Management Analysis of Solar Power Plant Project 409 Kwp (Case Study at PT. Kideco Jaya Agung in Paser District, East Kalimantan Province)

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ABSTRACT

This research is an analysis of the Solar Power Plant Development Project 409 kWp at PT. Kideco Jaya Agung in Paser Regency, East Kalimantan Province starting from August 2020 to February 2021. This project is implemented by PT. Sumber Multi Energi Penajam (PT. SMEP) with Sub-contractor PT. Sumber Energi Surya Nusantara (PT. SESNA), through an analysis of the entire construction process of the Solar Power Plant project using the Project Management Analysis model tool. The objective is to supervise the implementation of the project so that it is in line with the expected results and on time, which is 6 months in its completion. The problem in this Solar Power Plant Development Project is the application of the PLTS rental or rental system for 13 years by submitting the entire design and budget to PT. SMEP so that PT. Kideco does not have full intervention in the construction of the PLTS. From the research results, it was identified that the project scheduling was still ongoing until February 2021 and in the first 3 years the PLTS had not generated direct profits for the company. Also, because PT. Kideco does not have full intervention resulting in the aesthetics of the design that is not very good but still in accordance with its function.

Keywords
Project management, renewable energy, solar power generation

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Introduction

Energy is one of the main problems faced by almost all countries in the world. This is because energy is one of the main factors for the economic growth of a country. The energy problem becomes increasingly complex when the increasing demand for energy from all countries in the world to support their economic growth actually makes conventional energy reserves less and less. Based on this, it is necessary to develop alternative energy sources that can answer the above challenges. One of them is by utilizing solar energy or solar cell which is a power plant capable of converting sunlight into electric current. Solar energy is actually the most promising source of energy given its sustainable nature and very large amounts. The sun is an energy source that is expected to solve the problem of future energy needs after various conventional energy sources have decreased in number and are not friendly to the environment (Yuliarto, 2021).

Given the potential for solar cells owned by Indonesia, especially the equatorial region, PT. Kideco, which is a company engaged in the mining sector, uses these resources to meet electricity needs in the employee housing area of PT. Kideco. This is in accordance with Permen ESDM No. 39 of 2017 concerning the Implementation of Physical Activities for Utilizing New and Renewable Energy and Energy Conservation and the 2020-2024 National Medium Term Development Plan (RPJMN), the government is targeting the total capacity of adding EBT to 2024 of 9,050.3 megawatts (MW). This number includes details of PLT Hydro 3,909 MW, geothermal energy 1,027 MW, bioenergy 1,295 MW, wind 729 MW, and solar 2,089 MW.

Project work, by many companies, usually determines the time and cost required based on experience. Under certain conditions, a company may have problems in the project completion time due to external factors that cause project implementation. In implementing a project, the use of labor, tools, and materials can deviate from the plan, therefore it must be controlled so that the planned number of workers and materials is not exceeded. The occurrence of construction that is not by the plan needs attention, for example, delays in physical implementation caused by several factors such as a limited number of workers, human resource capacity, natural factors, material provision, managerial ability, and limited capital.

Expenditures and work performance must be monitored so that deviations from the plan can be identified and addressed as early as possible and the need for project completion can be taken into account. In the implementation of the Solar Energy development project in Paser Regency, East Kalimantan (Kaltim), the use of resources, be it labor, tools and materials, went well, it's just because of PT. Kideco does not have full intervention in the PLTS construction, so even though the project runs smoothly and on time, the design results from the aesthetic side are not very good. So, we need a scientific and intensive method of resource management called project management. The project management that will be applied to this project is intended so that the resources that will be used do not exceed the budget. In this study, it will be seen how to manage resources to provide maximum benefits for the implementation of the Solar Power Plant Development project in Paser Regency, East Kalimantan Province.

The problem formulations in this study are as follows: Does project management affect the cost of work; Does Project Management affect the completion time of work and; Does the Project Management affect the work results.

Literature Review

Project activities are temporary activities that take place in a limited period, with certain resources and are intended to carry out tasks whose goals and objectives have been clearly outlined (Soeharto, 1997). In the process of achieving the final results of the project activities, limits have been determined, namely the number of costs (budget) allocated, the schedule and the quality that must be met. The three constraints are known as the triple constrain.

