

ABSTRACT

PT. Kaltim Prima Coal (PT. KPC) is an authority holder company in coal exploration and coal mining for 90.960 Ha area located in Sangatta-Bengalon, East Kutai, East of Borneo. PT. Kaltim Prima Coal (PT. KPC) divide its mining operation in three mine operational division that is MOD (Mining Operation Division), CMD (Contract Mine Division) site Sangatta, and CMD (Contract Mine Division) site Bengalon. The research located in pit MOD that consist of three different location, Department Pit Hatari (pit Inul Middle, pit Inul East), Department Pit Bintang (pit Bendili), and Department Pit Jupiter (pit Pinang South). Blasting is required to open or break coal overburden, with maximum of explosive charge per blasting (powder factor/PF) is 0,30 kg/m³.

From observation, blasting result in Mining Operation Division (MOD) was having an excessive powder factor (PF) to maintain blasting quality from fragmentation (percent passing $\geq 80\%$ in size of ≤ 300 mm) and digging time (based on type of excavator). Dept. Pit Bintang was holding the largest contribution in over powder factor, meanwhile Dept. Pit Hatari and Dept. Pit Jupiter was near the powder factor limit. With the result of that, improvement is needed to minimalize the use of explosives, however it might cost its blasting quality. Bottom air deck is one of the other way to reduce PF by replacing bottom side of column charge with air (air deck). The length of air deck is determined by ratio of air deck factor and could be predicted by the value of rock mass ratings (RMR).

Research that had been done in each pit in MOD did not change entire blast geometry, however the only geometry that have been adjusted is changing the bottom part of column charge with 1 meter air deck. Based on the air deck factor (ADF) equation = air deck length (ADL)/original column charge length (OCCL), with the value of OCCL will also become variably along with depth of blasthole. Therefore, the research final result will come as bottom air deck usage recommendation in certain blastholes depth based from air deck factor trial results. Air deck factor (ADF) prediction analysis from rock mass ratings (RMR) in each pit (Inul Middle, Inul East, Bendili, and Pinang South) resulted range value of 0,1 – 0,2 with average powder factor reduction is 4,15%.

Blasting trials in each pit based on fragmentation, digging time, and actual floor elevation has resulted air deck factor recommendation in pit Inul Middle is 0,10 – 0,23, pit Inul East is 0,10 – 0,29, pit Bendili is 0,10 – 0,15, and pit Pinang South is 0,10 – 0,20. Based on air deck recommendations, therefore it resulted recommendation of minimum column charge length which is in pit Inul Middle = 4,2 meter, pit Inul East = 3,5 meter, pit Bendili = 6,5 meter and pit Pinang South = 5,2 meter. Average actual powder factor was thus reduced by 8,23% as compared to non air deck blasting plan.

Keywords : Powder Factor, Air Deck Factor, Column Charge