
RECONCILIATION OF MINING PLANNING AND REALIZATION AT PIT 4 PT ADIMITRA BARATAMA NUSANTARA SUBCONTRACTOR

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ABSTRACT

PT. RPP Contractors Indonesia implements open-pit mining with open pit mining methods. Which has a coal mining production target in June 2021 of 111,800 tons of coal and overburden stripping of 1,596,278 BCM. However, mining realization often experiences discrepancies every month, therefore research is needed to analyze the differences in mining planning and realization, the factors that cause differences, and efforts that can be made to minimize the mismatch of mining planning to the realization of mining. Reconciliation is finding a way to create two different ideas, facts, etc. The research method conducted is to match the mining planning in June 2021 with the actual mining in June 2021 to get the percentage of the mining match. From the results of the study, it is known that in June 2021 the achievement of mining according to planning is 111,800 tons of coal and 1,596,278 BCM overburden. And from observations, the causes of the difference between planning and realization in the field are the number of inappropriate fleets, the productivity of unsuitable tools, and less than optimal representation. Therefore, efforts are needed to minimize these discrepancies by increasing effective working time and increasing supervision.

Keyword: Reconciliation, Mining planning, mining realization.

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INTRODUCTION

To maximize the number of reserves owned, mining planning is made starting from long-term planning commonly called Life of Mine plan (LOM), annual plan, monthly plan, weekly plan, daily plan, and per shift plan. Mine planning is the most important part of mining activity to ensure mining operations will be carried out in coordination and in accordance with the planned targets ([Hustrulid, Kuchta, & Martin, 2013](#)).

But in mining activities there is often a mismatch between the plan and the actual conditions in the field, this discrepancy is found after accuracy is carried out ([Wicker, 1969](#)). The use of the software is very helpful in planning mining. However, on this occasion, it is also used to identify between the mining plan and the actual conditions. Frequent discrepancies include overcut (excess digging based on RL), undercut (lack of digging), and overstripping (stripping exceeds the specified position target) ([Ibrahim, 2015](#)).

Reconciliation means the act of resolving differences where two or more things are done that have a relationship with each other which if found differences will be made settlement (Dictionary of Indonesian). According to ([Somers, Howlett, MacFarlane, & Forsyth, 2013](#)), reconciliation is defined

as 'the process of finding a way to make two different ideas, facts, etc. exist or true at the same time'. In terms of the mining process, it refers to the comparison of sizes and estimates along the value chain, and at different points in time, to track and optimize metal recovery.

The purpose of this research is to find out the discrepancy of mining planning based on design with actual realization in the field, factors that affect the discrepancy, and efforts that can be made to minimize the discrepancy.

METHOD

For data collection carried out, there are two ways, namely by observing directly in the field to see directly the actual conditions in the field called primary data, and data that has been processed by companies called secondary data. For observation data in the form of fleet numbers, cycle time digging tools fit, and clock resistance ([Heyer, Donnelly, Foster, & Mcdiarmid, 2014](#)). And for data that has been processed by the company in the form of mining planning, availability of loading digging tools, and mining progress maps.

For data processing carried out after the data is collected, namely overlaying on the mine progress map with the mine planning map, then calculating the volume of mining planning achievements, and calculating the productivity of tools to determine the mismatch factors.

RESULT AND DISCUSION

A. Mining achievement based on mine plan design in June 2021 Pit 4 PT. ABN subcontractor PT. RCI

1. Mining plan based on mine plan design.

The mine plan design provides information on mining direction, mining elevation, mining activity priorities, and other important information (Figure 4.5). The mine plan design of PT RPP Contractors Indonesia is compiled and planned by the Engineering Department every month ([Jeronimo, Rap, & Vos, 2015](#)). The preparation of the mine plan design coal expose is described in one monthly map and scheduled in weekly ([COSTA, Zingano, & KOPPE, 2000](#)). PT RPP Contractors Indonesia in June 2021 planned to mine 19 seam coal exposes with a total ob of 1,526,647.37 BCM and a total coal of 119,848.13 tons.