Project Management

Project management according to Husen (2009) is the application of knowledge, expertise and skills, the best technical way and with limited resources, to achieve predetermined goals and objectives to get optimal results in terms of cost performance, quality and time and work safety.

Project Cost

The cost of a construction project (which includes fixed capital) can be divided into two, namely: Direct cost which consists of materials/materials, labor wages/man power, and equipment/equipments cost. Indirect cost which consists of overhead, contingencies, and profit (Sutjipto et al., 1985).

Project Scheduling

Scheduling determines when activities are started, postponed and completed, so that financing and resource use will be timed according to specified needs. All activities in a project are then linked based on logical relationships, thus forming a network diagram that contains the trajectories of events and activities. At this time the commonly used scheduling techniques are as follows Bar Chart with S curve and Cost Analysis.

Accounting Analysis

Accounting can be defined as a process of recording, classifying, summarizing, reporting and analyzing financial data from an organization. Recording and classification activities are processes that are carried out routinely and repeatedly every time a financial transaction occurs.

Cost Control

Control is a systematic effort to determine standards by planning objectives, planning information systems, comparing implementation with standards, analyzing possible deviations between implementation and standards, then taking necessary corrective actions so that resources are used effectively and efficiently to achieve goals (Soeharto, 1997).

Control of Financing

What is meant by financing control here has not cost control to reduce implementation costs, but rather a spending policy through efforts so that the actual costs incurred are following the implementation needs and are not excessive (over stock) and limit the activities to a minimum. cannot yet be billed the payment.

Control of Financial Receipts

Referred to as revenue control is an effort so that revenue realization by the schedule or even if possible ahead of schedule.

Cost Variance Analysis

Analysis of cost variants is a method for controlling costs and schedules for construction activities, where this method compares the actual costs with the costs incurred against the budget.

Working Capital Sector

A company always needs working capital to meet its needs, for example to pay employee salaries. The existence of sufficient working capital is very important for a company, because with sufficient working capital it will allow the company to operate most economically and the company will not experience difficulties or face the dangers that arise due to financial crisis or chaos.

Liquidity Analysis

What is meant by project liquidity control is an effort to regulate the schedule for receiving and disbursing cash in cash during the process of implementing a project, so that loan funds can be properly controlled. Another definition is the ability of a person or company to meet obligations or debts that must be paid immediately with current assets. Liquidity is measured by the ratio of current assets divided by current liabilities. Companies that have healthy liquidity at least have a current ratio of 100%. A measure of the company's liquidity that more describes the level of company liquidity is indicated by the ratio of cash (cash to current liabilities). This analysis can be formulated as follows.

Current Ratio = Short Term Debt divide of Current Assets

Methodology

The object of this research is the Solar Power Plant Development Project located in Paser Regency, East Kalimantan Province. The selection of this project as an object of research is based on the fact that the project has the characteristics of complex activities and has a long implementation period, so it is interesting to discuss, especially regarding project management. For this, the data used includes:
Primary data is: Labor costs, material costs and equipment rental costs; Monthly Project Report; and Project Financial Report.
Secondary Data is: Project Plan Drawing; Budget plan; and Time Schedule.

Data Analysis

In this stage, all data that has been collected will be studied in depth to obtain certain results or conclusions. To make it easier to analyze the problem, cost control analysis techniques are used which consist of: Control of Financing; Control of Reception; Cost Variance Analysis; and Liquidity Analysis.

The results obtained from the analysis used will later be concluded whether the management that has been implemented in the management of the resources used has provided maximum benefits or not.
Accounting Analysis includes: Journal; Ledgers; Trial Balance; Profit / Loss Statement; Report on Changes in Capital; and Balance Sheet.
Analysis of Variance includes: ACWP; BCWS; and BCWP
Liquidity Analysis includes: Control of Revenue; Control of Financing; and Current Ratio

Results and Discussion

Project Acceptance

The plan for receiving the Solar Power Plant Construction project at PT. Kideco Jaya Agung in Paser Regency, East Kalimantan Province is as follows.

a. Cash advance amounting to 13%, after the contract agreement signed
b. Termijn I of 27%, after achievement reaches 4 0%
c. Termijn II amounted to 40%, after the achievement of reaching 80%
d. Termijn III amounted to 20%, after the achievement of reaching 100%

