ABSTRACT

Coal mining business is now faced with various challenges such as export restrictions policy, an increase in value added products, and the decline in market prices of products. To be able to compete, mining companies are expected to increase productivity and efficiency and make continuous improvements in the production process. In the mining process, the availability of equipment and dump truck unloading tool will determine the sustainability of production that have an impact on productivity and efficiency. The purpose of this study was to optimize the production of coal mining in the context of the efficient use of equipment using the match factor, queues, and linear programming. The research location is in the area of the mining concession contractor PT KTD is in the village of Embalut, District Tenggarong Seberang, Kertanegara Kutai Regency, East Kalimantan in October-November 2015. Unloading equipment used backhoe excavator is 5 units and 32 units of dump trucks. The simulation results match factor generated by the method optimal dump truck needs 25 units, while the queuing method and linear programming as much as 26 units of dump truck. The results of production optimization with linear programming method produced mining productivity of 1,208 BCM of overburden per hour with the optimum cost of $ 0909 / BCM.

Keywords*: excavator, dump truck, match factor, production optimize, queuing theory, linear programming*

ABSTRAK

Bisnis pertambangan batubara saat ini dihadapkan pada berbagai tantangan seperti kebijakan pembatasan ekspor, peningkatan nilai tambah produk, dan penurunan harga pasar produk. Agar mampu bersaing, perusahaan pertambangan dituntut untuk meningkatkan produktivitas dan efisiensi serta melakukan perbaikan yang berkesinambungan dalam proses produksinya. Dalam proses penambangan, ketersediaan peralatan *dump truck* dan alat muat akan menentukan keberlangsungan produksi yang berdampak pada produktivitas dan efisiensi. Tujuan penelitian ini adalah melakukan optimasi produksi pada penambangan batubara dalam rangka efisiensi penggunaan peralatan dengan menggunakan metode *match factor*, antrian, dan *linier programming*. Lokasi penelitian dilakukan di area kerja kontraktor pertambangan konsesi PT KTD yaitu di Desa Embalut, Kecamatan Tenggarong Seberang, Kabupaten Kutai Kertanegara, Kalimantan Timur pada bulan Oktober-November 2015. Alat muat yang digunakan adalah 5 unit *excavator backhoe* dan 32 unit *dump truck*. Hasil simulasi dengan metode *match factor* dihasilkan kebutuhan optimal *dump truck* sebanyak 25 unit, sementara dengan metode antrian dan *linier programming* sebanyak 26 unit alat angkut. Hasil optimasi produksi dengan metode *linear programming* dihasilkan produktivitas penambangan *overburden* sebesar 1.208 BCM per jam dengan biaya optimum sebesar 0.909 USD/BCM.

Kata Kunci: *excavator, dump truck, match factor*, optimasi produksi, teori antrian, *linear programming*