

Contract Development Strategy in Reducing the Risk with House of Risk Method in Pt. KLO (Case Study Oil&Gas Company In Indonesia)

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Abstract

Contract development of procurement process at Oil Company as PT. KLO should follows many regulations of contract development. At the other side, there are some near misses/failure contracts because of unable to anticipate the risk earlier. There is no research to categorize the risk order and strategy to mitigate the risk. This research aim is to identify risk events, identify risk agents, and mitigation strategy of contract development process with House of Risk (HOR) method. The core of supply chain process to make contract already analyzed to identify the risk potential and effect resulted. Risk agents and related probabilities also already analyzed. Aggregate of risk potential was defined for each risk agents to know the damage level. This method was applied at department of contract & buying of PT. KLO Company, one biggest operator of oil and gas exploration in Indonesia through cooperation with Oil and Gas institution of Indonesia Republic (SKK Migas). The research findings identify thirty four (34) risk agents and twelve (12) the main mitigation actions that significantly effective to reduce the contract making risks in PT. KLO

Keywords: contract making, risk cause, House of Risk, regulation of goods procurement

I. INTRODUCTION

KLO Corporation is one world's largest energy companies to engage every aspect of energy industry, especially oil and gas, including exploration, production, refining, marketing and power generation. Supply Chain Management Division KLO Corporation of Contract and Buying Department (C & B), especially in Contract group, has one of main issues today relates to procurement process of goods and services. This needs a solution to prevent the occurrence of risky contract. The C & B department of Contract Group deals contracts for company operations needs, especially for strategic and long-term objective by establishing and creating the service contracts as well as long-term umbrella contracts price agreements of a commodity. The flow chart diagram of contracting process is shown in Figure 1 below.

Procedures for procurement and contracting process should be carried out in accordance with guidelines of SKKMIGAS (Special Unit for Upstream Oil and Gas Business Executors) on Working Guidelines for Supply Chain Management, often known as PTK 007 or Working Procedure No. PTK-007/SKKO0000/2015/S0 - Decree of SKK Migas Head Number KEP-0018/SKKO0000/2015/S0 Year 2015, other related government regulations, and PT. KLO Policy-500, etc. The practice has procedural errors risk and time-consuming. Regardless of procurement value, it must still be carried out by following similar 49 stages of process sequence, complete with proof of process documents with approval from procurement members, procurement chairman, and authorized officials in company.

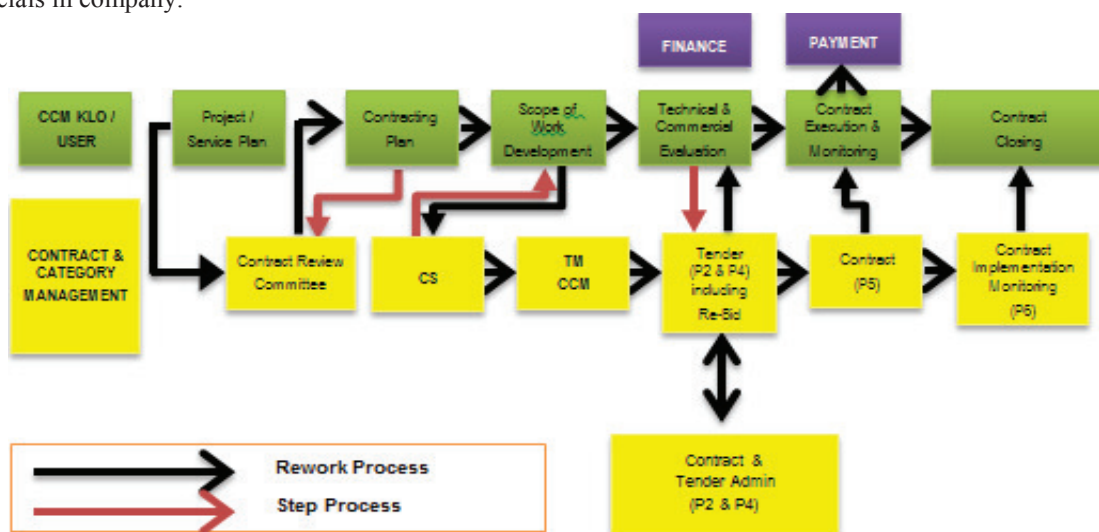


Figure 1. Contract flow diagram in PT. KLO

The various regulations for contract-making procedure must be complied, but there are still some incidents/near miss contracts due to failure to anticipate risks earlier. This requires tools to remind Contract Advisor professionals to recognize the risks. The proactive focus on risk prevention on contract making becomes the task of SCM Contract and Buying Division to reduce the incidence of contracts making risk.

There are many risks from contract incidents and poor contract quality (Evan and Lindsay, 2002; Fuller, 2010). This includes the disruption of company's business, as shutting down, project implementation delay, other resources/activities idle because the expected services or goods are not ready, higher inventory costs, potential revenue loss due to priority changes due to delay in services and goods, financial losses from extra repair costs, loss of opportunity to produce more, close-out project delays, reducing the performance reporting value of KPI (key performance indicators) between companies and governments (SKKMIGAS), potential to loss operational cost refunds from cost recovery, incompliance, leakage of corporate money, and may even trigger legal risks in criminal matters, for example, if proven to cause significant state losses.

The purpose of this study is to identify, analyze and select the risk sequence and risk mitigation strategies in contracting process. The method used is House of Risk (HOR) developed by Pujawan and Geraldin (2009). This method is based on idea that a proactive supply chain management should seek to focus on preventive measures (Fiorini et al., 2017; Stindt, 2017; Amrani et al., 2012), such as reducing the probability of risk agent occurrence (Perez et al., 2017; Plambec, 2012;). Reducing the occurrence of a risk agent will usually reduce some risk events. This requires identification of risk events related to risk agents (Lechman, 2015; Nilakantan et al., 2015; Perry, 1990; Xie et al. 2015; Yano, 1987).

This paper proposes to perform the risk analysis on contracting in SCM Procurement & Contract Department. The analysis includes identifying mitigation strategies to handle contractual risks in upstream oil and gas industry in a sustainable manner to explore all the potential causes of risk issues from all aspects of business processes involved. With possibility of poor implementation of mitigation strategy, an alternative contingency plan is needed so that risk can be reduced or even eliminated altogether (Raut et al., 2017; Ahmad et al., 2016; Lima et al., 2016; Krupta, 2013).