Table 1. Acceptance plan

No.	Description	Termijn I	Termijn II	Termijn III
1	Capital	2,000,160,466.02		
2	Down Payment 13%	963,040,224.38		
3	Achievement (%)	0		
4	% Of acceptance	27%	40%	20%
5	Reception	2,963,200,690.40	2,963,200,690.40	1,481,600,345.20
6	Cumulative acceptance	2,963,200,690.40	5,926,401,380.80	7,408,001,726.00

* termijn direct liquid

Accounting Analysis

To obtain data on the cost budget for materials, wages, and tools, a balance sheet is used. Reporting is done every month, where every transaction that occurs is recorded in a journal which will then be posted to the ledger. After all the transactions that occur are posted or transferred to the general ledger, a financial report will be created, consisting of an income statement, a report on changes in capital and a final balance sheet. All transactions that occur during the Solar Power Plant Development project at PT. Kideco Jaya Agung in Paser Regency, East Kalimantan Province is recorded in a journal until the final balance is obtained for each month. The final balance for each month of the project financial report is as follows.

1. At the beginning of August 2020, the company's cash was IDR 2,963,200,690.40 with a company capital of IDR 2,000,160,466.02 and a DP of 13% of IDR 963,040,224.38.
2. At the end of August 2020, the company's cash was IDR 2,695,668,116.07 with accounts receivable of IDR 267,532,574.33 and capital of IDR 2,963,200,690.40.
3. At the end of September 2020, the company's cash was IDR 2,340,081,563.89 with accounts receivable of IDR 355,586,552.18 and capital of IDR 2,695,668,116.07.
4. At the end of October 2020, the company's cash was IDR 4,983,037,673.27 with accounts receivable of IDR 320,244,581.01 and capital of IDR 5,303,282,254.29.
5. At the end of November 2020, the company's cash was IDR 3,607,094,915.73 with accounts receivable of IDR 1,375,942,757.54 and capital of IDR 4,983,037,673.27.
6. At the end of December 2020 cash of the company was IDR 1,169,754,586.14 with accounts receivable of IDR 3,918,940,674.79 and capital of IDR 5,088,695,260.93.
7. At the beginning of January 2021, the company's cash was IDR 901,181,928.37 with accounts receivable of the company IDR 268,572,657.78 and capital of IDR 1,169,75,586.14.
8. At the beginning of January, there was also a profit of IDR 643,531,628.34.

In implementing the Solar Power Plant Development project at PT. Kideco Jaya Agung in Paser Regency, East Kalimantan Province, the use of resources, be it labor, tools and materials, goes according to need. The number of workers needed to achieve production is following the number of workers in the field, as well as the materials required, which have a match in the delivery process. This can facilitate the implementation of the completion of the work so that it will have an impact on the acceleration of project completion.

The project management that will be applied to this project is intended so that the resources to be used do not exceed the budget and are even smaller than the planned budget. In this study, it will be seen how to manage resources to provide maximum benefits for the implementation of the Solar Power Plant Development project at PT. Kideco Jaya Agung in Paser Regency, East Kalimantan Province.

Analysis of Cost Variance

Analysis of cost variance here uses several indicators, namely ACWP, BCWP, and BCWS. The indicators at the time of reporting are as follows.

Table 2. ACWP data for solar power plant development project

No.	Month	Job Load (%)	Employment Cumulative (%)	Budget Per Month (Rp)	Cumulative Per Month (USD)
1	Aug	3.97%	3.97%	267,532,574.33	267,532,574.33
2	Sept	5.27%	9.24%	355,586,552.18	623,119,126.51
3	Oct	4.75%	13.99%	320,244,581.01	943,363,707.53
4	Nov	20.41%	34.40%	1,375,942,757.54	2,319,306,465.07
5	Dec	58.13%	92.54%	3,918,940,674.79	6,238,247,139.86
6	Jan	3.98%	96.52%	268,572,657.78	6,506,819,797.63
7	Feb	0.00%	96.52%	N/A	6,506,819,797.63
Total		96.52%		6,506,819,797.63	

Source: Financial Statements (Processed)

