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Selection of IPM Geothermal Drilling Contractor Through a Merit Point System Using the Analytical Hierarchy Process Afif Effendi Airlangga University, Surabaya, Indonesia ABSTRACT One method of evaluating the procurement is a merit point system (value system). In a merit point system price is one of the evaluation criteria, with the understanding that the more complex technical requirements and the more difficult to compare bid proposals, the lower the price weights. In general, the total value for technical bids is higher than price bids.

At the auction using the merit point system, there are two main things that greatly affect the results of procurement, namely the determination of technical weighting and the price that will be used when evaluating bids and the method of weighing technical bids. When this is done correctly and appropriately, the company will get the right contractor in accordance with needs and can avoid the opportunity to commit fraud or corruption in the process of procurement.

For this reason, the authors conduct research on the determination of technical weight and price as well as the method of weighting technical offerings with a case study of the selection of contracting IPM Geothermal Drilling through the Analytical Hierarchy Process (AHP) approach where the results of the study indicate that the AHP can assist the Procurement Planner to determine the technical weight and price as a reference for evaluating bids through the Merit Point System.

AHP also helps the Procurement Implementer to rank technical bids during the technical evaluation. Keywords: merit point system, analytical hierarchy process, IPM Geothermal Drilling INTRODUCTION According to the World Bank in the Guidelines for Selection and Emlopyment of Consultants it is stated that it is possible to conduct an evaluation

using the Merit Point System.

The total score must be obtained by weighing the quality and cost scores and adding them. Weights for "costs" must be chosen, taking into account the complexity of the assignment and the importance of quality. However Lorentziades (2010) argues that a merit point system has the potential to cause fraud in the procurement of goods and services, this is because the weighting is done subjectively.

Subjectivity is carried out when determining the technical weight and price and when conducting the evaluation by carrying out technical weighting and price. The inaccuracy in determining the technical weight and price and the implementation of the weighting at the time of the evaluation can benefit certain bidders so that it can lead to the possibility of the service user getting a contractor that is less appropriate.

In the procurement of services is strongly influenced by the technical quality of the vendor where the weighting process of technical quality is determined at the time of technical evaluation. The technical quality of service procurement is different from the procurement of goods. The technical quality of service provision is determined by several technical criteria that are difficult to measure quantitatively.

So that in the procurement of services using the merit point evaluation system required criteria and sub-criteria to measure the technical quality of vendors. Appraisal during technical evaluation using a merit point system often experiences difficulties due to high subjective factors and the ability of appraisers to assess technical offerings.

Maksum Tanubrata and Milsa Eachutri (2010) states that the determination of the weight of technical evaluation and the cost of free offer determined by the procurement planner depends on the specifications, company needs and the level of complexity of the work. Different technical weight values ??and prices can affect / change the order of potential auction winners so an approach method that can determine the technical weight and price is needed. The selection of contractors is one of the most important activities in the process of procuring goods and services.

At the auction using the merit point system there are 2 (two) main things that greatly affect the results of procurement, namely: a. Weight between technical and price b. Method of weighing technical bids When these 2 (two) things are done correctly and appropriately, the company will get a contractor that meets the needs and can avoid the opportunity to commit fraud or corruption in the procurement process.

One procurement that uses a merit point system evaluation method is the Integrated

Project Management (IPM) Drilling of Geothermal. High complexity in IPM Geothermal Drilling work causes a high risk of work, so the costs involved are also high. With this high risk, the technical quality of the IPM Geothermal Drilling contractor must meet the requirements and be feasible to carry out the work of IPM Geothermal Drilling.

To avoid subjectivity when determining technical weight and price as well as conducting technical evaluations to obtain a technical rating, then an approach method is needed for the selection of IPM Geothermal Drilling contractors. According to A. Jyant, A. Sngh and V. Patel (2011) vendor selection by weighting evaluation can be done with the Analytical Hiercy Process (AHP) method approach.

The use of the AHP method approach applies in various types of industries to select vendors with the main advantage can be used for qualitative and quantitative criteria and allows decision makers to handle inconsistent assessments systematically. For this reason, the authors conducted research on determining technical weight and price as well as a method of weighting technical offerings aimed at selecting the right contractor for the work of Integrated Project Management (IPM) Drilling through the Analytical Hierarchy Process (AHP) approach.. 2.

LITERATURE REVIEW 2.1 MERIT POINT SYSTEM Dini, Pacini and Valetti (2006) state that when quality is important from procurement and flexibility is needed to control the balance between price and quality, the scoring mechanism or merit point system is very appropriate.

A merit point system for procurement of goods and services can be given by considering several non-price attributes including various measurements of quality. In this case it is usually called the technical aspect to emphasize the fact that the technical aspects are quite easy to measure. The assessment that is relevant for the technical aspects of the procurement of goods and services involves a weighting scheme that allows the buyer to award the contract not only based on the lowest price but the best price that is a combination with quality.