II. LITERATURE REVIEW

1. Risk

The risk term has been commonly heard and understood the meaning. Chopra and Sodhi (2004) define risks as the chaos/distraction/delay of raw materials, information, and cash flow in supply chains to lower sales or increase costs. Risk is a variation occurred over a certain period. Risk is the probability of an outcome that is different than expectation (Li et al., 2015; Ualison et al., 2017; Rao et al., 2017; Garalo et al., 2013; Thun and Heonig, 2011)).

General definition of risk is still much different, but the classical concept is most often understood to reflect the variations in distributions toward possible outcomes and subjective values of those possibilities (March and Shapira, 1987). Risks in supply chains center on flow disruption within organization. These streams are related to information, materials, products and costs. They are not independent each other but are clearly interconnected (Awudu, and Zhang, 2012).

It can be concluded that risk can always associates with possibility of unexpected/undesirable adverse events. It is uncertainty or the possibility of something happening that will lead to losses.

2. House of Risk Method (HOR)

The House of Risk (HOR) is a proactive risk management method to focuses on preventive measures, where the Risk Agents are identified as the risk cause event that can be managed with an effective proactive step to reduce the likelihood of occurring, so that risk events can be reduced or prevented. Proactive steps are carried out in accordance with order of impact magnitude caused (Pujawan and Geraldin, 2009).

Pujawan and Geraldin (2009) developed this risk management model based on idea that preventing risk agents simultaneously can prevent one or more risk events by modifying the model of Failure Mode and Effects Analysis (FMEA) for risk quantification, adjusting the HOQ model to prioritize the Risk agents. The idea used to develop a framework to manage risk is known as House of Risk (HOR) approach. This HOR approach focuses on preventive measures to reduce the probability of risk agents to become trigger factor and a driver of risk. In other words, reducing the risk agent means reducing the incidence of some risk events.

This HOR method approach is divided into two phases called HOR1 and HOR2. HOR1 is used to determine or identify the risk agents for priority prevention, whereas HOR2 is a priority for effective handling solution in accordance with existing budgets and resources.

3. House of Risk (HOR) Steps

Identifying the sequence of risk agents using HOR1 can be done in following steps:

1. Identifying Risk events occurred in every business process.
2. Identifying the magnitude of impact severity if the Risk event occurred. Scale from 1 to 10 is used to assess the impact, where 10 illustrate extremely severe or catastrophic effects. This severity is depicted with Si.
3. Identifying Risk agents and assess the occurrence probability of each Risk agent. It uses a scale from 1 to 10,

where 1 means almost never happens and 10 are almost certain. Risk agent is described as A_j , while the probability of occurrence is symbolized by O_j .

4. Determining the correlation matrix between each risk agent and incidence of each risk, using the scale of 0, 1, 3, 9, where 0 represents no correlation, 1 denotes low correlation, 3 denote mean, and 9 denote height correlation. The symbol of this correlation is R_{ij} .
5. Calculating the Aggregate Risk Potential of agent j (ARP_j) value. This ARP value is determined by possibility of risk occurrence for agent j and severity impact generated by risk events caused by risk agent j and correlation between the risk agent and risk event. The results of ARP value calculation will be used to determine the priority of risk agents to be given prevention to reduce or prevent the occurrence of risk events. The calculation formula as below:

$$ARP_j = O_j \sum_i S_i R_{ij} \dots \dots \dots (1)$$

6. Ranking the risk agents according to ARP values, starting with largest value to lowest value. This phase determines the future action to be performed in accordance with difficulty level as well as the available resources, but effectively reduces the possibility of risk agent incident. The steps of HOR2 are as follows:

1. Selecting some highest-priority rank of risk agents generated from the calculation of ARP values with HOR1 steps above. Pareto analysis is used to select the risk agent.
2. Identifying the deemed effective and relevant prevention to risk agent. A risk agent can be handled by more than one precaution and one precaution can simultaneously reduce the probability of more than one risk agency. This precaution is caused with PAK.
3. Determining the relationship between each prevention and each risk agent with 0, 1, 3, 9. Scale 0 means none, scale 1 means low, scale 3 means medium, while scale 9 means high relationship between the action K and agent j . This relationship is assumed as E_{jk} and can be considered as the effectiveness of action k in reducing the likelihood of agent risk.
4. Calculating the effectiveness total value of each action. This value may state how the action taken actually addresses the probabilities of risk agent. The formula of total effectiveness is follows:

$$TE_k = \sum_j ARP_j E_{jk} \quad \forall k \dots \dots \dots (2)$$

5. Assessing the difficulty level to implement each action. The difficulty level of these prevention should be able to accommodate and reflect the budget and other resources needed to perform such preventive measures. Difficulty level is symbolized by DK .
6. Calculating the total effectiveness of difficulty ratio (ETD $_k$) with following formula:

$$ETD_k = TE_k / D_k \dots \dots \dots (3)$$

7. Giving priority ranking for each precaution (R_k). Priority for each precaution is stated in accordance with value of efficacy of stability level ratio (ETD $_k$), order 1 is given prevention measure with highest total effectiveness value from highest difficulty level. The highest prevention describes the most cost-effective prevention.

III. RESEARCH METHODOLOGY

1. Process Flow Research

Flowchart is a diagram to explain steps taken to solve the a study problem. The stages in this study are illustrated in figure 2 below.

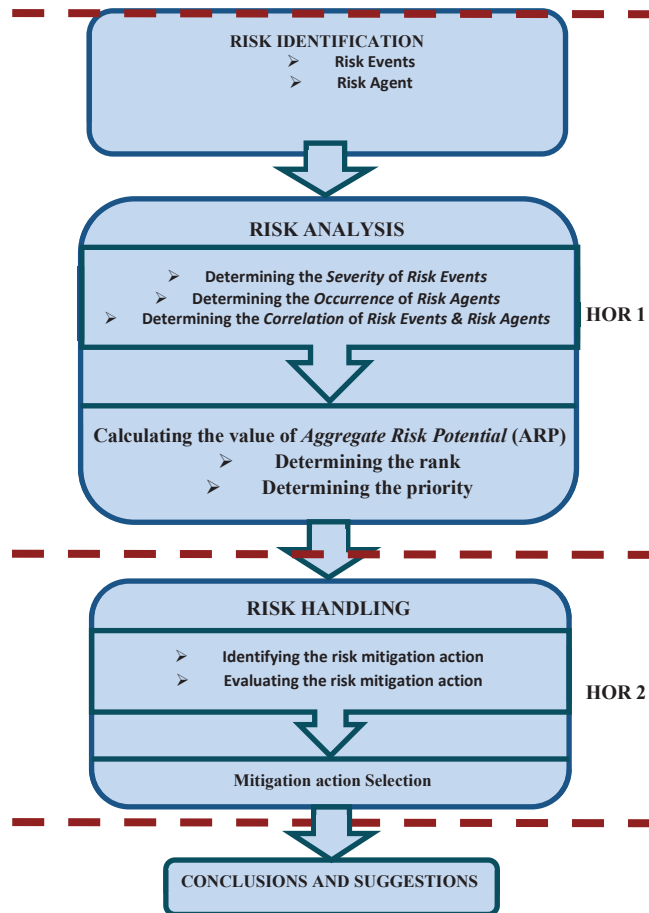


Figure 2. Flowchart of Research Methodology

The figure 2 contains the stages of the research. It can be explained below.

