

ABSTRAK

ANALISIS *WORKING GEOMETRY FRONT WASTE* TERHADAP PRODUKTIVITAS ALAT GALI-MUAT DI PT AGINCOURT RESOURCES

Oleh
Muhammad Athariq
NIM: 112210053
(Program Studi Sarjana Teknik Pertambangan)

Produktivitas alat gali-muat *backhoe excavator* Komatsu PC1250 SP-11R pada kegiatan pengupasan *waste* di *Pit* Purnama PT Agincourt Resources (PTAR) belum mencapai target yang ditetapkan, dengan ketercapaian hanya berkisar 65%-80% dari target 400 BCM/jam. Hal ini diindikasikan akibat kondisi *working geometry front* penambangan (tinggi dan lebar) yang belum optimal untuk mendukung kinerja armada yang beroperasi.

Penelitian ini bertujuan untuk merancang *working geometry front* yang ideal, menganalisis pengaruh geometri terhadap produktivitas, serta memberikan target *cycle time* maksimal alat gali-muat untuk mencapai target produksi. Metode penelitian menggunakan pendekatan kuantitatif melalui pengamatan lapangan terhadap dimensi geometri aktual dan waktu edar (*cycle time*) alat. Data diolah menggunakan analisis regresi untuk mengetahui korelasi antara variabel geometri dengan komponen *cycle time* (*waiting time* dan *digging time*) serta faktor pengisian *bucket* (*bucket fill factor*).

Hasil analisis menunjukkan bahwa lebar *front* memiliki korelasi negatif yang sangat kuat ($R^2 = 0,9458$) terhadap *waiting time*, di mana kondisi sempit meningkatkan waktu tunggu rata-rata hingga 38,31 detik. Tinggi *front* memiliki korelasi positif kuat terhadap BFF ($R^2 = 0,5598$) dan korelasi negatif sangat kuat terhadap *digging time* ($R^2 = 0,788$). Penerapan rancangan geometri ideal dengan tinggi 3 m dan lebar 25,5 m diprediksi dapat meningkatkan BFF hingga 91,71%. Berdasarkan simulasi, target produksi 400 BCM/jam dapat dicapai dengan target *cycle time* maksimal sebesar 31,1 detik.

Kata kunci: alat gali-muat, *cycle time*, produktivitas, tambang terbuka, *working geometry front*.

ABSTRACT

ANALYSIS OF WORKING GEOMETRY FRONT WASTE ON THE PRODUCTIVITY OF EXCAVATION-LOADING EQUIPMENT AT PT AGINCOURT RESOURCES

By

Muhammad Athariq

NIM: 112210053

(Mining Engineering Undergraduated Program)

The productivity of the Komatsu PC1250 SP-11R backhoe excavator in waste stripping activities at Pit Purnama, PT Agincourt Resources (PTAR), has not met the set target, achieving only 65%-80% of the 400 BCM/hour target. This is indicated to be caused by the mining working geometry front conditions (height and width) which are not yet optimal to support the performance of the operating fleet.

This research aims to design an ideal working geometry front, analyze the influence of geometry on productivity, and setting maximum target for the excavator's cycle time. The research method employed a quantitative approach through field observations of actual geometric dimensions and equipment cycle times. Data were processed using regression analysis to determine the correlation between geometric variables and cycle time components (waiting time and digging time) and bucket fill factor.

The analysis results show that front width has a very strong negative correlation ($R^2 = 0,9458$) with waiting time, where narrow conditions increase average waiting time up to 38,31 seconds. Front height has a strong positive correlation with BFF ($R^2 = 0,5598$) and a very strong negative correlation with digging time ($R^2 = 0,788$). The implementation of an ideal geometry design with a height of 3 m and a width of 25,5 m is predicted to increase BFF up to 91,71%. Based on simulation, the 400 BCM/hour production target can be achieved by setting a maximum cycle time target of 31,1 seconds

Keywords: cycle time, excavator, open-pit mine, productivity, working geometry front.