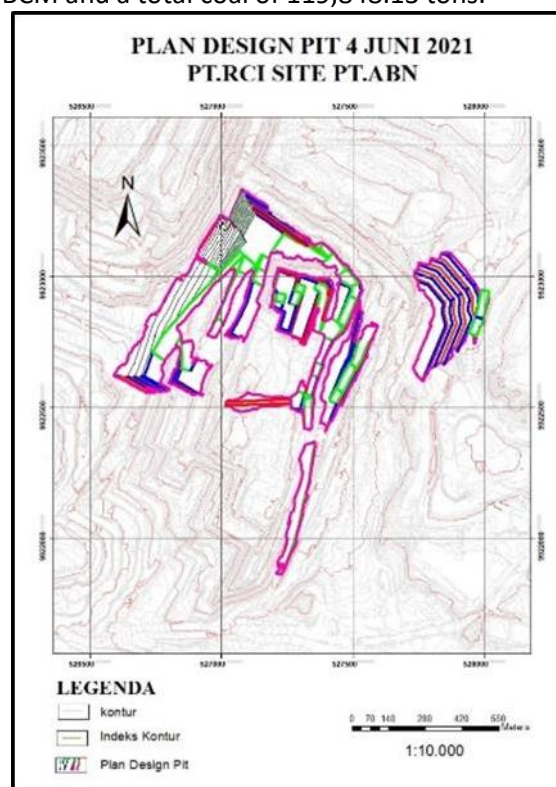


Figure 1. Plan design pit June 4, 2021

2. Actual mining based on mine plan design

To find out whether the excavation carried out in June 2021 is in accordance with the mining limits or not, an overlay is needed between the boundary mine plan design and the mine progress boundary in June 2021. The overlay process was carried out in this study using Minescape 5.7 software (Guo, Yuan, Shen, Qu, & Xue, 2012). The results of the overlay between the mine plan design and the progress of the mine show that there is an area that is mining that is not as planned / outside the mine boundary (Sonter, Dade, Watson, & Valenta, 2020).

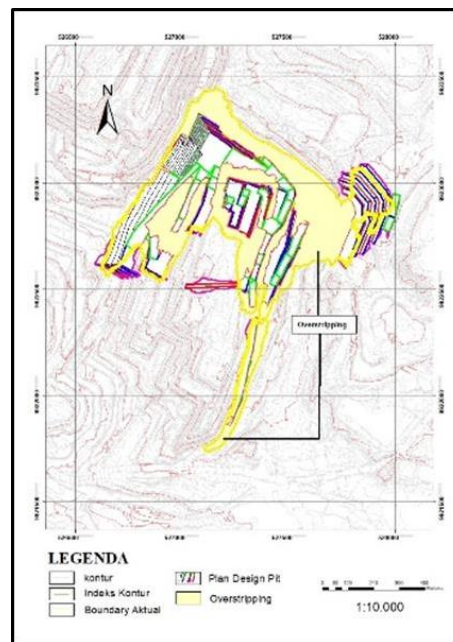


Figure 2.Overlay Plan and actual design pit June 4, 2021

The area restricted to pink is the boundary mine plan design in June 2021 while the yellow line is the boundary of the mine's progress (Khan et al., 2021). Some areas that are light yellow that cross the excavation boundary or exceed the planned mining boundary mine design plan are called horizontal overstripping or overcut.