- Risk Identification Stage .
 This stage aim is to identify the risks within contracting in form of a list of risk events identification and risk agents.
- Risk Analysis Stage

The next stage is data processing, including risk analysis to determine the severity level (consequence) of Risk Events. This value indicates the disturbance level caused by an asset risk event and company's reputation. In addition, it also analyzes the occurrence probability of risk agents and probability of a risk agent becomes the trigger of within House of Risk 1 (HOR 1) model.

Risk events and risk agents are assessed for correlation, as an analysis material to calculate the value of Aggregate Risk Priority (ARP). This ARP value is determined by occurrence rate and severity and correlation between the risk agent and risk event. The formula to calculate ARP values is as follows:

$$ARP_j = O_j \sum_i S_i R_{ij} \dots \dots \dots (4)$$

Where :

- ARPj: Aggregate Risk Priority from j risk agents
- Oj: Occurrence from a j risk agent
- Si: Consequence or severity impact if the i risk event occurred
- Rij: Correlation between j risk agents and i risk events

The results are ranked by 80:20 principle of Pareto chart to generate the selected risk agent as a reference to prepare risk management plan, as shown in table 1 below.

Table 1. HOR 1 Model

Risk Event (Ei)	A1	A2	A3	A4	A5	A6	A7	Severity of Risk event i (Si)
E1	R11	R12	R13					S1
E2	R21	R22						S2
E3	R31							S3
E4	R41							S4
E5								S5
E6								S6
E7								S7
E8								S8
E9								S9
Occurrence of agent j	O1	O2	O3	O4	O5	O6	O7	
Aggregate Risk Potential j	ARP1	ARP2	ARP3	ARP4	ARP5	ARP6	ARP7	
Priority rank of agent j								

Source: Pujawan, et al., 2009

• **Risk Management.**

Mapping the mitigation action data in House of Risk 2 model (HOR 2) is done after conducting a follow-up survey by distributing second stage questionnaire. It contains the list of selected risk agents according to results of ARP value analysis in previous stage (HOR 1) and Mitigation action to reduce the emergence of risk agents. The scale used is shown by table 2.

This stage identify the most effective mitigation action to reduce the probability of risk agent through mapping with House of Risk 2 model (HOR 2), as shown by Table 3. This phase calculates the total effectiveness value for each mitigation (TE_k), difficulty level to perform mitigation action (D_k) and total effectiveness of difficulty level of mitigation action (ETD_k). The calculation of TE_k and ETD_k values is follows:

$$TE_k = \sum_j ARP_j E_{jk} \quad \forall k \dots \dots \dots (5)$$

Where :

TE_k: Total effectiveness for each k mitigation action

ARP_j: Aggregate Risk Priority from j risk agents

E_{jk}: Correlation between each mitigation action with each risk agent.

The calculation of difficulty level of mitigation action (ETD_k) is follows:

$$ETD_k = TE_k / D_k \dots \dots \dots (6)$$

Where :

ETD_k: Difficulty level ratio of k mitigation action

TE_k: Total effectiveness of each k mitigation action

D_k: Difficulty level of each k mitigation action

Table 2. Scale Action Mitigation Difficulty Level

Scale	Level	Description
5	Very difficult	Factors affecting the difficulty level, include: human resources, bureaucracy, procedures, commodities and specks material, time, and others
4	Difficult	
3	Rather Difficult	
2	Easy	
1	Very Easy	

Table 3. HOR 2 Model

To be treated risk agent (Aj)	Preventive Action (PAj)					Aggregate risk potentials (ARPj)
	PA1	PA2	PA3	PA4	PA5	
A1						ARP1
A2						ARP2
A3						ARP3
A4						ARP4
Total effectiveness of action k	TE1	TE2	TE3	TE4	TE5	
Degree of difficulty performing action k	D1	D2	D3	D4	D5	
Effectiveness to difficulty ratio	ETD1	ETD2	ETD3	ETD4	ETD5	
Rank of priority	R1	R2	R3	R4	R5	

Source: Pujawan, et al., 2009

- Risk and cost analysis
 The value of difficulty level of mitigation action is ranked in accordance with order of difficulty level ratio value. Rank one is the mitigation action with highest difficulty ratio level followed by the value below.
- Recommendation of mitigation actions
 This stage determines the conclusion to provide effective and efficient preventive recommendations to risk agents in accordance with calculations order on HOR 2 model.

2. Research Objects

This study object is the contracting process at Department of Contract and Buying Division SCM of PT. KLO. The occurrence of risk incidents in contracting process has a significant impact on PT. KLO losses. Strategic prevention and anticipation are required to minimize the risk events in contract (Jeeva and Baswaid, 2014).

3. Data Collection

About 10 practitioners were selected to get more representative data. They are selected from several experts in PT. KLO with 7 years experience or more and contributing in contract making. The experts selected come from Contract Advisors, Contract Users/Owner, End User, Compliance Section, Tender Admin, Legal Officer and Contract Management SCM.

Besides the primary data from the discussion of focus group (expert judgment), secondary data will also be taken from the historical record of contract creation in PT. KLO as a material consideration when determining the consequence and occurrence of risk events and risk agents, as well as to determine the costs required to combat cause of these risks. This data also show rework process, and description of problems encountered when the contract is made, and other related data that may be required for analysis purposes.

IV. RESULTS AND DISCUSSION

The review of this research focuses on departments under the Managing Contracting and Buying Manager, especially the Contracting section at PT. KLO. Detail risk analysis with HOR method can be explained below.

