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Research Paper

Analysis the Risk That Affects the Time Performance Fitting Out Project in the Jakarta Office of Pt. Donggi Senoro Lng

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ABSTRACT: *The fitting out office construction project at Pondok Indah Office Tower 5 Floor 17 certainly cannot be separated from risks that can cause project failure. If this risk is not examined and addressed, it will have an impact on the disruption of overall project performance so that it can cause losses to costs, time, and quality of work. The results of the literature study and analysis obtained 11 risk categories and 50 risk variables in the Jakarta office fitting out project of PT. DSLNG. From the calculation results, the biggest risk level in this project is the physical condition of the field with a weight of 14 (24.56%), then government policy risk with a weight of 16 (28.07%), contract risk with a weight of 12 (21.05%), material risk with weight 9 (15.79%), and risk of natural events with weight 6 (10.53%). Control of dominant risks needs to be carried out properly so that these risks can be controlled properly and so that they do not affect time performance which can hinder work activities in the field. After handling the risks in the high risk and extreme categories, these risks can be controlled and accepted by the contractor so that the project implementation can run smoothly according to plan, namely on time, on budget and with quality and the contractor does not get fines due to delays and can get profits according to company expectations.*

KEYWORDS: *Risk Analysis, Jakarta, Project Time Performance.*

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I. INTRODUCTION

Donggi Senoro is the first LNG project in Indonesia which was developed based on RI Law no. 22 of 2001 concerning "Downstream Business Activities". Factory Location PT. Donggi Senoro LNG is located in Uso Village, Batui District, Banggai Regency, about 610 km from Palu City, the capital of Central Sulawesi Province and the Jakarta office of PT. Donggi Senoro LNG is located at Sentra Senayan II, 13th Floor. After almost 12 years having an office at Sentra Senayan II, 13th Floor, the board of directors of PT. Donggi Senoro LNG plans to relocate the old office to the new office.

A fitting out project is a construction project that includes additions or changes or renovations from the initial conditions carried out by occupants or tenants through a licensing process and building owner approval. Jakarta office fitting out project PT. Donggi Senoro LNG consists of floor, ceiling, partition, mechanical, electrical and furniture screeding work. This office fitting out project is a design and build project contract so that the contractor is asked to make detailed drawings based on the approved concept drawings at the time of the contract appointment.

The office fitting out project is certainly not free from various kinds of risks that can cause project failure. Careful planning in good project management activities and the accuracy of risk management implementation needs to be done by the contractor so that the fitting out project can be completed on time, within budget and with quality. Risks during the construction of fitting out offices at Pondok Indah Office Tower 5 Lt.17 are Technical and Non-Technical risks, where Technical risks are Materials, tools, labor, field production, interior design, and others. Non-technical risks include natural weather, finance, permits, the surrounding environment, material delivery, traffic jams around the project, and several events that usually occur at the project site.

The risk may also be avoided or the risk will be reduced or transferred from one party to another. So that if this risk is not examined and responded to, it will have an impact on disrupting the overall project performance so that it can cause losses to costs, time, and quality of work.

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II. RESEARCH LOCATION

This research was conducted at PT. DSLNG which is currently located at Jl. Asia Africa No. 8 lt. 13, Sentral Senayan II, Central Jakarta and will change the office address to Pondok Indah Office Tower 5 lt.17, Wisma Pondok Indah Complex, Jl. Sultan Iskandar Muda No.29 Pondok Pinang, Kebayoran Lama, South Jakarta. Figure 1 is research location and figure 2 is distance from old office to new office.

