DISCRETE VS INTEGRATED PROJECT MANAGEMENT (IPM) AND INTEGRATED DRILLING SERVICE (IDS) CONTRACT FOR GEOTHERMAL DRILLING IN INDONESIA

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ABSTRACT

Drilling for geothermal activity in Indonesia has been growing in recent years. Many energy companies have entered the geothermal industry in Indonesia. These newly established companies usually have limited geothermal knowledge on their team. Most of them use Integrated Project Management (IPM) and Integrated Drilling Service (IDS) contract types to develop their geothermal area starting from the drilling campaign to their power plant purchasing and installation. Unlike geothermal practices, the oil and gas industry in Indonesia is more mature and settled, where most of operators are using a discrete type of contract for drilling.

The purpose of this study is to compare between the discrete contract type and IPM/IDS contract type. Various aspects like company strategy, resources quantity and quality, logistic and location of the project and many other things will give us insight into what is the most suitable drilling contract type between IPM/IDS or discrete for geothermal companies in Indonesia. This application of contracts is analyzed based on the technical and economic aspects to give a summary of what factors need to be considered before applying one type of contract.

This paper is expected to give a thorough summary of the advantages and disadvantages of discrete and IPM/IDS contract types for geothermal drilling campaigns. What type of contract is most suitable for geothermal operators based on the resources they have and the kind of project that they want to develop? Further studies with more sources are still required to fully prove the feasibility of the concept.

1. INTRODUCTION

1.1 Geothermal Drilling Contract

By definition, Williams, Schaffner, & Co (1989) stated that a contract is a deliberate engagement between competent parties with a lawful consideration or cause to do or not to do a particular thing; and the obligation of a contract is found in the terms in which the contract is expressed. They also mentioned that the key words of any contract are the same, which are: promise, agreement, obligation, performance, and consideration.

Geothermal drilling projects require around 15-25 services depend on the drilling program and contingency plan. That complexity has triggered geothermal companies to develop the most appropriate drilling contract type.

Several reasons why a company needs to have an appropriate drilling contract are (de Wardt & van Gils, 1994; Isa, Hartono, Jayanto, & Putra, 2017):

1. To produce and maintain cost-effective quality wells
2. To achieve the highest safety standards in the process of well construction
3. To comply with local government regulation and with company policy

In Indonesia's drilling industry, both petroleum and geothermal, there has not yet been a standard for drilling contract type or name. In this paper we try to define for each type of contract the differences and comparison of the important project aspects.

1.2 Objectives and Methodology

The purposes of this paper are as follows:

1. Give an overview of geothermal drilling contracts in Indonesia;
2. Give an overview of oil and gas type contracts and their application to the geothermal industry;
3. Extract lessons learned from using a discrete type of contract and IPM/IDS
4. Discuss what is the more suitable type of contract based on company condition.

The study compiles various information and experiences regarding geothermal contracts worldwide from previous publications and research. A comparison between several type of drilling contract from recent geothermal drilling in Indonesia will give perspective on the current trend and how to choose the most suitable contract for geothermal drilling in Indonesia.

This study is admittedly still in the early phase. The authors welcome any feedback or question that might be useful to improve the quality of the information presented on this paper.

2. GEOTHERMAL DRILLING CONTRACT

In general, geothermal drilling contracts have a similar approach to oil and gas drilling on how to develop the contract after the drilling engineering is completed.

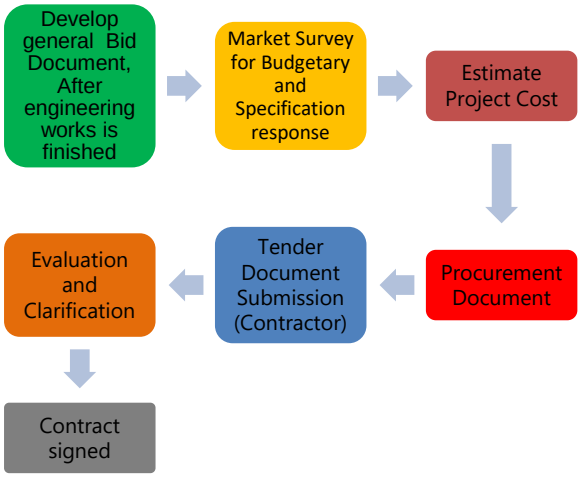

Figure 1: Contract Timeline

2.1 Develop General Bid Document

After the drilling engineering team has completed the drilling program and technical scope of work, the contract engineering team (the Team) will develop the commercial form, general scope of work, term and agreement of service. This document is not the final bid document, instead it contains information about technical requirements, commercial form and scope of work necessary for the market survey.

2.2 Market Survey

The market survey is conducted by sending the inquiry to potential service or goods providers. Service providers will provide a fill-up list of equipment that they will offer comparing it with the Team's minimum technical requirement. With this kind of information, the Team will know the availability of its technical requirements. Also, in this market survey the service or goods provider will submit their budget on a commercial form.