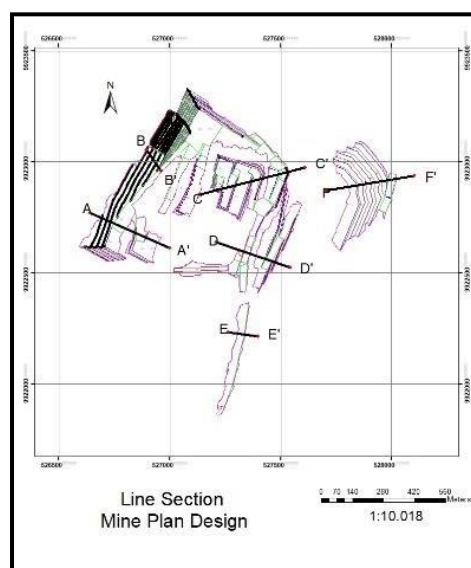


Figure 3. Line Section Mineplan Design Pit 4 PT. RCI

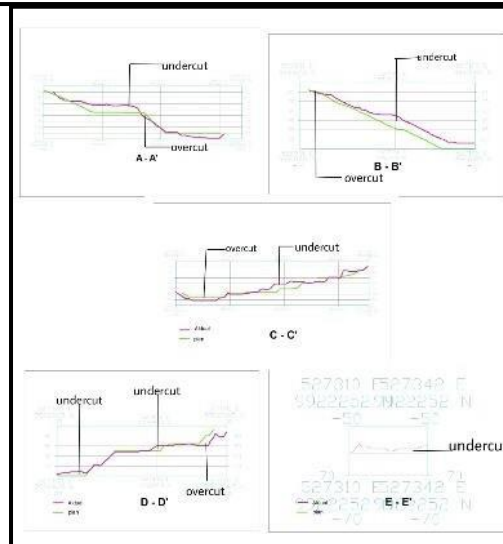


Figure 4. Line Section Pit 4 PT. RCI

In addition to *overstripping*, to see if the realization of the excavation is in accordance with the *level* that has been planned or not, it can be seen using the *line section* (Figure 4.8) of the mining site (Pettapiece, Ag, & Dell, 1996). *Line sections* are made to find out areas that are less than the elevation plan (*undercut*) and excavations that exceed the elevation plan (*overcut*) as well as excavations that are in accordance with the elevation plan (*in of plan*).

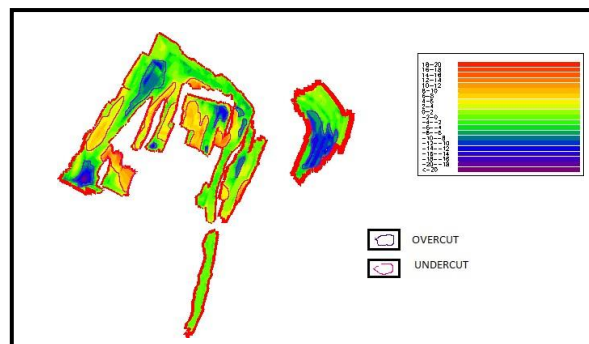


Figure 5. Rainbow Countour Overlay Plan and Actual Pit 4 PT. RCI

For *undercut* and *overcut* areas can also be seen from Figure 4.9, blue-marshaded areas are areas that are less than the elevation plan (*undercut*) and the yellow and orange areas are excavation areas that exceed the elevation plan (*overcut*).

Table 1. Percentage of Planning and actual mining

volume	Material			
	Tanah (BCM)	%	Batubara (ton)	%
1. Rencana berdasarkan	1.788.000.00	100,00%	136.326.90	100,00%
2. Aktual	1.673.432.5	93,59%	118,634,04	87,02%
3. ketidaksesuaian				
a. Over-Stripping				
b. Overcut				
c. Undercut				
4. Progres in Plan				

Volume	Material			
	Tanah (BCM)	%	Batubara (Ton)	%
1. Rencana Berdasarkan Design	1.788.000,00	100,00%	136.326,90	100,00%
2. Aktual	1.673.432,5	93,59%	118.634,04	87,02%
3. Ketidaksesuaian				
a. Over-Stripping	477.809,7	26,76%	25.942,32	21,87%
b. Overcut	533.912,8	31,90%	35.844,37	30,21%
c. Undercut	1.126.290	62,99%	79.478,65	66,99%
4. Progress in Plan	661.710	37,01%	56.847,35	33,01%

Hasil perhitungan volume yaitu pengupasan *overburden* sebesar 1.673.432,5 BCM atau 93,59% yang terdiri dari pengupasan yang masih di area tertambang (*in of plan*) sebesar 661.710 BCM, pengupasan yang melebihi rencana elevasi (*overcut*) sebesar 533.912,8 BCM dan pengupasan yang kurang dari rencana elevasi (*undercut*) sebesar 1.126.290 BCM. Sedangkan untuk penggalian batubara sebesar 118.634,04 ton atau 87,02% yang terdiri dari penggalian yang masih di area tertambang (*in of plan*) sebesar 56.847,35 ton, penggalian yang melebihi rencana elevasi (*overcut*) sebesar 35.844,37 ton dan penggalian yang kurang dari rencana elevasi (*undercut*) sebesar 79.478,65 ton (Tabel 1)