Table 3. BCWS data for solar power plant construction project

No.	Month	Job Load (%)	Employment Cumulative (%)	Budget Per Month (Rp)	Cumulative Per Month (USD)
1	Aug	2.15%	2.15%	158,919,275.12	158,919,275.12
2	Sept	5.81%	7.95%	430,078,595.44	588,997,870.56
3	Oct	5.13%	13.09%	380,350,379.53	969,348,250.09
4	Nov	14.24%	27.32%	1,054,713,123.31	2,024,061,373.41
5	Dec	43.57%	70.89%	3,227,471,050.15	5,251,532,423.56
6	Jan	28.95%	99.84%	2,144,616,499.68	7,396,148,923.24
7	Feb	0.16%	100.00%	11,852,802.76	7,408,001,726
Total		100%		7,408,001,726	

Source: Financial Statements (Processed)

Table 4. BCWP data for solar power plant construction project

No.	Month	Job Load (%)	Employment Cumulative (%)	Budget Per Month (Rp)	Cumulative Per Month (USD)
1	Aug	3.97%	3.97%	293,991,839.93	293,991,839.93
2	Sept	5.27%	9.24%	390,754,452.95	684,746,292.87
3	Oct	4.75%	13.99%	351,917,121.99	1,036,663,414.87
4	Nov	20.41%	34.40%	1,512,025,008.29	2,548,688,423.16
5	Des	58.13%	92.54%	4,306,528,214.05	6,855,216,637.21
6	Jan	3.98%	96.52%	295,134,788.76	7,150,351,425.97
7	Feb	0.00%	96.52%	N/A	7,150,351,425.97
Total		96.52%		7,150,351,425.97	

Source: Financial Statements (Processed)

Cost Variance (CV) and Schedule Variance (SV)

Cost variance and time variant show how much the cost and time of implementation exceeds the predetermined budget and plan.

Table 5. Value of Cost Variance (CV) and Schedule Variant (SV)

No.	Month	ACWP	BCWP	BCWS	CV (BCWP-ACWP)	SV (BCWP - BCWS)
1	Aug	267,532,574.33	293,991,839.93	158,919,275.12	26,459,265.59	135,072,564.80
2	Sept	355,586,552.18	390,754,452.95	430,078,595.44	35,167,900.77	- 39,324,142.50
3	Oct	320,244,581.01	351,917,121.99	380,350,379.53	31,672,540.98	- 28,433,257.53
4	Nov	1,375,942,757.54	1,512,025,008.29	1,054,713,123.31	136,082,250.75	457,311,884.97
5	Dec	1,375,942,757.54	4,306,528,214.05	3,227,471,050.15	387,587,539.26	1,079,057,163.90

6	Jan	268,572,657.78	295,134,788.76	2,144,616,499.68	26,562,130.99	- 1,849,481,710.91
7	Feb	N/A	N/A	11,852,802.76	N/A	- 11,852,802.76

Source: Financial Statements (Processed)

CPI and SPI

Cost and schedule performance index is a description of the performance of the project.

Table 6. Value of Cost Performance Index (CPI) and Schedule Performance Index (SPI)

No.	Month	ACWP	BCWP	BCWS	CPI (BCWP/ACWP)	SPI (BCWP/BCWS)
1	Aug	220,493,879.94	293,991,839.93	158,919,275.12	1,10	1,85
2	Sept	293,065,839.71	390,754,452.95	430,078,595.44	1,10	0,91
3	Oct	263,937,841.50	351,917,121.99	380,350,379.53	1,10	0,93
4	Nov	1,134,018,756.22	1,512,025,008.29	1,054,713,123.31	1,10	1,43
5	Dec	3,229,896,160.54	4,306,528,214.05	3,227,471,050.15	1,10	1,33
6	Jan	221,351,091.57	295,134,788.76	2,144,616,499.68	1,10	0,14
7	Feb	N/A	N/A	11,852,802.76	N/A	N/A

Source: Financial Statements (Processed)

Table 7. Recapitulation of the analysis of the results of each report

No.	Month	ETC (Rp)	EAC (Rp)	ETS (Month)	EAS (Month)
1	Aug	- 122,916,033.97	144,616,540.36	2,84	3,84
2	Sept	35,784,969.67	391,371,521.85	4,68	6,68
3	Oct	25,874,264.36	346,118,845.37	3,51	6,51
4	Nov	- 416,153,815.33	959,788,942.22	1,57	5,57
5	Dec	- 981,942,019.15	2,936,998,655.64	0,94	5,94
6	Jan	1,683,028,356.93	1,951,601,014.71	7,27	12,52
7	Feb	N/A	N/A	N/A	N/A

Source: Financial Statements (Processed)

Liquidity Analysis

Liquidity is measured by the ratio of current assets divided by current liabilities. Good project liquidity at least has a current ratio greater than one. The results of the liquidity analysis each month are Table 8.

