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EVALUATION STUDY OF THE CONSTRUCTION SCHEDULE OF THE GUNUNG KUPANG RESERVOIR WITH ADDITIONAL WORKING HOURS USING THE CRASHING METHOD

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ABSTRACT

In development, there are often obstacles and success factors. Delays in the work of a project are considered very detrimental so that scheduling is accelerated by one method, namely by crashing.In the Gunung Kupang Reservoir Development Project, Cempaka District, Cempaka District, experienced a delay in realization due to the implementation of inappropriate work methods. An alternative is carried out in the form of acceleration of the remaining work by applying the crash program method with additional working hours.

The crash program is carried out on activities that are on a critical trajectory with the help of a scheduling application. Then crashing is carried out on the rest of the work with the alternative of adding 3 (three) working hours and 4 (four) working hours. After the crashing results are obtained , a comparison of time and cost efficiency is carried out between the work by paying fines, and adding working hours.

From the results of the study, it was found that work by paying fines is a more efficient method of implementation than accelerating. Where the implementation cost by paying a fine has a total cost of Rp. 3,678,274,868.15 while accelerating the project for 3 (three) hours with a total cost of Rp. 3,721,415,450.19, and accelerating the project for 4 (four) hours with a total cost of Rp. 3,700,800,405.34. So that an efficient cost budget is to do the work by paying fines rather than accelerating.

Keywords: Construction delays, Project Acceleration, Scheduling apps, crash program, Addition of working hours.

1. INTRODUCTION

In development, there are often obstacles and success factors. In general, project planning based on budget, schedule, cost and quality is a measure of the success of a project. These obstacles are generally the cause of delays in work, such as in the construction project of the Gunung Kupang Reservoir, Cempaka District, Cempaka

District. The occurrence of project delays generally triggers an implementing contractor to accelerate/accelerate the project into a solution based on delays.

The Gunung Kupang Embankment, Cempaka District, Cempaka District, was built with the aim of reducing flooding for the Cempaka area and its surroundings. The obstacles to the delay in the construction of this reservoir have several factors, one of which is the method of carrying out the work. Because due to the delay that occurred, acceleration/acceleration will be carried out using the crash program method, in order to find out whether the costs incurred for additional working hours are proven to be more efficient than adding time by paying a fine.

2. THEORETICAL FOUNDATIONS

2.1 Project Management

Project management is the application of science, expertise and skills using the best technical methods in using limited resources to achieve predetermined goals in optimizing cost performance, quality and time and work safety. (Husen, 2009:4)

2.2 Project Delays

Project delays generally cause losses for owners as well as contractors as executors, because the influence of delays is who is responsible, cost demands and increased time. (Praboyo, 1999)

2.3 Project Acceleration

(Budi Suanda: 2016) revealed that there are several other ways that can be achieved in acceleration, including:

1. Priority on critical paths is carried out on planning, sequence implementation of activities, availability of resources and problem solving.
2. Replacing human resources with tools.
3. Use the most productive tools.
4. Accelerating the implementation of the project from the start of the project, this is to reduce the level of multi-tasking that occurs.
5. Prefabricated design with high quality structural materials.
6. Addition of manpower and working hours.
7. Increased productivity of the enabling tools.

2.4 Precedence Diagram Method (PDM)

Scheduling using a known Activity on Node is the Precedence Diagram Method (PDM). Activities in PDM are described using nodes (sometimes in the form of squares) and arrows (arrows) that describe their relationships. In AON/PDM there are 4 different logical relationships/constrains, namely: Degree of saturation, obtained using the following equation formula:

1. Finish to Finish (FF)

   FF is a relationship that shows that after (finish) the next activity (succesor) depends on the end of the previous activity (predecessor).

   EFj = EFi + FFij atau ESj = EFj - Dj……. (2.1)

2. Finish to Start (FS)

   FS is a relationship that shows that the beginning of the next activity (successor) depends on the end (finish) of the previous activity (predecessor).

   ESj = EFi + FSij atau EFj = ESj + Dj……. (2.2)

3. Start to Start (SS)

   SS is a relationship that shows that the beginning of the next activity (successor) depends on the beginning of the previous activity (predecessor).

   ESj = EFi + FSij atau EFj = ESj + Dj……. (2.3)

4. Start to Finish (SF)

   SF is a relationship that shows that the final (fisnish) of the next activity (successor) depends on the beginning of the previous activity (predecessor)

   EFj = ESi + SFij atau ESj = ESFj - Dj……. (2.4)

2.5 Network Planning

A network is a tool used to plan, schedule & monitor the progress of a project. (Nurhayati, 2010).

2.6 Critical Path

The critical path is the path that has the longest cycle & time contained in all networks (Render, 2014: 105).

2.7 Scheduling Apps

The Scheduling application is used to manage plans or task times which is very practical to plan, control, and connect activities and information on a project. A structure that defines the work elements that are arranged and completed in the order of work established by the network diagram to complete the project. The purpose of scheduling in the Scheduling Application is to know the duration of the project, control the schedule created, create the optimal duration, and allocate the resources used.

2.8 Crashing Method

The crashing method is a decision to reduce the overall work time in order to catch up with various lags by cost-efficient at the lowest possible cost using predetermined quality. (Taufiqur Rahman, 2013).

3. METHOD

3.1 Research method

This study is an analytical study to find out the cost efficiency that comes out if it is accelerated and then compared to the fines that must be paid in the event of delays.

