RISK MANAGEMENT IN CONSTRUCTION OF DRY BULK JETTY AT TELUK LAMONG MULTIPURPOSE TERMINAL

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ABSTRACT

Risk is a situation that is uncertain and there is an element of danger, the consequences that could occur due to a process that is ongoing or upcoming events. One of them in construction, where activity in this activity, there is some risk that may occur and give a great impact in the success of the completion of the work. Approaches were made to the risks involved with understanding/identification of risk, risk measurement, risk mapping, the response to risk. So with the existence of such activities can provide a recommendation as to whether the risks are acceptable, divided, reduced or avoided. This research was conducted with descriptive quantitative research methods. The results of this study concluded that there were 7 risk factors in very high level understanding of contract documents i.e., different site condition, productivity, quality equipment/material quality, smooth cash flow, the competence of sub contractors, and the influence of the weather. Against the risk of handling very high i.e. by way of doing business – business everything possible so that it can reduce the level of risk that exists so that the work can be resolved properly and the third project targets can be achieved.

Keywords : risk management, contruction project

INTRODUCTION

Along with the development of the times, the needs of a wide range of support facilities are also increasingly living activities increased. With the extent of the coverage of public services, then the role of infrastructure in support of the dynamics of a country becomes a very important meaning. The larger infrastructure projects are handled, the greater the risk a challenge anyway. (Flyvberg, 2007)

Analysis of the risk of becoming more and more important nowadays, there are many cases where the failure to manage risk properly can result in considerable losses, good for the Organization, even individuals. The potential disadvantages of risk will be even greater if people-people in the Organization have no behavior carefully. The incident could have been avoided if we understand and manage risk well (Flanagan and Norman, 1993)

At this point, the analysis and risk management at proyek-proyek had already commenced, infrastructure development although in general is still very limited to the economic aspect and funding it. A good risk management will give confidence on the

team project in carrying out project. This will avoid the management of unexpected events that jeopardize the project, as well as infrastructure development marine transportation i.e. Pier. Teluk Lamong Multipurpose Project which is currently in the construction phase, is planned to be an international port facility in Surabaya. This project has the potential to have a high risk in its construction period and many other jobs that have job risks and require prevention efforts. It is expected that with good risk management so that the process of implementing development can run smoothly and on time.

Based on the background of the problem above, the researcher wants to know the risk management of the pier construction project and to be more specific it is indicated the location of the research which is in the multipurpose port of the Lamong Bay. from the description, the researcher took the research title, namely "Risk Management In Construction Of Dry Bulk Jetty At Teluk Lamong Multipurpose Terminal". The formulation of the problem taken is based on the description of the background above as follows :

- a. what risks might arise / occur in the process of building a dock?
- b. how to measure / map the magnitude of the possible risks that arise and the impact on these risks (risk measurement)?
- c. What ways / responses should be made to the risks involved?

The purpose of this study is

- a. To identify risks in the implementation of the pier project.
- b. To analyze the magnitude of the possibility and whether the impact on risk.
- c. To analyze the response that must be made to the risks that occur outside the standard criteria carried out.

LITERATURE REVIEW

Management

Management is the process of planning, organizing, directing, and supervising the business endeavors of the members of the organization and the use of resources - other organizational resources in order to achieve the stated organizational goals (Handoko 2003: 8).

Risk

In general, risk can be interpreted as a situation faced by a person or company where there is a possibility that is harmful. What if the possibility faced can provide a very large profit while even if the loss is only very small. During the loss even if the slightest thing is considered a risk. According to Fahmi (2013: 2) risk is uncertainty about uncertainty about future events.

Risk Management

Risk management is defined as a logical and systematic method of identifying, quantifying, determining attitudes, defining solutions, and monitoring and reporting risks that take place in every activity or process. According to Pramana (2011), risk is a

result that is less pleasant or dangerous than an act or action. In other words, risk is the possibility of a situation or situation that can threaten the achievement of the goals and objectives of an organization or individual.

Dock

According to Triatmodjo (1996) the pier is a port building that is used to dock ships and anchor them during loading and unloading of goods. The pier is where the ship is moored at the port. At the pier various activities for loading and unloading goods and people from and on board are carried out. At the pier, activities are also carried out to refuel vessels, drinking water, clean water, channels for dirty water / waste which will be processed further at the port.

RESEARCH METHODOLOGY

This research was conducted with quantitative descriptive research methods. The purpose of this research is to describe a number of variables relating to the problem and the unit under study between the phenomena being tested. In this study the technique used to collect research data, namely with a questionnaire as an instrument to answer a set of questions or written statements to respondents. There are two types of data that will be obtained from this data collection activity, namely primary data and secondary data.