Risk Analysis with HOR 1

The contracting process always has risks potential and need to be identified to establish a prevention program to reduce the incidents/near misses on contracting. House of Risk 1 methodology need input by identifying the potential risks below to prioritize the prevention action.

Risk Identification Process

Risk is an event that causes losses during the event is still ongoing. A risk can create one or more risk impacts that would disrupt a business process. Risks are also caused by a various factors and opposite risk cause can result in various risks. Causes of risk can become a trigger factor of a risk incident.

The risk identification stage involves identification of Risk Events and Risk Agents. The identified risk events are standardized in according to SCM Department, as shown in Table 4 below.

Table 4. Risk Event

No	Risk Event	Code
1	Delay in contract making process/cancellation of auction process	E1
2	Incompliance	E2
3	Productivity loss	E3
4	Lawsuits	E4
5	Penalty/fine to PT. KLO	E5
6	Cost recovery loss from Government	E6

Source: Dept. SCM Chevron 2016

Identifying the Causes of Risk

Identification process will identify the risk events and cause. A tool can be developed to more easily identify the risk cause to remind contracting professionals to know the causes of risk and learning how to control/mitigate those risks (Çerekçi and Banerjee, 2015). It is arranged in 10 parts of process/contract activity, where each process/activity has potential risk events. This concept is exactly the same risk-causing circle identification for HSE (Health, Safety, and Environment) field, as shown in Figures 3 and Figure 4.



Figure 3. Identification circle of risk cause for HSE field (Dept. HSE Chevron, 2012)

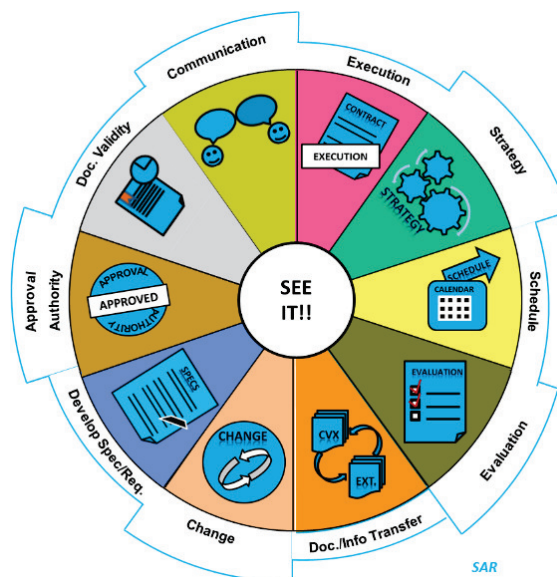


Figure 4. Identification circle of risk cause in contract making (Dept. SCM Chevron, 2016)

Risk Assessment

The purpose of a risk assessment is to determine the probability level of risk event. Risk event assessment is determined by 3 factors, namely the severity level, probability level of risk cause, and correlation value between the risk events and risk cause. Another important calculation is the Aggregate Risk Potential (ARP). It is the priority level of risk cause determination.

The occurred risk will be assessed with severity level. It indicates how much risk event can disrupt business processes. Therefore, process to determine severity level is important as basis of risk assessment and prioritizes the risk cause level.

The severity value is obtained through interviews with Team Manager of Contract Category and Contracting Team Leader as well as focus group discussions with contract advisors and contract owners. The scale 1 – 10 is used to determine the impact of risk events.

The survey results at PT. KLO are shown in table 5.

Table 5. Severity Level Scale of Risk contract making event at PT. KLO

No	Risk Event	Code	Severity
1	Delay in contract making process/cancellation of tender process	E1	7
2	Incompliance	E2	7
3	Productivity loss	E3	8
4	Lawsuits	E4	8
5	Penalty/fine to PT. KLO	E5	10
6	Cost recovery loss from Government	E6	9

Correlation Identification

This stage will identify the correlation relationship between risk events and risk cause. This correlation value is obtained from interviews with Contract Manager Team Category, Contracting Team Leader and with focus group discussion with contract advisors as well as based on secondary data. The scale 0 means no relationship, scale 1 means weak relationship, scale 3 means medium relationship and scale 9 means high relationship. The correlation value is obtained from the focus group discussion for correlation between Risk Events with Risk Causes in contract making at PT. KLO.

Calculation of Aggregate Risk Potential (ARP)

Aggregate Risk Potential (ARP) is used to rank the risk events occurred. ARP value is obtained by multiplying the severity value by occurrence value. Higher value of ranking shows the most important of risk event management. The value becomes the basic benchmark to select the risk causes to be prioritized in mitigation actions.

The formula to determine the amount of ARP of an agent is obtained by using the following formulation:

$$ARP_j = O_j \sum_i (S_i R_{ij})$$

Where :

O_j = Occurrence Probability of a risk agent

S_i = Impact Severity if the i risk event occurred

R_{ij} = Correlation between j risk agent and I risk event

It also can be interpreted as how much the possibility of j risk agent can cause i risk event.

The calculation and amount of ARP value can be seen in Table Exhibit 1 for HOR-1.

Calculation of Risk Agents Prioritization

The selection of Risk Agent to determine the prevention action is done by prioritization mechanism through Pareto analysis on ARP calculation result. Pareto analysis is a statistical technique in decision making to select a number of tasks that produce a significant overall effect. The Pareto Principle (known as the 80/20 rule) explains the risks causes fall into high category to contribute 80% to total ARP value. The highest risk causes will get first handling and mitigation strategy planning. Principle 80:20 means the 80% risk cause is responsible for 20% risk events. Pareto diagram for taking 6 causes of risk with highest ARP value can be seen in Figure 5 below.