Dari pihak owner memberi persentasi minimum ketidaktercapaian adalah 90% dan untuk persentasi dari aktual batubara yaitu 87,02%. maka dari itu, pada perencanaan juni 2021 terjadi ketidaktercapaian.

Faktor-faktor yang mempengaruhi ketidaksesuaian :

1. Produktivitas alat gali muat

Untuk rata-rata dari ketercapaian produktivitas alat gali muat adalah 95%. Hal tersebut dapat terjadi dikarenakan ada beberapa alat gali muat yang *breakdown* dalam waktu yang cukup lama dan pada beberapa waktu terjadi kekurangan operator yang menyebabkan alat gali muat menjadi *standby* (Sosantri, Yulhendra, & Prabowo, 2018).

2. Jumlah *fleet* penambangan

Dikarenakan beberapa alat gali muat yang *breakdown* dan *standby*, menyebabkan *fleet* penambangan yang seharusnya menjadi kurang dari perencanaan penambangan (Rija & Anaperta, 2020).

3. Pengawasan

Pengawasan sangat mempengaruhi aktual penambangan dilapangan, penambangan sering kali terjadi *overstripping* dan *overcut* terutama di malam hari (GUSTONI, Ibrahim, & Bochori, 2020). Hal tersebut terjadi dikarenakan kurangnya pencahayaan pada malam hari.

Upaya yang dapat dilakukan untuk Meminimalisir Ketidaksesuaian Perencanaan penambangan untuk Bulan Berikutnya.

1. Meningkatkan Waktu Kerja Efektif (EWH)

Waktu kerja efektif alat gali muat harus diperhitungkan dengan baik terutama dalam mempertimbangkan jumlah waktu yang digunakan untuk perbaikan alat gali muat (*repairs hours*) dan minimalisir waktu hambatan kerja. Perbaikan waktu kerja efektif untuk meningkatkan produksi di bulan selanjutnya dapat dilakukan dengan mengalokasikan waktu hambatan kerja (*loss time production*) terutama *wait for other unit*, tidak adanya operator, dan *standby no job*.

2. Peningkatan pengawasan

Tim pengawas produksi dan *pit control* harus memastikan alat gali muat *coal expose* berada didalam boundary penambangan, agar tidak terjadi *overstripping*. Terutama pada malam hari, dikarenakan kurangnya pencahayaan, untuk mencegah terjadinya *overstripping* dibulan selanjutnya lebih baik menggunakan aplikasi pemetaan seperti *avenza maps*. Selain itu, diperlukan pengecekan berkala pada

elevasi penambangan agar tidak terjadi *overcut* pada area kerja penambangan. Pengecekan bukan berarti harus mengganti patok, cukup memastikan posisi area kerja alat sesuai dengan *design* saja.

3. Penambahan patok penambangan

Diperlukan penambahan patok pada area kerja, agar penambangan sesuai dengan mine plan design yang sudah direncanakan. Penggantian patok juga diperlukan jika sudah tidak relevan antara *mine plan design* dan kemajuan tambang. Dan penambahan patok penambangan bila terjadi pada patok yang hilang. Hal tersebut dapat mempermudah dalam mengontrol area kerja *coal expose* dan merealisasikan perencanaan *coal expose* (Ngarayana, Sutanto, & Darmawati, n.d.).

CONCLUSION

From the various presentations above and the theoretical framework and discussion, some information was obtained about the influence of perception of usability, the ease of digital payment limited to the performance of cashless society of government financial performance, that the perception of digital use of payment has been felt and has begun to increase among the millennial generation, but for transaction applications that connect with state finances are still not visible. Then the perception of digital payment ease is familiar and aplikatif, but it has not been able to touch on the country's financial cashless society.

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