Research Procedure

DATA PROCESSING

Risk Planning

Project success is measured through four project objectives, namely Cost, Time, Scope, and Quality. The risk impact on the project can be categorized as low, medium or high, depending on how the risk affects the project. This study uses a quantitative method, so that risk assessment based on primary and secondary data comes from data from interviews, questionnaires and direct observations in the field regarding the risks that occur in the project sourced from AS / NZS 4360: 2004. After the data collection is complete, then the data that has been obtained, both the assessment questionnaire data and the interview data are processed through data processing stages. Risk is formulated as a function of likelihood and negative impacts.

$$\text{Average possibility} = \frac{\sum_1^n \text{possibility}}{\text{number of respondents } (n)}$$

$$\text{Average impact} = \frac{\sum_1^n \text{impact}}{\text{number of responden (n)}}$$
$$\text{Risk} = \frac{\sum_1^n \text{possibility} \times \text{impact}}{\text{number of responden (n)}}$$

Risk identification

This risk identification activity is a method of giving questionnaire forms to 30 respondents where in this activity the respondents were the construction actors of the Project Manager, Site Manager, executor of PT Hutama Karya (Persero) as the executing contractor. Respondents filled out questionnaire forms by selecting one of the possible levels or levels of impact that were appropriate or not for each of the variables. After the data collection is complete, then the data that has been obtained, both the assessment questionnaire data and the interview data are processed through data processing stages. Risk is formulated as a function of likelihood and negative impacts. From the results of the survey questionnaires, data processing was performed using the % index method of each variable, namely

$$\text{Index formula \%} = \text{total score} : \text{highest number} \times 100\%$$

Table 1 Questionnaire Processing

NO	RISK FACTORS	CODE	PROCENTAGE (%)	
			FREQUENCY	IMPACT
A	Management Factors			
1	Understanding of contract documents	R1	93	90
2	Job approval	R2	27	57
3	Weekly / routine meetings	R3	33	37
4	K3 Management	R4	40	49
B	Planning Factor			
1	Different site condition	R5	89	90
2	Additional Item	R6	40	51
3	Design error	R7	31	61
4	Permit	R8	47	43
C	Equipment Factor			
1	Equipment availability	R9	32	40
2	Mobilization of equipment	R10	42	43
3	Productivity of Equipment	R11	83	83
D	Material Factor			
1	Material Availability	R12	56	41
2	Material mobilization	R13	29	49
3	Material quality	R14	83	87
E	Financial Factors			

1	Cash Flow	R15	79	81
2	Payment of terms	R16	57	49
F	Factors of Human Resources			
1	Willingness of the worker	R17	41	29
2	Worker Ability	R18	51	36
3	Sub Contractor Competence	R19	87	81
G	Natural and Community Factors			
1	Weather	R20	89	82
2	Safety on site	R21	33	49
3	Geological and topographic conditions	R22	29	33
4	Community socialization	R23	26	31

Table 2 Likert Scale

Possible x Impact						
Level of Risk Impact	Very Large	5	5	10	15	20
	Large	4	4	8	12	16
	appreciable	3	3	6	9	12
	Small	2	2	4	6	8
	Very Small	1	1	2	3	4
			1	2	3	4
			Very rarely	Rarely	enough	often
			Level of Possibility Risks			

After processing data based on the Likert scale table the results are obtained as in the following graph.

Fig. 1 Research Result

Plan Risk Response

Some ways of responding to the risks that occur are avoiding risk, transferring risk, reducing risk, and accepting risk. The strategy design process is carried out to compile mitigation actions in handling potential risks. Mitigation action assessment is carried out based on the level of difficulty in carrying out each of the mitigation actions. As is the case with the impact assessment of mitigation and risk probability.

The level of risk is very high, there are 7 risk factors that need to be responded to in the following ways:

- Errors in understanding contract documents, the mitigation process is to review the rights and obligations of each party in the contract by involving other parties / independents.
- Different site condition, mitigation process that is carried out research / land investigation / measurement in advance together between the owner and the executor before starting the job / when aanwijzing field.
- Equipment Productivity, the mitigation process is carried out to optimize the use of tools in accordance with their capacity.
- Material quality, mitigation process that is carried out to test material quality before being used at the work location.

- e. Cash Flow during work, mitigation process that is carried out cash flow management / priority scale of project budget usage.
- f. Sub Contractor competency, mitigation process, namely selection of experienced and competent sub-contractors.
- g. Effect of weather, mitigation process that is coordinating with relevant parties (BMKG) regarding weather conditions.

There are 13 risk factors that are in a sufficient level and 3 risk factors that are at a low level. For the level of sufficient risk and low risk is acceptable / acceptance and no mitigation action is needed to reduce the level of risk that exists.

Comparison of Research Results with Existing Conditions

- a. Risk analysis at a very high level, one of which is a different site condition with contract documents. In practice, one example of an activity found is the difference in pile depth from the plan with realization in the field. The existence of these differences affect the cost of procurement of material and equipment rental costs. So as to suppress / reduce the risk analysis by conducting a land survey / investigation first.
- b. Risk analysis at a sufficient level, one of which is K3 management. The real conditions at the location of work for the implementation of OHS are quite good when viewed from the possibilities and impacts that exist. One of them is carried out routinely safety briefings every day before starting the work with the intention of reminding and checking the completeness of K3 both from personal protective equipment and the readiness of transportation equipment used.
- c. Risk analysis at a low level, one of them is a weekly meeting. Weekly meetings are held regularly every week to evaluate the progress of work implementation during the previous week and to plan any activities to achieve the targets that have been determined by involving supervisors, contractors and project owners.

CONCLUSION

From the results of the analysis and previous discussion, conclusions can be taken as follows:

- a. There are 7 risk factors that are at a very high level, namely understanding contract documents, different site conditions, equipment productivity, material quality, cash flow, sub-contractor competence, and weather effects;
- b. The method of measurement carried out is using a quantitative descriptive method by distributing questionnaires to 30 respondents to obtain interpretation values of the impact and the level of possibility that arises from the existing risks;
- c. Handling of high risk is done by reducing risk, namely the mitigation process by making efforts as much as possible so as to reduce the level of risk that exists so

that the work can be resolved properly and the three project objectives can be achieved;

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