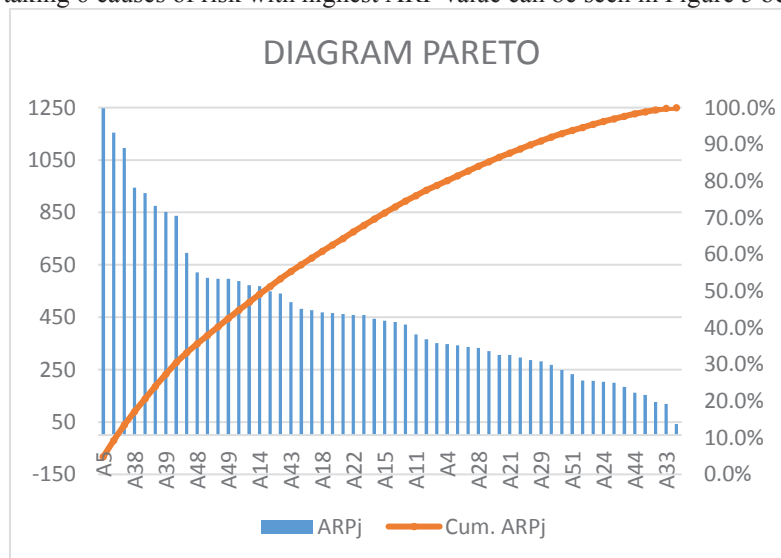


Figure 5. Pareto Diagram of ARP rank value in HOR 1

Based on identification of selected Risk Agent prevention and expert assessment on difficulty level in carrying out these prevention and correlation of selected Risk Agent by prevention measure, company must identify and prioritize the proactive actions to maximize and streamline the resources and existing funds. Based

on above equation, it can be calculated the total value of effectiveness and difficulty ratio, as shown in Table Exhibit 2 on House of Risk-2.

Expert assessment the correlation between the selected 34 Risk Agent with prevention measure and difficulty level to perform the action, it can be determined the order of preventive action based on ETD (Effectiveness to Difficulty Ratio) in HOR 2, as shown in figure 5 below.

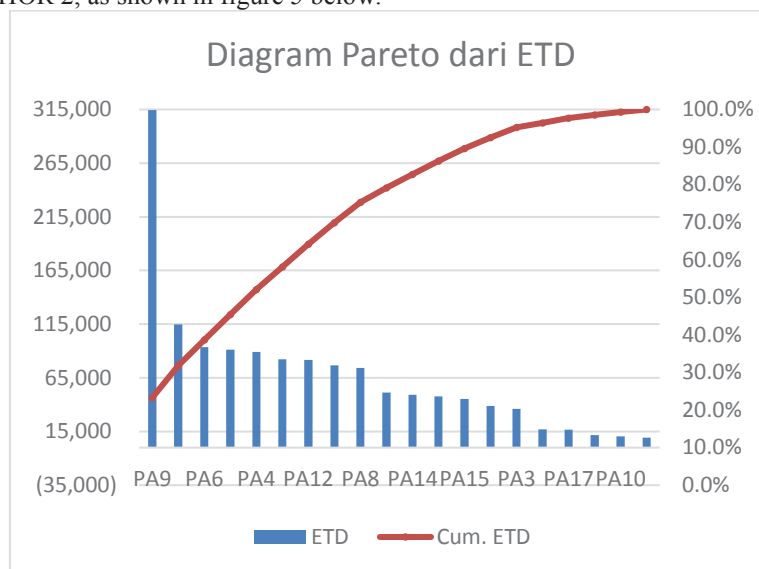


Figure 5. Pareto Diagram of ETD

Based on above tables and Pareto analysis, there are 12 preventive measures considered to have significant effectiveness and should be undertaken to reduce the risk that may occur in according to difficulty factor of each preventive action. The explanation of prevention and correlation with Risk Agent are follows:

1. Continuous socialization, periodically share the incident/near miss experience on contract making in regular meetings.
2. Implementing more simple SOPs (Business process procedure) and consistent with provisions of PTK 007 only (Government regulation only).
3. Contract Owner/User prepares the scope of work on contract clearly, high quality, without multi-interpretation.
4. Contract Advisor closely coordinates with contract owner.
5. Company should standardize the format of tender process forms and avoids revisions to change the format of tender form template, including frequent changes to contract template format.
6. SKK Migas (Government body) immediately implements the revised regulation of PTK 007 that simpler, less stringent, and has eliminated multi-interpretation rules.
7. The Company issued Service Level Agreement (SLA) to contract advisor and procurement committee to increase the employee performance in procurement process.
8. Promoting the implementation of software programs to accelerate the work of contract advisors with automation software programs to reduce the potential risk of human errors.
9. Promoting risk awareness campaigns in contract making through risk identification tools to contract advisors and contract owners.
10. Promoting the implementation of BPP/SOP to each contract advisor and Procurement Committee.
11. Re-fresher training to tender committee, including in this case re-certification of PTK 007 certificate.
12. Contract Advisor/Buyer must be more thorough and discipline in arranging the contract.

V. CONCLUSIONS AND SUGGESTIONS

1. Conclusions

This research was conducted at PT KLO, oil & gas company in Jakarta, where the risk cause, risk occurrence and preventive action or mitigation strategy is carried out by House of Risk method. The research object is in Division of Contracting and Buying of SCM Department with responsible for developing contracts for company.

Based on results of analysis and discussion, it can be concluded below:

a. House of Risk method can produce following parameters:

- There are 6 risk events.
- There are 56 initial risk agents.
- Value of Aggregate Risk Potential (ARP) for early correlation of risk event and risk cause was produced

by Pareto Analysis. There are 34 main causes of risk agent that need to be considered by company.

- Prevention measures or mitigation strategies obtained are 20 preventions.
- Correlation of 34 main risk agents and 20 precautions produce total effectiveness ratio to difficulty level and after done Pareto Analysis there are 12 recommendation of prevention action/main mitigation strategy.

b. House of Risk method is proven as right solution to design a risk mitigation strategy. The most important risk cause should be addressed, there are 34 risk causes and 12 major mitigation prevention/mitigation measures to minimize the cause of those risks.

2. Suggestion

Research on HOR methods relates to how to formulate a management strategy of contract making risk has shown good results for prioritization and chooses major mitigation measures. Some suggestions can be given to company and future researcher.

- a. House of Risk model can be used as an alternative risk management in an activity process of Department SCM of a company.
- b. It should involve the right people in accordance with their expertise to obtain identification of risk events, risk agents, and precise and accurate prevention.
- c. PT. KLO can create a team and start to implement the Risk Management in SCM Department.

