient for the needs in the field or not.	*Risk Avoidance*
Machine damage	• Occurs due to the lack of regular maintenance of construction tools or machinery.	• Perform regular maintenance before and after use.	*Risk Avoidance*
Changes due to adjustment to conditions in the field	• Design changes due to requests from owners / clients	• Create a design change scheme in a short time and assess whether the cost budget will have an impact. If it has an impact, an evaluation will be carried out with the owner.	*Risk Avoidance*
Scarcity and limitations of materials used	• Increasing market demand has led to limited production capacity.	• The Contractor should before starting the project in order to know the materials that are quite difficult to obtain need special action to obtain these materials. • Planning alternative suppliers.	*Risk Avoidance*
Delays in the delivery of tools and materials	• The delivery schedule through ship expeditions is uncertain.	• Materials in the High Prosecutor's Office project that are sent from outside the city (Java) must be schematized the flow of delivery and material receipt and take into account the weather conditions at the time of delivery.	*Risk Avoidance*
Worker fatigue caused by the implementation of *overtime*	• Lack of rest time	• Implemented workforce shift system	Risk Reduction
Loss of materials and work equipment during the course of the project	• Less stringent care and supervision	• Properly manage the arrangement or placement of tools and material storage and tighten supervision by project security.	Risk Reduction

5. CONCLUSION

From this study, it can be concluded that 10 risk categories with 15 risk variables occurred in the South Kalimantan High Prosecutor's Office Development Project (Continued), the dominant category in this project is risk factors that have a medium category with 11 *undesirable* risk acceptance scales and 3 high categories with

unacceptable acceptance scales (unacceptable). Then a risk response was obtained with efforts *to Reduce Risk* for 6 risk variables, *Risk Avoidance* for 9 risk variables.

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