2.3 Estimate the Owner Project

Data that the Team have collected from the market survey will be used to define the estimation cost of project (Owner estimate). There are several methods used to calculate the owner estimate, mainly using statistics calculations. As for statistical data, quantity data is extensive to be able to determine a more precise owner estimate calculation.

2.4 Procurement Document

The procurement document consists of a Term of Reference, body of contract, tender form, scope of work, commercial form, technical form, administration form, and bid bond form.

2.5 Tender Document Submission

The tender document submission is based on a project time schedule. The service or goods provider will submit all their proposals for technical requirements, fill up the commercial form, and fill all the other requirement in the tender document.

2.6 Evaluation and Clarification

Normally in a drilling service contract a 'one stage, two envelope' process is applied to complex scopes of work, where the company evaluates the technical provisions first, and if the service or goods provider passes the technical evaluation they will eligible to compete on the commercial proposal.

The lowest bidder will be invited to conduct the negotiation with the company with the expectation that the company will get a more competitive price that way.

2.7 Contract Signed

The last stage of contract preparation is a signed contract after both parties agree on the negotiation process.

3. DISCRETE CONTRACT

3.1 Definition

This is a term recently used by drilling personnel in Indonesia referring to the most conventional type of drilling contract where the geothermal developer is contracting separately with the rig contractor and every other service company. This kind of approach may create a lot of contract documents, 15-25 in estimate.

4. INTEGRATED PROJECT MANAGEMENT (IPM)

4.1 Definition

This is a term used by drilling personnel in Indonesia in describing the type of contract that brings together several drilling services into a single contract. The contractor is also responsible for designing the drilling program. Companies that become contract leaders have a project management team that is responsible for developing the drilling program and managing the day to day drilling operation.

5. INTEGRATED DRILLING SERVICE (BUNDLED)

5.1 Definition

This is a term used by drilling personnel in Indonesia in describing the type of contract that brings together several drilling services into a single contract. This is done with the aim of facilitating coordination with drilling service companies because developers only need to communicate with one project coordinator. Companies that become contract leaders can be in the form of drilling rig company or other drilling service companies such as directional drilling, cementing, or other services.

6. CASE STUDY

6.1 Application Geothermal Drilling Contract in Indonesia

Supreme Energy is an experienced geothermal company in Indonesia. Supreme Energy was established in October 2007. Supreme has its own organization to run geothermal drilling projects and has already drilled several wells in its campaign. Supreme Energy has had experience using several types of contract. For the recent geothermal drilling campaign, it used the discrete contract type, which it calls direct drilling management. Management of the drilling project engineering, procurement, and contracting and execution is carried out by the employer and is accountable to the company.

It is a different case with Sarulla Operation Limited (SOL) although the company itself has been established for quite

some time, but until now they have only one geothermal drilling project in north Sumatra. They used the IPM contract type for their drilling campaign. They have a quite small drilling organization team for handling their drilling campaign.

The Indonesian renewable energy regulator (EBTKE) team in 2015 published a study regarding drilling cost per metre for several geothermal wells in Indonesia. Their study collected drilling costs for every geothermal well in Indonesia and grouped them based on what contract type was used to execute the drilling of each well. Their study came up with a diagram comparison of cost per metre average for every contract type.

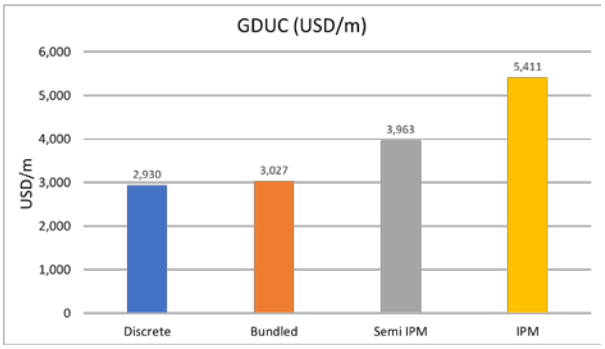

Figure 2: Geothermal Drilling Unit Cost (Modified from Purwanto et all., 2018).

6.2 *Project Cost*

There is additional cost if IPM or bundling type of contract is used. On the bundling contract, the main contractor will take an additional handling fee from their subcontractor. Also, under the Indonesian tax regulation, with the IPM/bundling scheme the company must pay double tax to accommodate two steps of payment from main contractor to their subcontractor and from company to its main contractor. On the IPM contract, besides handling fee and double tax the company will be charged a Project management fee that consists of an engineering fee, personnel fee and other fee to manage the operation.

The illustration below describes how this additional cost is accommodated in a bundled contract.