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EXHIBIT

Table Exhibit 1. House of Risk-1

TABLE HOR 1		RISK AGENTS (Aj)																						
		(E _i)	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂	A ₁₃	A ₁₄	A ₁₅	A ₁₆	A ₁₇	A ₁₈	A ₁₉	A ₂₀	A ₂₁	A ₂₂
Delay in contract making process/cancellation of auction process	E ₁	9	3	3	9	9	9	0	0	1	0	0	3	3	9	3	9	3	0	3	3	3	3	3
Incompliance	E ₂	9	9	9	0	3	3	9	9	9	9	9	9	3	9	9	3	9	9	9	9	9	9	9
Productivity loss	E ₃	1	1	0	3	9	3	0	0	0	0	0	1	1	1	1	1	1	9	1	1	1	1	1
Lawsuits	E ₄	0	1	0	0	0	0	9	3	1	3	3	3	3	1	1	3	0	1	3	3	3	3	3
Penalty/fine to PT. KLO	E ₅	0	0	0	0	0	0	1	1	9	0	0	1	0	0	0	0	3	1	0	1	1	1	1
Cost recovery loss from Government	E ₆	0	0	3	0	0	0	1	3	0	3	1	1	0	0	1	3	0	9	3	3	3	3	3
OCCURRENCE OF AGENT	O_j	2	2	4	4	8	4	3	2	2	3	4	4	4	4	4	4	3	2	2	2	2	3	1
AGGREGATE RISK POTENTIALS	ARP	268	200	444	348	1248	432	462	248	336	342	384	540	296	568	436	572	366	468	286	306	306	459	153
RANK OF PRIORITY	R	44	50	27	34	1	29	24	45	36	35	31	18	41	16	28	15	32	22	42	39	40	25	53

Continue Tabel Exhibit 1. House of Risk-1

RISK AGENTS (Aj)																							Severity of Risk Event												
A ₂₄	A ₂₅	A ₂₆	A ₂₇	A ₂₈	A ₂₉	A ₃₀	A ₃₁	A ₃₂	A ₃₃	A ₃₄	A ₃₅	A ₃₆	A ₃₇	A ₃₈	A ₃₉	A ₄₀	A ₄₁	A ₄₂	A ₄₃	A ₄₄	A ₄₅	A ₄₆	A ₄₇	A ₄₈	A ₄₉	A ₅₀	A ₅₁	A ₅₂	A ₅₃	A ₅₄	A ₅₅	A ₅₆	(S _i)		
9	3	3	9	3	1	9	3	9	3	9	0	0	9	9	9	1	3	9	9	0	1	9	9	9	9	1	9	9	0	9	1	1	7	S ₁	
1	9	9	9	9	9	3	9	9	9	3	3	3	0	0	9	9	9	1	1	9	9	3	9	9	3	9	9	9	9	3	9	9	7	S ₂	
3	1	1	3	0	0	1	1	1	1	1	1	0	3	9	1	1	3	9	3	0	0	3	3	0	3	1	1	3	1	9	1	1	8	S ₃	
9	3	1	9	0	3	3	1	9	0	0	1	0	0	0	1	3	9	1	3	1	9	3	3	0	9	9	1	3	1	0	9	9	8	S ₄	
1	1	0	3	0	0	1	0	0	0	9	0	0	0	0	0	3	9	0	0	1	3	0	1	0	1	1	1	0	1	0	1	3	10	S ₅	
3	3	3	3	3	0	1	3	3	3	0	9	0	0	0	0	3	9	0	1	9	3	0	3	9	1	0	9	1	1	1	1	9	3	9	S ₆
1	3	1	3	3	3	7	8	2	1	2	1	2	8	7	6	3	1	4	4	1	3	7	2	3	3	2	1	3	6	7	2	1			
203	459	127	837	333	282	875	1096	466	119	184	208	42	696	945	852	477	351	600	508	162	597	924	422	621	597	320	233	549	588	1155	482	207			
49	26	54	8	37	43	6	3	23	55	51	47	56	9	4	7	21	33	11	19	52	12	5	30	10	13	38	46	17	14	2	20	48			

Description

- A_j RISK AGENT
- E_i RISK EVENT
- O_j OCCURRENCE OF AGENT
- ARP_j AGGREGATE RISK POTENTIALS _j
- R RANK OF PRIORITY
- A1: Bid Plan proposal is returned by SKK Migas (Government) because of Non PSC scope is entered in package
- A2: The selected tender method does not conform to CP (Contracting Plan) approved by Management
- A3: The selected award basis is not suitable with provisions and lack of justification that approved by management.
- A4: OE (Owner Estimate) and/or budget are too low, resulting in tender failure.
- A5: The contract must be amended because it does not anticipate the need in field when CP is made.
- A6: Error in determining field/sub field causing failure of tender/unqualified supplier.
- A7: Approving nonstandard equipment without contract amendment.
- A8: Do not apply penalties in according to contract contents.
- A9: A contract or contract amendment requires FCPA Clearance, but no FCPA Clearance is made After the Fact (ATF) when the contract is signed.
- A10: PB (Performance Bond) from contractors does not have enough value and period of times.
- A11: PB and/or insurance certificates from contractors are issued by suspended company companies.
- A12: Inconsistencies and contradictions between (one) term, definition, value or contract duration between amendments used vs. original contract.
- A13: Inconsistent or difference between contract language in English and Indonesian versions.
- A14: Error typing and/or inclusion of PT. KLO entity by bidders.
- A15: There is a difference in inclusion of contract period between the F-135 cover documents, and/or body of contract, and/or CPs, and/or Justification, and/or confirmation letters, and/or BAR (Bid Award Recommendation) documents.
- A16: Bid Guarantee (Bid Bond) from one bidder does not use the latest bid bond format/required by auction document
- A17: Conflict interest and any improper influence on articles contained in contract.
- A18: The original contract has expired and contract amendment is delayed so payment is made with risk memo.
- A19: Winner of Appointment Letter is issued after the contract effective
- A20: The number of days for tender registration period is shorter than in PTK book
- A21: Announcement of time periods for documents filing after the PQ (Prequalification) announcement, period determination to take tender document into schedule of explanatory meeting or determination period of retention period is made less than that specified by PTK 007.
- A22: Bidder does not give sufficient time to respond to clarification.
- A23: One bidder does not give a lot of time to respond than other resulting in protests and lawsuits (unfair competition)
- A24: Giving contract to second lowest bidder, for miscalculating the bid price evaluation
- A25: There is non-compliance with PTK007 and applicable laws and regulations in contracting process.
- A26: SQ (Supplier Qualification) process is not done.
- A27: Protest because it is considered unfair competition, because PT. KLO on one occasion disqualify, while in another tender qualify.
- A28: The SQ evaluation was not completed in relation to incomplete follow-up document
- A29: The protests from the tender participants are invalid, but protesting bidders are not given red sanctions (incompliance).
- A30: Document of technical evaluation method is not clear on how the method of evaluation.
- A31: The contract is already run while the PB (Performance Bond) is not yet received.
- A32: One or more tender participants did not receive the final revision of tender document.
- A33: The job-handover process between PT. KLO employees is not smooth, resulting in opening of price covers but OE (Owner estimate) has not been approved by authorized officials.
- A34: Bid Plan is returned by SKK Migas due to incomplete (Not complete the technical discussion document with technical section of SKK Migas).
- A35: PT. KLO pays the unit at higher price than listed in contract due to incorrect data entry into ariba catalog.
- A36: Does not submit a contract copy for a contract above USD 5 million to SKK Migas.
- A37: The technical document of contract made is less clear, resulting in many revisions in explanatory meeting and added processing time.
- A38: Bidders do not understand management of tender process, and do not understand how to prepare technical and commercial documents, so the bidding fails.