Table 8. Summary of results of analysis of liquidity each month

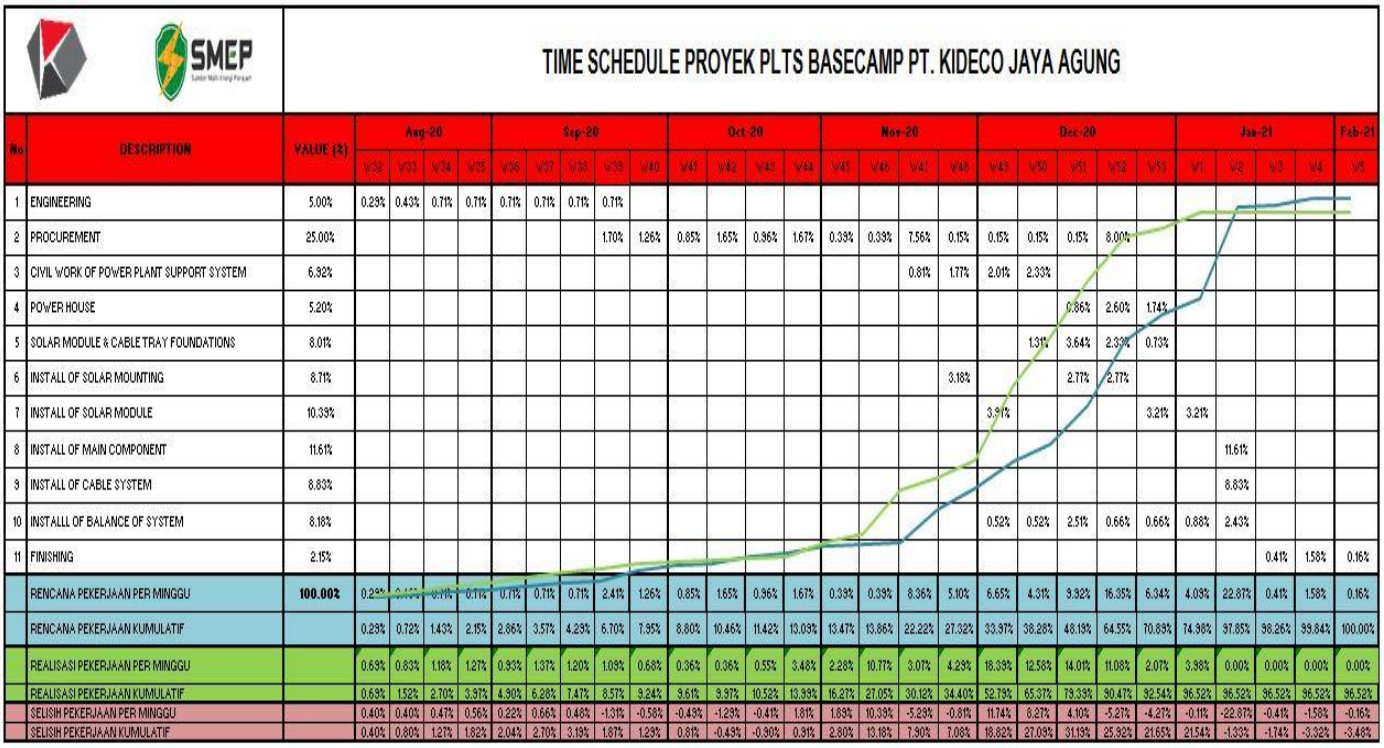
No.	Month	Current Assets	Current Liabilities	Current Ratio	Liquidity
1	Aug	2,963,200,690.40	267,532,574.33	11,08 : 1	Good
2	Sept	2,695,668,116.07	355,586,552.18	7,58 : 1	Good
3	Oct	2,340,081,563.89	320,244,581.01	7,31 : 1	Good
4	Nov	4,983,037,673.27	1,375,942,757.54	3,62 : 1	Good
5	Des	3,607,094,915.73	3,918,940,674.79	0,92 : 1	Not so good
6	Jan	1,169,754,586.14	268,572,657.78	4,36 : 1	Good

Source: Financial Statements (Processed)

Working Capital Sector

Figure 1. Field of working capital

From the graph of the working capital sector above, it can be explained that from the beginning of August 2020 to January 2021 overall financing is smaller than revenue. In December 2020, the current ratio of the company was below 1.0 times, so its ability to pay off debts was still questionable, but this was due to the acceleration of work in that month according to the following S-curve figure.