The weighting of the technical aspects implies setting the scoring rules or merit point system, which is the mechanism that sets the scores for each contract dimension so that the total score determines the total Bidder value. Total value is an important 'number' which allows the ranking of the supplier price and quality to be the basis for the winner (called the Contractor).

The merit point system also aims to maintain a balance between price and quality. Usually good quality involves high prices, so good technical offers tend to be associated

with high bid prices. Low quality has the opposite meaning and tends to be offered at low prices.

Because Buyers want to buy a valuable product at a low price, price and quality are conflicting general objectives. Therefore, Buyers see the balance of price and quality between cheap and low quality and expensive with high quality is expected to have different valuation rules to determine the order / ranking of different combinations of prices and the same quality and then different winners.

To convert prices into scores, the following method can be performed : Lowest Bid Scoring (Lo) Formula : Price Score = nn * [Lowest Bid/ Price Bid] Highest Bid Scoring (Hs) Formula : Price score = nn * (highest bid – price bid) / (highest bid – lowest bid) Average Scoring (As) Formula : Price score = nn * (highest bid-price bid)/(highest bid-average bid) 2.2

IPM DRILLING Integrated Project Management (IPM) Drilling is a combination of several units of integrated drilling activities under one roof with the Turnkey method. In a drilling project, the Goods / Services Users must prepare several tender processes (Drilling Rig, Mud Services, Cementing, Wireline Logging, Mud Logging, etc.) so that this takes a very long time, energy and cost.

With the IPM Drilling concept, all activities needed in the drilling process will be integrated in one tender so that time, energy and costs can be saved. Eko Hari Purwanto, Eko Suwarno, R. Fitrah Lukman and Budi Herdiyanto (2018) IPM Drilling contracts are generally used when geothermal companies have limited organization capabilities in preparing and carrying out drilling.

This type of contract uses only 1 contract but is very dependent on the IPM Drilling contractor and it is difficult to replace one service but it is well suited to an exploration area that only specifies a small amount of drilling. IPM Drilling can be obtained by aligning the objectives of operators and service companies and providing incentives to produce projects faster, better and safer.

One of the main benefits for operators in choosing the IPM Drilling approach is the ability of the project management team to apply learning from well to well, thereby reducing costs. The IPM Drilling contract strategy also has its own shortcomings that is when a contract is not structured properly there will be potential for disputes due to the changing nature of the risk because it is not known in advance and the service company is trying to recover additional and unplanned expenses. 2.2

ANALYTICAL HIERARCHI PROCESS Analytical Hierarchy Process (AHP) is a decision support model developed by Thomas L. Saaty. Analytical Hierarchy Process (AHP) explains the multifactorial or multi-criteria problem so that it becomes a hierarchy or a unit. Hierarchy is a representation of a complex problem in a multi-level structure consisting of the level of objectives, level of factors, level of criteria, level of sub criteria to the last level of alternatives that exist.

Hierarchy makes a complex problem can be broken down into groups so that the problem becomes more structured and systematic (Saragih, 2013). In addition, the Analytical Hierarchy Process (AHP) is done by pairwise comparisons, calculating weighting factors and conducting analyzes to produce relative priorities among alternatives. Analyticl Hierarchy Process (AHP) is considered as a simple and flexible method that accommodates creativity to solve a problem (Herjanto, 2009).

The multi-criteria problem in AHP is simplified in the form of a hierarchy consisting of 3 main components. That is the purpose or goal of decision making, assessment criteria and alternative choices. Related to the criteria and alternatives to the hierarchical structure in the Analytical Hierarchy Process (AHP), basically these two things are not determined by certain factors but rather they are assessed through pairwise comparisons.

The pairwise comparison is done with the help of a scale of 1 to 9, which is the best scale that can express opinions so that if there is one criterion or alternative that is less appropriate then it will be replaced with other criteria or alternatives. The following comparison scale on criteria and alternatives (Marimin, 2004). Table 1. AHP Scale / 3. AN AHP APPROACH 3.1

CRITERIA AND HIERARCHY In this research, the writer uses analytic hierarchy process approach to calculate the weight between technical and price that will be used as a basis for a merit point system. After going through the Forum Group Discussion the technical weight is determined by the criteria : 1. T1 : IPM Implementation Program 2. T2 : Project Organization Structure 3. T3 : Project Schedule 4. T4 : Project Drilling Experiences 5.

T5 : Drilling Equipment System & Capabilities and Materials 6. T6 :Well Design & Drilling Program for this Drilling While the price weight is determined by the Price criteria : P1. The hierarchical structure of the above criteria is as follows : Figure 1. Hierarchical Structure / 3.2

TECHNICAL WEIGHT AND PRICE WEIGHT Weighting criteria using Expert Choice 11 by

entering the questionnaire results of each respondent. The weighting of these criteria also aims to determine the proportion between the price and the technicality that will be used in determining the winning bidder in the Merit Point system. Based on the results of Expert Choice 11, the following results were obtained : Figure 2.