Figure 1

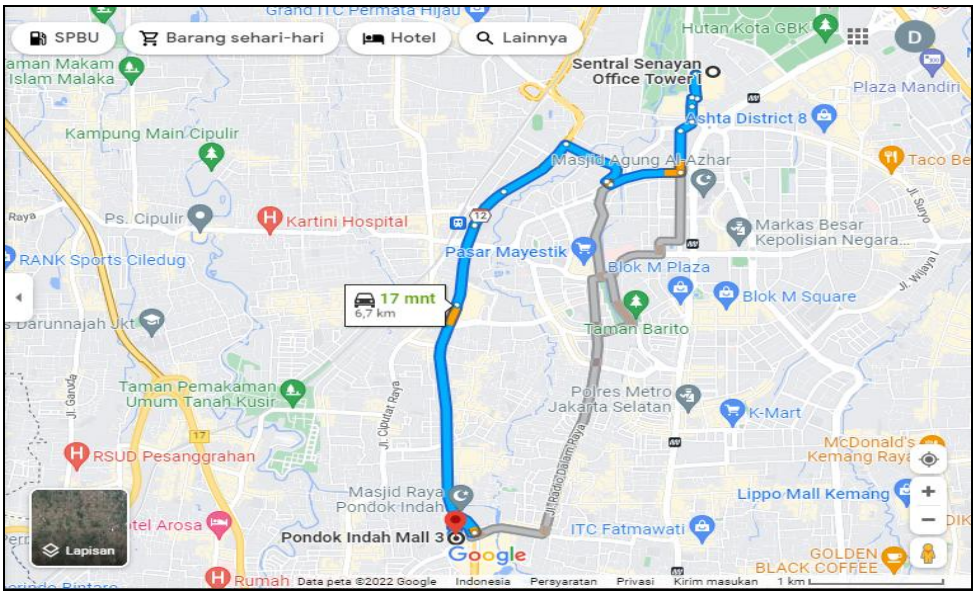

Figure 2

III. DETERMINATION OF RISK VARIABLES

Risk identification is a process of assessing risk and uncertainty that is carried out systematically and continuously. In order for risks to be managed effectively, the first step is to identify the types of business risks and which are pure risks. Project risk is classified as pure risk, then identified again based on the source of risk or it can also be based on the impact on project objectives [1]. The following is a list of respondents namely Owners, Consultants, Contractors as shown in Table 1.

No	Name	Position	Information
1	Dadi Daruslan	Project Manager	Owners (PT. DSLNG)
2	Darmawan	Project Engineer	
3	Valentino Sopacua	Project Director	Consultants (PT. Cushman & Wakefield)
4	I Made Kelana	Project Manager	
5	M. Naufal	Interior Designer	
6	Bernadetha	Cost Manager	
7	Chandra Budiman K	Coordinator PM	Contractors (PT. Karya Mentari Seraya)
8	Parlindungan Sagala	Project Manager	
9	Rubi Agustiawan	Interior Designer	
10	Helmi Faisal	Supervisor	
11	Cantik Cahaya M	Safety Officer	
12	Lisa Nurhayati	Safety Officer	

Table 1

IV. RESULTS OF RESEARCH AND DISCUSSION

Respondents were asked to provide ratings on 11 risk categories and 50 risk variables. Validation of relevant risk variables that affect time performance in the Jakarta office fitting out project PT. Donggi Senoro LNG is carried out by asking 12 respondents to fill out a questionnaire by checking (√) in the column provided with the following information:

- (Yes) Risk : Variable risks that have occurred in the project.
- (No) Not Risk : Variable risks that never occur in the project.

The results of the assessment of the risk variable "Yes" or "No" that occurred in this project can be seen in Table 2.

No	Risk Variable	Code	Risk	
			Yes	No
1	Natural events			
	a. Weather conditions (Rain)	R1	11	1
	b. Natural disasters (Earthquakes, Floods)	R2	1	11
	c. Fire	R3	0	12
2	Social Conditions			
	a. Riot/riot	R4	0	12
	b. Strike	R5	0	12
3	Government policy			
	a. Changes in government policy regarding the Covid-19 protocol	R6	12	0
	b. Vehicle odd-even policy	R7	1	11
4	Material			
	a. Increase in material prices	R8	12	0
	b. Delay in delivery of materials	R9	12	0
	c. Materials theft	R10	5	7

No	Risk Variable	Code	Risk	
			Yes	No
	d. Material quality	R11	5	7
	e. Damage during delivery	R12	1	11
	f. Damage during storage	R13	5	7
	g. Incorrect time of order	R14	4	8
	h. Material purchasing error	R15	2	10
	i. Changes in material specifications	R16	3	9
	j. Changes in the type and type of material	R17	4	8
	k. Scarcity of materials	R18	12	0
	l. Material volume estimation error	R19	12	0
	m. Material approval process by the owner	R20	1	11
5	Equipment			
	a. Improper equipment	R21	0	12
	b. Equipment delivery delays	R22	0	12
	c. Equipment mismatch	R23	0	12
	d. Equipment quality	R24	0	12
	e. Equipment productivity	R25	0	12
6	Financial			
	a. Down payment from the owner	R26	0	12
	b. Payment of invoices from the owner	R27	0	12
	c. Payments to subcontractors that are not on time	R28	1	11
	d. Cost estimation inaccuracy	R29	1	11
	e. Bank loan interest	R30	1	11
	f. Cash flow bottlenecks	R31	1	11
	g. Deposit payment to landlod	R32	1	11
7	Construction Method			
	a. Improper construction methods (finishing interior work, etc.)	R33	5	7
	b. Application of new/special technology	R34	0	12
	c. Incorrect implementation procedure	R35	3	9
8	Labor			
	a. Shortage of labor	R36	4	8
	b. Labor capability	R37	2	10
	c. Workforce competence	R38	1	11
	d. Subcontractors are not experts in their field	R39	1	11
	e. Employee bad behavior, culture & habits	R40	8	4
9	Contractor Management			
	a. Lack of experience of managers, supervisors and project teams	R41	0	12