No	DESCRIPTION	VALUE (%)	Aug-20				Sep-20					Oct-20				Nov-20				Dec-20					Jan-21				Feb-21
			W32	W33	W34	W35	W36	W37	W38	W39	W40	W41	W42	W43	W44	W45	W46	W47	W48	W49	W50	W51	W52	W53	W1	W2	W3	W4	W5
1	ENGINEERING	5.00%	0.29%	0.43%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%																			
2	PROCUREMENT	25.00%								1.70%	1.26%	0.85%	1.65%	0.96%	1.67%	0.39%	0.39%	7.56%	0.15%	0.15%	0.15%	0.15%	8.00%						
3	CIVIL WORK OF POWER PLANT SUPPORT SYSTEM	6.92%																0.81%	1.77%	2.01%	2.33%								
4	POWER HOUSE	5.20%																				0.86%	2.60%	1.74%					
5	SOLAR MODULE & CABLE TRAY FOUNDATIONS	8.01%																			1.31%	3.64%	2.33%	0.73%					
6	INSTALL OF SOLAR MOUNTING	8.71%																	3.18%			2.77%	2.77%						
7	INSTALL OF SOLAR MODULE	10.33%																		3.31%				3.21%	3.21%				
8	INSTALL OF MAIN COMPONENT	11.61%																								11.61%			
9	INSTALL OF CABLE SYSTEM	8.83%																								8.83%			
10	INSTALLL OF BALANCE OF SYSTEM	8.18%																		0.52%	0.52%	2.51%	0.66%	0.66%	0.88%	2.43%			
11	FINISHING	2.15%																									0.41%	1.58%	0.16%
	RENCANA PEKERJAAN PER MINGGU	100.00%	0.29%	0.43%	0.71%	0.71%	0.71%	0.71%	0.71%	2.41%	1.26%	0.85%	1.65%	0.96%	1.67%	0.39%	0.39%	8.36%	5.10%	6.65%	4.31%	9.92%	16.35%	6.34%	4.09%	22.87%	0.41%	1.58%	0.16%
	RENCANA PEKERJAAN KUMULATIF		0.29%	0.72%	1.43%	2.15%	2.86%	3.57%	4.28%	6.70%	7.95%	8.80%	10.46%	11.42%	13.09%	13.47%	13.86%	22.22%	27.32%	33.97%	38.28%	48.19%	64.55%	70.83%	74.96%	97.85%	98.26%	99.84%	100.00%
	REALISASI PEKERJAAN PER MINGGU		0.69%	0.83%	1.18%	1.27%	0.93%	1.37%	1.20%	1.09%	0.68%	0.36%	0.36%	0.55%	3.48%	2.28%	10.77%	3.07%	4.23%	18.39%	12.58%	14.01%	11.08%	2.07%	3.98%	0.00%	0.00%	0.00%	0.00%
	REALISASI PEKERJAAN KUMULATIF		0.69%	1.52%	2.70%	3.97%	4.90%	6.28%	7.47%	8.57%	9.24%	9.61%	9.97%	10.52%	13.99%	16.27%	27.05%	30.12%	34.40%	52.79%	65.37%	79.39%	90.47%	92.54%	96.52%	96.52%	96.52%	96.52%	96.52%
	SELISIH PEKERJAAN PER MINGGU		0.40%	0.40%	0.47%	0.56%	0.22%	0.66%	0.48%	-1.31%	-0.58%	-0.43%	-1.29%	-0.41%	1.81%	1.89%	10.39%	-5.29%	-0.81%	11.74%	8.27%	4.10%	-5.27%	-4.27%	-0.11%	-22.87%	-0.41%	-1.58%	-0.16%
	SELISIH PEKERJAAN KUMULATIF		0.40%	0.80%	1.27%	1.82%	2.04%	2.70%	3.19%	1.87%	1.29%	0.81%	-0.43%	-0.90%	0.91%	2.80%	13.18%	7.90%	7.08%	18.82%	27.09%	31.19%	25.92%	21.65%	21.54%	-1.33%	-1.74%	-3.32%	-3.48%