Criteria Priorities / From the graph it can be seen that the weighting for the Price criteria is 20% and the Technical is 80% where the Drilling Equipment System & Capabilities and Materials get the highest priority at 22.8%. This means that the respondent believes in the Technical evaluation the most important thing in evaluating the selection of the Drilling IPM contractor is the Drilling Equipment System & Capabilities and Materials. Whereas the second priority is the Project Drilling Experiences with a weight of 15.8%, which is then followed by the third priority, the Well Design & Drilling Program for this Drilling Project with a weight of 14.9%.

Whereas the Project Schedule, IPM Implementation Program and Project Organization Structure criteria are respectively the fourth, fifth and sixth priority with weights of 10.7%, 9.1% and 6.8%. Based on the results of Expert Choice 11 obtained Consistency Ratio (CR) as follows: Table 2. Consistency Ratio (CR) / In the consistency test results it is seen that overall the CR value is 0.0047 and each respondent gets a CR value below 0.1.

This means that the evaluation of the criteria for consistency testing is consistent. 3.3 ALTERNATIVE WEIGHT OF CRITERIA An alternative weighting of all technical criteria can be obtained from the results of Dynamic Sensitivity and Performance Sensitivity obtained from Expert Choice 11. Figure 3. Dynamic Sensitivity / Figure 4.

Performance Sensitivity / From the results of Dynamic Sensitivity and Performance Sensitivity, the ranking order for alternative weighting to the overall technical criteria is as follows: - Rank 1 : Bidder B (37,2%) - Rank 2 : Bidder C (35,5%) - Rank 3 : Bidder A (27,4%) 3.4 ANALYSIS OF MERIT POINT SYSTEM From the results of the bid opening, Bidder A offered the lowest price, while Bidder B was 27.83% higher than Bidder C and Bidder B was 28.15% higher than Bidder C.

By using the Lowest Bid Scoring (Lo) method, the results obtained for Price and Technical scores are as follows : Table 3. Merit Point / Based on these results, the ranking order for technical and prices are as follows : - Rank 1 : Bidder B (95,65) - Rank 2 : Bidder C (91,95) - Rank 3 : Bidder A (78,92) Bidder A has the lowest price offer compared to Bidder B and Bidder C so that Bidder A gets the highest price score of 20.

However, Bidder A gets the lowest Technical Score of 58.92 because Bidder A receives the lowest weight in the alternative weighting rating against technical criteria. This

shows that the lowest price offer does not guarantee the Bidder to be the winner of the tender where quality is technically very influential in calculating the total score.

Bidder B has a price quote that is much more expensive than Bidder A and is slightly cheaper than Bidder C so that Bidder B gets a price score of 15.65. With the highest technical weight causing Bidder B to obtain the highest technical score of 80. With this acquisition the total Bidder B is the Bidder with the highest total score compared to Bidder A and C.

Under these conditions, the owner can get a Contractor with the best technical quality compared to other Bidders and get lower bid prices compared to Bidder C. Bidder C is a Bidder that offers the highest price compared to other Bidders so that it gets the lowest price score of 15.61. However, the technical score got 76.34 because Bidder C was still not good compared to Bidder B and better than Bidder A.

Even though Bidder C was in second place, the difference in total score between Bidder C and Bidder B was not far adrift. This shows that high prices can get high total scores as well by offering good technical quality. 4. CONCLUSION IPM Geothermal Drilling is a job with a high level of risk, so we need the right procurement method to get the right IPM Geothermal Drilling Bidder in accordance with the costs incurred.

Merit Point System is one of the procurement methods that can provide solutions to the evaluation needs of IPM Geothermal Drilling procurement. However, if the Merit Point System is not used carefully and correctly it will lead to potential fraud in the procurement of IPM Geothermal Drilling. The AHP approach in this study has proven that AHP can help to reduce subjectivity when evaluating bids using the Merit Point System method.

The owner will get contractor who can be more accountable for the results of their evaluations. A Bidder who offers a low price is not necessarily the winner of the tender because the technical aspects are the dominant aspects taken into account in the procurement of this IPM Geothermal Drilling. In this study it was also shown that the price did not indicate the technical quality offered by the Bidder.

High prices do not necessarily have good technical quality. With the AHP approach, the Procurement Planners who compile Bidding Documents will be able to determine the Technical and Price weights as the basis for evaluating bids. Whereas the Procurement Implementer can use the AHP approach to get a technical rating at the time of technical evaluation.

On the other hand the user will get a contractor with good technical quality and reasonable prices. REFERENCES Alam, G., Singh, M. P., and Singh, A., 2011, Wound Healing Potential of Some Medical Plants, Int. J. Pharm. Sci. Rev. Res., 9 (1): 136-145. Creswell, John W. 2013. Qualitative inquiry and research design: Choosing among five approaches. Thousand Oaks, CA: Sage Gayatri, S Vyas ., Chetan, S Misal. (2013).

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