No	Risk Variable	Code	Risk	
			Yes	No
	b. Lack of supervision in the field	R42	0	12
	c. Lack of communication and coordination between parties	R43	2	10
	d. Lack of support from management for the needs of the location	R44	2	10
10	Contract			
	a. Site Instruction, Contract change order (CCO), or (changes in a construction project which include, replacement, reduction, addition or removal of work after the contract is signed)	R45	12	0
	b. Incomplete design	R46	8	4
11	Physical conditions on the ground			
	a. Permit to landlord (PIOT5 building owner)	R47	8	4
	b. Approval drawing from landlord (PIOT5 building owner)	R48	12	0
	c. Queuing conditions in the service elevator to the 17th floor PIOT5.	R49	12	0
	d. Queuing condition of parking area loading dock B1 PIOT5	R50	12	0

Table 2

4.1 STATISTIC TEST

After getting the results of the assessment of the risk variables "Yes" and "No" that occurred in this project, then statistical test using Cochran's Q method. The data that has been obtained by questionnaire I is then arranged in a table for recapitulation calculation.

$$Q = \frac{(k-1)\left[\sum_j^k C_j^2 - (\sum_j^k C_j)^2\right]}{k\sum_i^n R_i - \left(\sum_i^n R_i^2\right)}$$

If Qcount > Qtable, then Ho is rejected so it is necessary to do further testing by eliminating it risk variables in the questionnaire that have the least proportion of risky answers until Qcount <Qtable is found.

In test 4, Ho is accepted because Qtable > Qcount, so this risk variable is considered valid and affects time performance in the Jakarta office fitting out project of PT. Donggi Senoro LNG in Figure 3.

R	Responden											
	1	2	3	4	5	6	7	8	9	10	11	12
R1	0	1	1	1	1	1	1	1	1	1	1	1
R6	1	1	1	1	1	1	1	1	1	1	1	1
R8	1	1	1	1	1	1	1	1	1	1	1	1
R9	1	1	1	1	1	1	1	1	1	1	1	1
R18	1	1	1	1	1	1	1	1	1	1	1	1
R19	1	1	1	1	1	1	1	1	1	1	1	1
R45	1	1	1	1	1	1	1	1	1	1	1	1
R48	1	1	1	1	1	1	1	1	1	1	1	1
R49	1	1	1	1	1	1	1	1	1	1	1	1
R50	1	1	1	1	1	1	1	1	1	1	1	1

Cj	Cj^2
11	121
12	144
12	144
12	144
12	144
12	144
12	144
12	144
12	144
12	144
12	144
119	1417

9	10	10	10	10	10	10	10	10	10	10	10	=	119	Li
81	100	100	100	100	100	100	100	100	100	100	100	=	1181	Li^2

Figure 3

4.2 CALCULATION OF PROBABILITY AND IMPACT VALUES

Respondents were asked to rate the probability and impact of project risks. This variable data is then recapitulated and processed using the Severity Index (SI) method. Then a combination of frequency and risk impact assessments that affect time performance was carried out in the Jakarta office fitting out project of PT. Donggi Senoro LNG.

$$SI = \frac{(\sum_{i=0}^{4} a_i x_i}{4 \sum_{i=0}^{4} x_i} (100\%)$$

As an example for assessing the frequency of the variable R1, namely weather conditions.
a1 = 4 (For Very Rare answers)
a2 = 3 (For Rare answers)
a3 = 2 (For the answer Sometimes)
a4 = 1 (For frequent answers)
a5 = 0 (For Very Frequent answers)

$$SI = \frac{[(0x0)+(1x5)+(2x4)+(3x3)+(4x0)]}{4\ x\ 12} \text{ x } 100$$

SI = 45,83

A recap of the project likelihood/probability risk (Likelihood) questionnaire results can be seen in table 3 and a recap of the results of the project risk severity/impact value questionnaire can be seen in table 4.

Code	Risk Variable	Poin					SI	Scale
		1	2	3	4	5		
R1	Weather conditions (Rain)	0	5	4	3	0	45.83	3
R6	Changes in government policy regarding the Covid-19 protocol	0	1	4	7	0	62.50	4
R8	Increase in material prices	0	0	12	0	0	50.00	3
R9	Delay in delivery of materials	3	8	0	1	0	22.92	2
R18	Scarcity of materials	3	6	3	0	0	25.00	2
R19	Material volume estimation error	0	0	12	0	0	50.00	3
R45	Site Instruction, Contract change order (CCO), or (changes in a construction project which include, replacement, reduction, addition or removal of work after the contract is signed)	1	3	5	3	0	45.83	3
R48	Approval drawing from landlord (PIOT5 building owner)	0	6	6	0	0	37.50	2
R49	Queuing conditions in the service elevator to the 17th floor PIOT5.	0	0	2	7	3	77.08	4
R50	Queuing condition of parking area loading dock B1 PIOT5	0	0	0	6	6	87.50	5