Figure 2. S-Curve

Conclusion

Conclusion

Based on the results of the analysis previously discussed, the following conclusions can be drawn.

a. Management

Management of resources at the Solar Power Plant Development Project at PT. Kideco Jaya Agung in Paser Regency, East Kalimantan Province which is implemented by PT. Sumber Multi Energi Penajam (PT. SMEP) with sub-contractor PT. Sumber Energi Surya Nusantara (PT. SESNA) for 6 (six) months is maximal. This is due to the control of revenue and control of financing that is already right, meaning that the resources used do not exceed the budget.

b. Based on the Cost Variance Analysis, the following results were obtained.

- From the aspect Costs

In the reporting month of August 2020 until January 2021, cost variance (CV) showed a positive number, which indicates that the project expenditure is less than the budget (cost underrun), which is evidenced by the actual cost (ACWP) issued less than the budget for completed work (BCWP). Based on the trends or conditions that occurred at the time of reporting that did not change, it can be seen that the total costs until the beginning of January 2021 are less than the current project budget. The profit obtained is 9% of the project cost budget.

- From the aspect of Time

At reporting in August and September 2020 schedule (SV) showed a positive number, which means the implementation of the work done ahead of schedule. Based on the trends or conditions that occurred at the time of reporting that did not change, it could be seen that the project implementation was by the planned schedule.

- From the calculation of the project liquidity ratio each month, the results of the project liquidity from the end of August to the end of November 2020 are very good. Meanwhile, project liquidity until the end of December 2020 was not good, due to accelerated work. Furthermore, project liquidity until early January 2021 is very good.

Suggestions

The company recommends that in implementing the Solar Power Plant Construction project at PT. Kideco Jaya Agung in Paser Regency, East Kalimantan Province, is expected to provide better design and aesthetics, so that the results of the work will be better.

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References

[1] Abrar Husen, 2011, Buku Manajemen Proyek: Perencanaan, Penjadwalan & Pengendalian Proyek. Yogyakarta: Andi Offset.

[2] Adnyana, I. B. P., Sudarsana, D. K., Swastika, I. N., Yana, A. A. G. A. 2003. Buku Ajar Manajemen Proyek Konstruksi, Universitas Udayana, Denpasar.

[3] Armini, Ari. 2006. Pengendalian Biaya Dan Waktu Pelaksanaan Proyek Villa Sentosa Dengan Konsep Nilai Hasil. Tugas Akhir, Program Studi Teknik Sipil Universitas Udayana, Denpasar.

[4] Asiyanto. 2005. Construction Project Cost Management, Pradnya Paramita, Jakarta.

[5] Dipohusodo, I. 1996. Manajemem Proyek dan Konstruksi. Kanisius, Yogyakarta.

[6] Hafnidar A. Rani, 2016. "Manajemen Proyek Konstruksi". Publisher: Deepublish (CV. Budi Utama).

[7] Husen, A. 2009. "Manajemen Proyek", Yogyakarta.

[8] Laporan Keuangan mulai Agustus 2020 s/d bulan Januari 2021 oleh PT. Sumber Energi Surya Nusantara.

[9] Permen ESDM No. 39 Tahun 2017 tentang Pelaksanaan Kegiatan Fisik Pemanfaatan Energi Baru Terbarukan serta Konservasi Energi.

[10] Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020-2024.

[11] Riyanto, Bambang. 2014. Dasar Dasar Pembelajaran Perusahaan, BPFE, Yogyakarta.

[12] Soeharto, I., 1997. Manajemen Proyek dari Konseptual Sampai Operasional, Erlangga, Jakarta.

[13] Sutjipto, R. Nugroho, P., Natan, I.,1985. Manajemen Proyek Konstruksi 1. Kartika Yudha, Surabaya.

[14] Warsika, MM., Putu Dharma. 2005. Akuntansi Biaya Project. Program Studi Teknik Sipil Universitas Udayana, Denpasar.

[15] Wulfram I. Ervianto. 2005. "Buku Manajemen Proyek Konstruksi". Yogyakarta: Andi Offset.

[16] www.esdm.go.id.