Analysis Factors and Decision Strategies Dealing with Ongoing Project Delay in RDMP Balikpapan Project

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ABSTRACT

The business activity in oil & gas sector may include accounting and financing, research and development, manufacturing, marketing, sales, safety, and supply chain process. If we look further and deep one of those business activities, there will be a project phase, that is the construction all the facility project before all the main business activities run. This stage is called the end-to-end project phase which consists of each step from conceptual study, licensor selection, feasibility study, contractor selection, until finally the operation step. After this last step, the normal business activities of a company will proceed by the rule with the company's core business and in achieving profits and/or goals.

PT. KPB, a subsidiary of National Oil Company, was tasked with executing the Balikpapan RDMP mega project, the project will increase refinery capacity, improve product quality, and reduce the cost of production of fuel oil which will encourage an increase in foreign exchange and tax revenues. This effort is carried out in order to realize energy independence and reduce the current account deficit (CAD), by reducing imports of fuel and petrochemical products significantly.

By having appointed joint operations of four domestic and foreign companies, these are SK Engineering & Construction Co Ltd from Korea, Hyundai Engineering Co Ltd from Korea too, PT Rekayasa Industri, and PT PP Tbk from Indonesia (hereinafter referred to as JO SHRP), as of the end of 2021, the RDMP Balikpapan project has achieved physical progress of around 40% in the construction phase, the construction phase is a part of the 5th stage referring to Fig. 1. RDMP Balikpapan Project End-to-End Phases, it calls the EPC (Engineering, Procurement, and Construction) phase. The Balikpapan RDMP Project has also achieved several milestones in the Balikpapan RDMP. Until the end of the first quarter of 2021, the project has achieved several milestones, namely the delivery and installation of 5 boilers.

The scope of the construction phase that is a business issue here is a part of the EPC phase, with additional information that the procurement of goods that are part of the scope of Procurement, especially for long lead items, has been running since the beginning according to the normal project timeline,

Fig. 1. EPC End to End Phase and Owner structural position. Source: company document.

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as well as engineering document review, approval Document engineering and matters related to scope engineering have also been running parallel since the beginning according to the normal project timeline. Therefore, in the discussion that follows, the author will draw a line between the scope of the engineering, procurement, and construction phases, and focus on issues related to the construction phase in more detail.

II. BUSINESS ISSUE

Within the scope of the construction phase of each project including the Balikpapan RDMP for the main activities of implementing on site work including: ensure and review documents, drawings, procedures, job safety analysis, work method and permit document, ensure and solve if there is a lack of documents and coordinating with related functions and parties, planning and ensure activities of execution work methods, planning resources in term equipment, manpower, tools, and materials, coordination of resource arrangements with all parties rely on and sub-contractors, coordination of types of work, job risks to the area owner or related owner, planning for materials originating from outside the region and requiring a long-time delivery.

After several predecessor activities above have been appropriated, then the construction division as the main player in the construction phase ensures that all activities are on target, on budget, and on schedule.

One indication of a potential problem at this point is that, as can be seen from the overall construction progress curve above, the project work objectives cannot be completed on target schedule. Paying attention to the curve that the target base monthly progress (blue) and actual monthly progress (green) have been running concurrently in mid-2019, but month to month there is a deviation gap between the actual and target base so that the forecast becomes dynamic and estimate project delays and projects will be completed exceed the specified time.

By looking at Fig. 2 that is always updated based on daily physical progress data achieved on site and regularly updated every week and month, it can be stated that the Balikpapan RDMP project, which is currently ongoing process is delays.

III. LITERATURE REVIEW

Author explains the business issue exploration method used in this research to determine the strategic decision and relate it to several scientific literature and existing methods. The author will use 3 literatures in writing research.

A. Interview in Research

In the theoretical and practical implementation, there are many types of interviews that maybe not all people know and consider as shown in Fig. 3. An interview is generally a qualitative research technique that asks open-ended questions in order to converse with respondents and gather data on a subject.

In this research the author will focus on personal interview option, In-person interviews are one of the most common types of interviews where questions are asked directly to the respondent. and the researcher has an opportunity to detect and analyze the interviewee’s respond immediately at the time of asking the questions and taking notes about it.