- A39: Changes in technical evaluation requirements are communicated verbally during pre bid meeting. Not listed in pre bid document.
- A40: Disputes with contractors for neglecting to include update of legal/commercial terms.
- A41: Contracts amendment is not consistent with provisions of PTK 007, PJWK more than 1 year and contract value amendment more than 10%.
- A42: Recent changes to regulations on procurement of goods and services (PTK 007).
- A43: Unclear work scope/unclear evaluation method.
- A44: Writing the reward price on contract, including Tax Income
- A45: Tendering requirements and technical specifications lead to specific vendors
- A46: Preparation of tender documents is unclear and multi-interpretation, making long clarification time and tender process
- A47: Preparation of tender requirements and technical specifications are not consistent with approval of SKK Migas/Not consistent with basic principles of Supply Chain management
- A48: Tender requirements and technical specifications on goods/equipment, do not use the reference in APDN (local content) books.
- A49: Disputes with contractor due to miss reference, wrong copy paste, typo error, and inconsistency.
- A50: The contracting official and cover contract do not have POA/DOA level for part/entirely PT. KLO legacy entered in contract
- A51: Package of tender more than USD 5 MM is processed without getting approval of SKK Migas (Government).
- A52: Failure to extend the offer validity and offer warranty before the procurement process complete.
- A53: Does not monitor PB and Insurance expiration while the contract is alive.
- A54: The contract expires without on time new replacement, due to poor monitoring
- A55: Providing work orders verbally/informally to contractor before the contract in signature.
- A56: Notify internal processes to suppliers/bidders.

Table Exhibit 2. House of Risk-2

TABLE HOR 2	PREVENTIVE ACTION (PA _n)																				AGGREGATE RISK POTENTIALS	
	(A ₁)	PA1	PA2	PA3	PA4	PA5	PA6	PA7	PA8	PA9	PA10	PA11	PA12	PA13	PA14	PA15	PA16	PA17	PA18	PA19		PA20
RISK AGENTS																						
The contract must be amended because it does not anticipate the need in field when CP is made.	A5	0	1	0	1	1	3	3	1	3	0	3	0	0	0	0	0	9	9	3	0	1248
The contract expires without on time replacement, due to poor monitoring/long auction process, so amendments to existing contracts or bridging contracts must be made.	A54	9	9	3	3	1	3	3	9	3	0	9	3	0	3	0	0	9	9	9	0	1155
The contract is already on run when PB is not yet received.	A31	9	3	0	1	3	3	3	1	9	0	1	3	1	3	9	0	0	0	3	0	1096
Bidders do not understand the management of auction process, and do not understand how to prepare technical and commercial documents, so the bidding fails.	A38	9	9	0	3	0	9	0	1	3	3	1	1	0	0	9	9	0	0	9	9	945
Preparation of tender documents is unclear and multi-interpretation, making long clarification time and tender process.	A46	3	3	9	9	3	9	9	3	9	1	9	3	1	3	1	0	3	0	3	0	924
Document of technical evaluation method is not clear on how the evaluation method.	A30	1	3	9	9	3	9	9	9	9	0	9	3	3	3	1	0	0	0	9	0	875
Changes in technical evaluation requirements are communicated verbally during pre bid meeting. Not listed in prebid document.	A39	9	3	9	9	3	9	3	9	9	0	9	3	3	3	3	0	0	0	9	0	852
Protest because it is considered as unfair competition, because PT KLO disqualifies at one time, while not on other bidding opportunities.	A27	9	9	3	9	3	3	3	3	9	0	1	3	3	3	3	1	0	0	3	0	837
The technical document of contract is less clear, resulting many revisions in explanatory meeting and added processing time.	A37	3	3	9	9	3	9	3	3	3	1	9	3	3	9	3	0	3	0	3	0	696
Tender requirements and technical specifications on goods/equipment, do not use the reference in APDN books.	A48	9	9	3	3	3	9	3	3	9	9	3	3	3	9	3	0	1	1	3	3	621
Recent changes to regulations on procurement of goods and services (PTK 007).	A42	9	3	0	9	1	1	3	3	9	3	0	3	0	3	9	1	1	0	9	0	600
Tendering requirements and technical specifications lead to specific vendors.	A45	3	3	3	9	3	9	3	3	3	3	9	3	3	3	3	9	0	0	3	3	597
Disputes with contractor due to miss reference, wrong copy paste, typo error, and inconsistency.	A49	9	9	9	9	3	9	0	3	9	0	3	3	9	3	3	1	0	0	9	0	597
No PB monitoring and insurance expired while the contract is alive.	A53	9	3	0	1	3	1	0	3	9	0	0	3	3	3	3	1	0	0	9	0	588
Bid Security from one bidder does not use the latest bid bond format required by auction document.	A16	9	9	0	9	3	0	0	0	9	0	0	3	3	0	9	3	0	0	9	0	572
Typing error and/or entity inclusion of PT. KLO by bidders.	A14	9	9	0	9	1	0	0	0	9	0	0	3	3	3	9	3	0	0	9	0	568
Failure to extend the offer validity and offer warranty before the procurement process is complete.	A52	9	9	0	3	1	0	0	0	9	0	0	9	9	9	9	3	0	0	9	0	549
Inconsistencies and contradictions between (one) of term, definition, value or contract duration between used in amendments vs. original contract.	A12	1	3	3	9	1	9	3	3	9	0	9	3	9	1	3	0	0	0	9	0	540
Unclear work scope/unclear evaluation method.	A43	3	3	9	9	3	9	9	9	9	1	9	3	1	1	3	0	0	0	3	0	508
Providing work orders verbally informally to contractor before the contract in signature.	A55	3	3	0	3	3	9	9	3	3	1	1	3	0	1	3	1	0	0	1	0	482
Disputes with contractors for neglecting to include up date legal/commercial terms.	A40	3	3	3	9	3	9	3	1	9	0	3	9	3	3	3	0	0	0	3	0	477
The original contract has expired and amendment contract is delayed so payment is made with risk memo.	A18	3	3	0	3	3	9	3	3	9	1	9	3	0	3	0	0	9	9	3	0	468
Some auction participants did not receive the final revision of auction document.	A32	3	9	0	9	3	9	1	3	9	0	9	9	9	3	1	0	0	0	9	1	466
Approving nonstandard equipment without contract amendment.	A7	3	3	1	3	3	9	3	3	9	0	9	3	1	3	1	0	0	0	1	0	462
Does not give sufficient time to bidders to respond to clarification.	A22	9	3	0	3	3	3	0	3	3	0	0	3	3	3	3	0	0	0	3	0	459
There is non-compliance with PTK007 and applicable laws and regulations in contracting process.	A25	9	9	3	9	3	9	1	3	9	0	0	9	3	9	3	0	0	0	3	0	459
The selected award base is not suitable with provisions and lack of justification that approved by management.	A3	9	9	1	9	3	9	3	3	3	1	9	9	1	3	0	0	1	0	3	0	444
There is a difference in inclusion of contract period between the F-135 documents, and/or contracting bodies, and/or CPs, and/or Justification, and/or confirmation letters, and/or BAR documents.	A15	3	3	0	9	3	9	1	3	9	0	1	3	9	9	0	0	1	0	9	0	436
Error in determining field/sub field creating failure of tender/qualified supplier.	A6	9	9	1	9	3	9	0	3	9	0	0	1	9	3	0	3	0	0	9	9	432
Preparation of tender requirements and technical specifications are inconsistent with approval of SKK Migas/Not consistent with basic principles of Supply Chain management	A47	9	9	3	9	3	9	3	9	9	1	3	3	9	3	0	0	0	0	9	0	422
PB and/or insurance certificates provided by contractors is issued by suspended companies.	A11	1	3	0	1	0	1	0	1	9	0	0	3	9	0	3	3	0	0	3	0	384
Conflict of interest and any improper influence on articles contained in contract.	A17	1	3	0	3	1	9	3	3	9	0	9	3	1	3	3	3	0	0	1	0	366
Contracts amendment is inconsistent with provisions of PTK 007, PJWK more than 1 year and contract value amendment more than 10%.	A41	9	9	3	9	3	9	3	3	3	0	0	9	1	9	3	0	0	0	3	0	351
OE and/or budget are too low, resulting tender failure.	A4	9	3	3	3	3	9	3	9	9	0	9	3	0	1	3	0	3	0	1	0	348
Total Effectiveness of Action k	TE _k	246633	229632	108576	267072	102336	280800	116064	148512	314496	31200	182208	163488	143520	147264	136032	51168	49920	34944	229632	31200	
Degree of Difficulty Performing Action k	D _k	3	2	3	3	2	3	3	2	1	3	2	2	3	3	3	3	3	3	3	3	
Effectiveness to Difficulty Ratio of Action k	ETD _k	82.211	114.816	36.192	89.024	51.168	93.600	38.688	74.256	314.496	10.400	91.104	81.744	47.840	49.088	45.344	17.056	16.640	11.648	76.544	10.400	
Rank of Proactive k	R _k	6	2	15	5	10	3	14	9	1	19	4	7	12	11	13	16	17	18	8	20	