3.2 Research location

Penelitian ini berlokasi di Kel. Cempaka Kec. Cempaka, Provinsi Kalimantan Selatan.

3.3 Data capture

1. Primary data is data obtained from direct research.
2. Secondary Data is data obtained indirectly to complement primary data. The secondary data used in this study is the work implementation schedule (S Curve), implementation method, plan drawings, Cost Budget Plan and project progress report.

3.4 Data processing and analysis

The data reviewed in this study is project data from the 10th week which is the initial time in the delay in this project. To analyze the critical path for the calculation of project acceleration, the calculation uses the Precedence Diagram Method (PDM) assisted by Microsoft office Excel and Microsoft office Project.

3.5 Research procedure

1. Conduct interviews with related parties to obtain initial information.
2. Collect the data needed to analyze the project.
3. Primary data consist of direct interviews, secondary data consists of work implementation schedules (Curve S), plan drawings, RAB, and project progress reports.
4. Project data input is carried out on ms.project.
5. Determining relationships between jobs
6. Calculate the remaining work on critical trajectories.
7. Calculate daily productivity.
8. Calculate acceleration with additional working hours.
9. Calculate the cost slope of each job.
10. Crash/accelerate on the cost slope of the highest rank.
11. The final step is to input the crash result in. ms.project.

4. RESULTS AND DISCUSSION

Cost comparison analysis is used to determine the difference in costs between implementation and paying fines, acceleration costs with an additional 3 hours and 4 hours of work (overtime). Aim to find out which acceleration has the most efficient results.

table 4.1 Direct cost comparison

KETERANGAN	Pelaksanaan dengan membayar denda (Rp)	Lembur (Rp)	Lembur (Rp)
		(3 Jam)	(4 Jam)
Waktu (hari)	248	225	210
Biaya Percepatan		127.444.581,18	161.810.405,34
Total Biaya	3.505.390.000,00	3.632.834.581,18	3.667.200.405,34

Graphics 4.1 Comparison of the total cost of implementation by paying fines, and overtime work

5. CONCLUSION

From the results of the analysis, discussion, and purpose of this evaluation study to find cost-effective costs when accelerating the project or only by paying fines, it can be concluded that the implementation method used by not accelerating and paying fines is more efficient than using the acceleration method, it can be seen from graph 4.2 where the implementation cost by paying fines is more efficient with a total cost of Rp. 3,678,274,868.15 compared to by accelerating the project for 3 (three) hours with a total cost of Rp. 3,721,415,450.19, and accelerating the project for 4 (four) hours with a total cost of Rp. 3,700,800,405.34.

DAFTAR PUSTAKA

1. Anggraeni, Elisabeth Riska. Hartanto, Widi. Sugiyarto. 2017. Analisis Percepatan Proyek Menggunakan Metode Crashing Dengan Penambahan Tenaga Kerja Dan Shift Kerja (Studi Kasus : Proyek Pembangunan Hotel Grand Keisha, Yogyakarta). (Tidak diterbitkan), Universitas Sebelas Maret.
2. Ervianto. 2005. Manajemen Proyek Konstruksi, Edisi Revisi. Yogyakarta: Andi.
3. Hanna, 2008. Impact Of Shift Work On Labor Productivity For Labor Intensive Contractor. Journal Of Construction Engineering And ManagementPeraturan

Pemerintah No. 43. (1993). Tentang Prasarana dan Lalu Lintas Jalan. Jakarta: Pemerintah Republik Indonesia.

4. Husen. 2009. Manajemen Proyek: Perencanaan, Penjadwalan, dan Pengendalian Proyek. Yogyakarta: Andi.
5. Keputusan Menteri Tenaga Kerja No. KEP-102/MEN/VI/2004 Tentang Waktu Kerja Lembur Dan Upah Kerja Lembur (online). (Tidak diterbitkan), https://www.scribd.com/doc/131149015/KEPMEN-102-MEN-VI-2004, accessed on August 03, 2024
6. Peraturan Presiden Nomor 70 Tahun 2012 Tentang Pengadaan Barang dan Jasa (online). (Tidak diterbitkan), https://jdih.lkpp.go.id/regulation/peraturan-presiden/peraturan-presiden-nomor-70-tahun-2012 accessed on May 12, 2024
7. Peraturan Presiden (PERPRES) Nomor 12 Tahun 2018 Tentang Pengadaaan Barang/Jasa Pemerintah (online). (Tidak diterbitkan), https://jdih.lkpp.go.id/regulation/peraturan-presiden/peraturan-presiden-nomor-12-tahun-2021, accessed on May 14, 2024
8. Perhitungan Denda Keterlambatan Pekerjaan menurut PERPRES Nomor 16 Tahun 2018 (online). (Tidak diterbitkan), https://fakpi.org/2018/07/02/denda-keterlambatan-pekerjaan-berdasarkan-perpres-nomor-16-tahun-2018/ accessed May 12, 2024
9. Saputra Roni Gustian. 2023. Evaluasi Jadwal Pelaksanaan Pekerjaan Pembangunan Jembatan Gantung Ds. Batuah Dengan Penambahan Jam Kerja Dan Alat Kerja Menggunakan Metode Crashing. Tugas Akhir. Fakultas Teknik. Universitas Lambung Mangkurat: Banjarbaru