B. Six Sigma Analytical Method and Tools

Six Sigma is a method that have continuously improvement and also involves trams in the process and is carried out continuously and continuously on a system. Another definition Six Sigma from TQM is a program designed to reduce defects to help lower costs, and time efficiency. Six Sigma is a comprehensive system, strategy, and set of tools for achieving and sustaining business goals. In this research, author use DMAIC improvement model, Pareto, and fishbone diagram as well.

![Fig. 2. Overall Construction Progress S Curve. Source: company document.](image-url)

![Fig. 3. Type of Interview in Research. Source: question pro.](image-url)
C. Critical Patch Analysis

CPA is a technique for identifying the tasks needed to prioritize project completion and determine the flexibility of project scheduling that will run or is in progress. In its application, there is a critical path in project management which is the longest sequence of activities that need to be performed in time so that the entire project is completed at the same time it is also seen that any delay in critical tasks will delay the rest of the project.

IV. METHODOLOGY

This research begins with the identification stage of the problem that occurs in the company that results in delays in project progress, both from technical and non-technical factors. The existing problems need to be analyzed and evaluated what is the right solution to handle the problem.

The methodology used in this is to perform mixed method approaches, those are qualitative research methods, technical data analysis, and non-technical data analysis. This mixed method was chosen by the author to understand the complexity and size of the project so that it can determine the best decision.

Through qualitative method approaches, the author tries to find out the obstacles faced by the project from the point of view of experts and expertise for their experience and knowledge.

In addition, the author also includes and discusses comprehensive technical and non-technical data analysis to sharpen the expertise opinion with the actual condition of the current project internal data source.

V. BUSINESS EXPLORATION

According to the method research, the data obtained by the author included technical data analysis and non-technical data analysis, as well as field observations in the field, and analyzed through qualitative research data from experts and owner’s perspective. The result is a comprehensive root cause analysis using Six Sigma analysis tools.

The Pareto charts below are the results of respondents based on the frequency of presentations on certain topics, each of which was highlighted and repeated for the root cause analysis of project delays.

Then, for the analysis method of some technical data, the author adopts the critical path analysis method (CPA) or is called the critical path method (CPM) in practice. Analytical data collected based on process mapping will be displayed in the table below for critical path activities and construction project phases in the CPM network.

The B (civil work) as a critical item which shows B is the most critical item since A has been completed in the previous year. Furthermore, to make a summary of all available data and find the root cause analysis for project delay, the author uses one of the Six Sigma fishbone diagrams – Ishikawa diagrams.

Based on finding, discussions, confirmation of the results of research expertise, and reconfirm through Fishbone Diagram above where the delay depicted head of the fish, six major cases as the ribs’ branch and sub or sub branch as the root cause, it was found that characteristic factors (red font) that considered as seven root cause of the RDMP RU V Balikpapan project delay are as follow:

- Imperfect contract documents;
- Division of project aspect;
- Resources aspect;
- Leadership styles;
- Bureaucracy factor;
- The civil work;
- Pandemic Covid-19.

Fig. 4. Pareto Chart Frequency of Statement Research. Source: authors, 2022.
VI. CONCLUSION AND SOLUTION

On the project, especially such a huge project called Mega project with peak manpower load of 20 thousand people, having and letting the long delay project bigger and bigger will only create a snowball phenomenon that at first looks small and affects some the project scope is small, but over time it becomes a serious issue for all scopes, disciplines, divisions, and becomes a huge concern when overall company performance is affected. The strategy decision taken can be ineffective and inefficient if the root cause of the project delay has not been clearly identified, resolved, or mitigated.

In the final research methodology, identification of the problem that occurs in the company that results in delays in progress through mixed method approaches has been carried out, these are technical data analysis, non-technical data analysis, and qualitative research methods.

Based on fact finding technical and non-technical data, discussions, confirmation of the results of research expertise, and the use of analytical tools, it was found that 7 (seven) characteristic factors that were considered as the root cause of the RDMP RU V Balikpapan project delay.