Description

Aj RISK AGENT

PAi RISK CAUSE

TEk TOTAL EFFECTIVINESS OF ACTION K

Dk DEGREE OF DIFFICULTY PERFORMING ACTION K

ETDk EFFECTIVENESS TO DIFFICULTY RATIO OF ACTION K

Rk RANK OF PROACTIVE K

ARPi AGGREGATE RISK POTENTIAL

- PA1: SKK Migas (Government) immediately implements the revision of simpler, less strict requirements of PTK 007 regulation, and has eliminated multi-interpretive regulations.
- PA2: Applying more simple SOP (Business process procedure) and consistent with provisions of PTK 007 only, not set more heavily than that stipulated in provisions of applicable PTK 007, including elimination of document requirements and routing the documents approval that are too over kill.
- PA3: The company standardizes the SOW (scope of work) for contract requests that always repeated/routine for contract owner/user.
- PA4: The Company standardizes the format of auction process forms and avoids revisions as much as possible to change the format of auction form template, including avoiding the frequent changes to contract template format.
- PA5: Promoting the implementation of BPP and SOP to each contract advisor and Procurement Committee.
- PA6: The Contract Owner/User in preparing the scope of work on contract should clear, qualified, not multi-interpretation, including clarity of specification, fines clause, owner estimate the appropriate market conditions and provide equality for new bidders and not violate government regulations.
- PA7: Holding workshops and education contract to owners/users so PA6 prevention can be quickly realized, they understand process, including education on how to manage ongoing contracts.
- PA8: Promoting risk awareness campaigns in contract creation through risk identification tools in contracts to contract advisors and contract owners.
- PA9: Continuously socialize and sharing the incident/near miss experiences of contract in regular meetings.
- PA10: Management and auction committee aware to Government's program to empower domestic production and always use the reference guidance on APDN book/web site.
- PA11: Contract Advisor coordinates better with contract owner.
- PA12: The company issues Service Level Agreement to contract advisors and Procurement Committees to request performance of its employees.
- PA13: Contract Advisor/Buyer must be more thorough and disciplined in arranging the contract. Taking time to check & re-check to avoid human errors.
- PA14: Re-fresher training to Procurement Committee, including in this case re-certification of PTK 007 certificate
- PA15: Socialization and guidance of tender process procedures to contractors/suppliers in vendors day forums to improve understanding of vendors when following auction/tender.
- PA16: Inviting potential vendors and contractors to register and update the new CIVD data base vendor of SKK Migas.
- PA17: Business Planning Companies are improved and communicated to implementers.
- PA18: Creating a mitigation plan for each process of procurement requests for services and goods, especially for contracts with big value and strategic importance.
- PA19: Promoting the implementation of software programs to accelerate the work of contract advisors with automation software programs to reduce the potential risks of human error, including document approval routines, PQ (Praqualification) process automation, bidding processes, digital bidding in order to reduce human error in Auction participants and also made software program for reminder system to procurement committee if there will be potential deviation from tender process.
- PA20: Accelerating the completion of data base vendors List of Qualified Providers of PT. KLO, for optimal use of contract advisor.