Table 3

Code	Risk Variable	Penilaian					SI	Scale
		1	2	3	4	5		
R1	Weather conditions (Rain)	3	7	2	0	0	22.92	2
R6	Changes in government policy regarding the Covid-19 protocol	0	2	3	7	0	60.42	4
R8	Increase in material prices	0	0	12	0	0	50.00	3
R9	Delay in delivery of materials	0	0	5	7	0	64.58	4
R18	Scarcity of materials	0	0	1	7	4	81.25	5
R19	Material volume estimation error	0	5	5	2	0	43.75	3
R45	Site Instruction, Contract change order (CCO), or (changes in a construction project which include, replacement, reduction, addition or removal of work after the contract is signed)	0	1	3	4	4	72.92	4
R48	Approval drawing from landlord (PIOT5 building	0	1	7	4	0	56.25	3

Code	Risk Variable	Penilaian					SI	Scale
		1	2	3	4	5		
	owner)							
R49	Queuing conditions in the service elevator to the 17th floor PIOT5.	0	0	6	6	0		
R50	Queuing condition of parking area loading dock B1 PIOT5	0	0	6	6	0		

Table 4

4.3 CALCULATION OF RISK VALUE AND RISK RATING

The Likelihood value is formulated as a probability and the consequence value is formulated as an impact. Furthermore, the average value of the probability and impact of each risk is multiplied to get a risk value according to the formula below which will then be followed by sorting the risks from the highest value to the lowest value to obtain a risk rating [2].

Risk assessment is basically calculating or evaluating the impact of identified risks, and classifying the size of the impact of these risks. The size of the impact of the risk can be categorized, where the major level of risk (major risk has a large and broad impact that requires management, and low level risk (minor risk) does not require special treatment because the risk impact is within acceptable limits. Table 5 is Risk Value and table 6 is Risk percentage weight.

Code	Risk Variable	Probability	Impact	Risk Value	Rating
R1	Weather conditions (Rain)	3	2	6	10
R6	Changes in government policy regarding the Covid-19 protocol	4	4	16	3
R8	Increase in material prices	3	3	9	7
R9	Delay in delivery of materials	2	4	8	8
R18	Scarcity of materials	2	5	10	5
R19	Material volume estimation error	3	3	9	6
R45	Site Instruction, Contract change order (CCO), or (changes in a construction project which include, replacement, reduction, addition or removal of work after the contract is signed)	3	4	12	4
R48	Approval drawing from landlord (PIOT5 building owner)	2	3	6	9
R49	Queuing conditions in the service elevator to the 17th floor PIOT5.	4	4	16	2
R50	Queuing condition of parking area loading dock B1 PIOT5	5	4	20	1

Table 5

No	Risk Variable	Risk Value	Weight	Persentage
1	Natural events		6	10.53%
	a. Weather conditions (Rain)	6		
3	Government policy		16	28.07%
	a. Changes in government policy regarding the Covid-19 protocol	16		
4	Material		9	15.79%
	a. Increase in material prices	9		
	b. Delay in delivery of materials	8		
	c. Scarcity of materials	10		
	d. Material volume estimation error	9		
10	Contract		12	21.05%
	a. Site Instruction, Contract change order (CCO), or (changes in a construction project which include, replacement, reduction, addition or removal of work after the contract is signed)	12		

11	Physical conditions on the ground		14	24.56%
	a. Approval drawing from landlord (PIOT5 building owner)	6		
	b. Queuing conditions in the service elevator to the 17th floor PIOT5.	16		
	c. Queuing condition of parking area loading dock B1 PIOT5	20		

Table 6

V. CONCLUTION

Based on the analysis and discussion that has been done, it can be concluded that:

1. The results of the literature study and at the identification stage obtained 11 risk categories and 50 risk variables in the Jakarta office fitting out project of PT. DSLNG. After validating with Cochran's Q statistical calculations, the results obtained are in the form of variables that are as many as 10 valid and relevant variables that can affect the performance of the Jakarta office fitting out project time of PT. Donggi Senoro LNG.
2. The results of the calculation of the level of risk and likelihood refer to the AS/NZS 4360:1999 matrix, it is found that the biggest risk level in this project is the physical condition of the field, namely with a weight of 14 (24.56%), then government policy risk with a weight of 16 (28.07%), risk contracts with a weight of 12 (21.05%), material risk with a weight of 9 (15.79%), risk of natural events with a weight of 6 (10.53%).

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