The first, contract document. A written document that defines the work and responsibilities under the project contract including construction contracts. These documents are legally binding for both the owner and the contractor. It is a commitment for both the contractor and the client that defines terms related to the executed work, price, and the amount of compensation, but somehow in this project some expertise is seen as an imperfect document, so there are many gaps that can be exploited by the contractor either for draining the owner's energy in a tiring argument discussion or an opportunity to attack the owner in the form of an additional claim or also an extension of time without a fine. The solution to overcome this problem is to strengthen document control, which can be through accelerating the recruitment of vacant positions in the contract division, recruiting highflyer managers and teams from outside the company.

Second, unsustainable division of projects. Paying attention to the historical project from the beginning since the conceptual study stage was carried out by several different people or departments, each stage has a number of key persons, and unfortunately each stage has a different core team and key person. In this process chain, there is a lack of consistency and a continuous and critical flow of information from each stage. One of the solutions to overcome this problem is to form a core team with responsibility and
authority to oversee the overall issue of the project and deliver new solutions until the end of the project and operational acceptance.

Third, manpower issues in all lines. The number of manpower projects brought in by the main contractor from the data shows the number is far from the plan with a gap of 4,000–5,000 manpower or even more that must be brought into the project site. Apart from the number of front line and worker levels, in the project organizational structure of both the Contractor and the Owner there are also vacant positions, these positions must be filled immediately to improve the effectiveness, focus, and performance of the two companies. One of the main solutions to overcome this problem is that contractors must have a breakthrough to bring in 4,000 workers in a short period of time.

Fourth, leadership style. The top management, BOD, and positions in top organizations that can influence decision strategy have changed several times during the Balikpapan RDMP project to date, each leader has a different leadership style, some are coercive, pacifying, and democratic. Individual differences, leadership styles, and not so long lead times, can affect the decisions made and potentially not align with the previous leader's policies, decisions taken on a Mega project scale can have future implications, some time take to adjust and even reshuffle from scratch. The solution to overcome this problem is to create a good leadership style through people development programs, for example, and it is hoped that in the future there will not be frequent replacements of project managers, top management, and positions above them in order to be able to maintain continuity, strong relationship management or leader and his team, project commitment, and continuing decisions, that has been made, continue the acceleration program that has been running, and reduce inconsistencies and useless policies.

Fifth, the bureaucracy. The ideal project organization is able to produce decisions quickly and does not require a long bureaucracy, some cases where decision making takes up to several months due to bureaucracy. To mitigate bureaucratic problems, there are several alternative solutions, such as simplification of project procedures that have been frequently used and time-consuming, the others is seeking organizational programs in an effort to eliminate silos in the company.

Sixth, the civil work activity. Refer critical path analysis, the most critical item construction activity is civil work, this work contributes and is linearly correlated with the overall project delay. To overcome the problem of low productivity of civil work, several alternative solutions are offered, such as solving financial cash flow problems in several subcontracting companies, changing the material supply procurement scheme from sub-contractors to main contractors, especially for sub-contractors that have cash flow issues, and locating more additional workshops areas.

The last, Pandemic Covid-19. This issue is correlated and adds to the list of obstacles in the manpower issue, since the initial planning of the manpower resorts in the Balikpapan RDMP project for manual labor and non-skilled workers, the majority of which came from local Indonesia, Balikpapan, East Kalimantan, and Java Island, but since June 2020 (first wave) the movement of people has been limited, following 2021 (second wave) and now repeating itself in early 2022 (third wave). Lots of prevention and remedies to overcome this problem such as forming and activating a special task force team for monitoring and socialize on the site, performing routine antigens biweekly, and accelerate vaccination & booster programs.

REFERENCES


Collins, J. (2001). In Good to Great: Why Some Companies Make the Leap and Others Don't (p. 201).


Hengky was born on August 14, 1986, in Palembang, Indonesia. He completed his studies at Sriwijaya University, Palembang Indonesia in 2010 with a bachelor's degree in chemical engineering parallel a 2-year internship experience in a state-owned company engaged in electrical and power business. He then joined a private company in the chemical business and finally, until now, he joined Indonesia's state-owned oil company.

The author has a lot of knowledge and involvement in business, strategy, process and project refinement during his career at a company with oil and gas as its primary business. Coupled with this enthusiasm, the author went on to pursue a postgraduate study in the MBA program at Bandung Institute of Technology, Indonesia, to be completed in 2022.