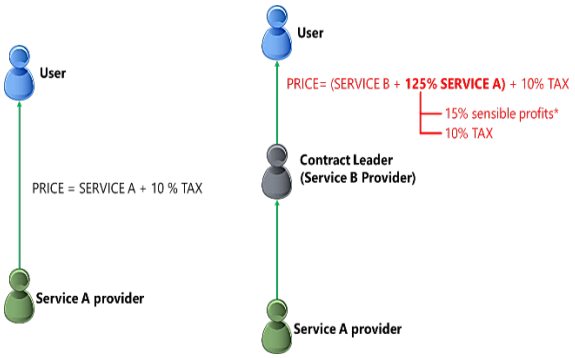

Figure 3: Handling Fee and Double Tax.

6.3 *Procurement Process*

From the procurement process and timeline, we consider that the IPM contract will require less time than the procurement process and timeline for the bundling and discrete contract type. We know that the IPM type of contract usually just has one contract. There is a significant time advantage to procuring one contract compared to IDS, which has 5- 10 contracts and discrete contracts, in which there are 20 – 25 contractors.

6.4 *Personnel required*

From the drilling engineering point of view, bundling and discrete contract types both require a sufficiently resourced drilling engineering team. The engineering team will provide and develop all drilling engineering documents for the bidding document. It's different with the IPM type of contract since all the drilling engineering work will be provided by the IPM contractor. The company is usually just required to have a drilling engineering reviewer to review and give approval of drilling engineering documents proposed by the IPM contractor. Whatever contract type is used, there must be a qualified drilling engineering team to develop the drilling engineering document. The difference is in the contract and procurement team that is required to develop and control the bid document and tender process. Discrete types of contract need the company to have more personnel to develop and control the procurement and contract process because they must develop each bidding and contract document for each service, so for the example based on a standard drilling contract in Indonesia they must prepare 15-25 bidding and contract documents. IPM/bundling has the benefits when it comes to purchase services or goods because the company could have less personnel monitoring all the contracts.

Also, for managing the contract, since IPM has only one contractor and one contract the company doesn't need many human resources to manage the contract.

6.5 *Project Control*

We consider that the discrete type of contract will lead to more effective operation and communication, and less potential for disputes between parties. The company will have a direct contract for each service. This means the company can control each service without intervention with other services from the same services provider. Although to manage the contract IPM does not need many human resources, from a project control point view managing an IPM contract is difficult since the company does not have direct control of each service and there is no flexibility to change the program.

7. CONCLUSION

Based on our study, there are advantages and disadvantages of each drilling contract type. If the geothermal company has sufficient quality and quantity resources, and a reasonable timeline, using a discrete contract is suggested for cost efficiency and the ability to have full control of the drilling operation. If the geothermal company lacks resources and has a very tight schedule, an IPM contract can be the best option to deliver the project to schedule. Another thing to be considered is company experience, and company policy to choose the most suitable drilling contract type.

The following figure shows advantages and disadvantages of each drilling contract type.

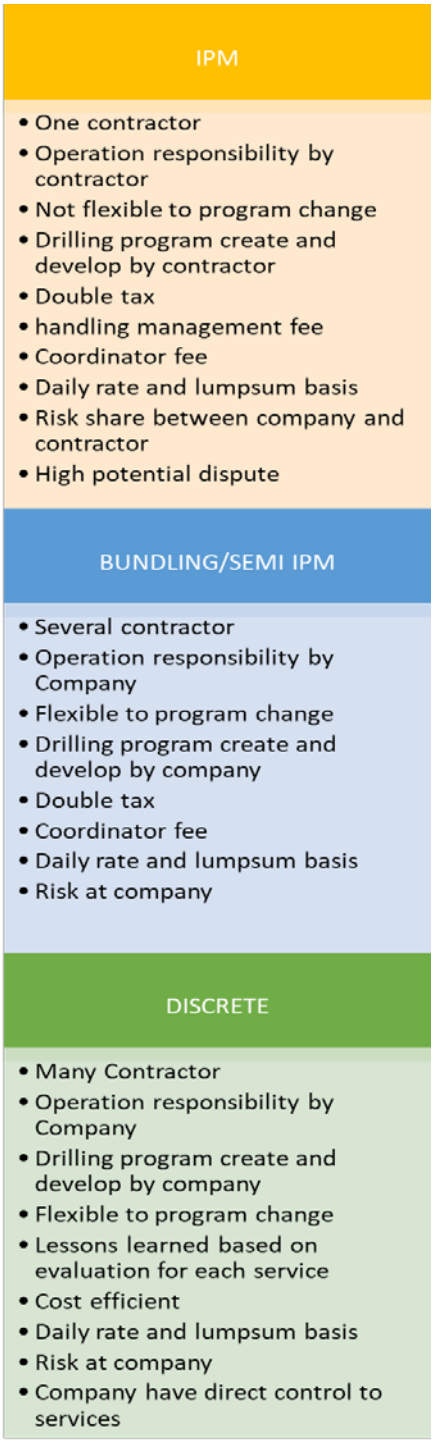

Figure 4: Advantages and Disadvantages of Several Contract Types .

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