ABSTRAK

Nama : Muhamad Adit Pramudya
Program Studi : S1 Teknik Pertambangan
Judul : Analisis *Powder Factor* (PF) dan Fragmentasi Hasil Peledakan Pada Penambangan Batu Andesit PT. Nusantara Swadesi Mining Desa Liunggunung Kecamatan Plered Kabupaten Purwakarta Provinsi Jawa Barat

PT. Nusantara Swadesi Mining merupakan perusahaan penambangan batu andesit yang terletak di Desa Liunggunung, Kecamatan Plered, Kabupaten Purwakarta, Provinsi Jawa Barat. Melakukan penambangan secara tambang terbuka dengan metode quarry (*Side Hill Type Quarry*). Tujuan penelitian ini untuk mendapatkan nilai *powder factor* (PF) yang optimal dengan hasil fragmentasi ideal batuan dengan ukuran *boulder* 80 cm maksimal 10% dari hasil peledakan. Metodologi yang digunakan dalam mencari rancangan geometri dengan menggunakan *simulasi trial and error* dan menghitung pengaruh *powder factor* pada fragmentasi dengan regresi linier. Rancangan geometri peledakan usulan dibuat perbandingan 2 metode yaitu R.L Ash dan C.J Konya dengan simulasi *trial and error.* Perhitungan fragmentasi dilakukan dengan 2 cara yaitu secara teoritis dengan persamaan Kuznetsov-Rossin Ramler dan aktual menggunakan *image analysis* Analisa *software split desktop* 4.0. Analisa geometri peledakan berdasarkan data aktual lapangan adalah: Burden (B) = 1,82 m, Spacing (S) = 1,82 m, Kedalaman lubang ledak (H) = 8 m, Diameter lubang ledak = 3, Powder factor (PF) = 0,72 kg/m^3 , Rata rata fragmentasi = 16.84 cm, Persentase Boulder 1 %. Geometri yang usulan pertama yaitu perhitungan R.L Ash dengan rancangan geometri peledakan : (B) = 2.3 m, Spacing (S) = 2.3 m, Kedalaman lubang ledak (H) = 8 m, Diameter lubang ledak = 3 Inchi, Powder factor (PF) = 0,49 kg/m^3 , Rata rata fragmentasi = 25,35 cm, Persentase Boulder 3%. Selanjutnya geometri usulan kedua yaitu perhitungan C.J Konya dengan rancangan geometri peledakan : (B) = 2.4 m, Spacing (S) = 2.4 m, Kedalaman lubang ledak (H) = 8 m, Diameter lubang ledak = 3 Inchi, Powder factor (PF) = 0,47 kg/m^3 , Rata rata fragmentasi = 27,41 cm, Persentase Boulder 8.5 %. Berdasarkan perbandingan geometri peledakan, maka usulan R.L Ash mendapatkan nilai powder factor optimal karena terjadi penurunan nilai PF dari 0.72 kg/m^3 ke 0.49 kg/m^3 serta meningkatkan keseragaman distribusi batuan berukuran 25.35 cm. Berdasarkan pengolahan data regresi linier, hubungan *powder factor* (X) terhadap persentase *boulder* (Y) yaitu Aktual Y = - 82,746X + 64,506 dengan nilai r : 0.93 (Koefisien Korelasi) dan r^2 (Koefisen Determinasi) sebesar 0,859, R.L Ash : Y = - 40,99 x + 25,739 dengan nilai r : 0.91 (Koefisien Korelasi) dan nilai r^2 (Koefisen Determinasi) sebesar 0,8264, dan C.J Konya Y = - 43,923x +27,339, dengan nilai r : 0.90 (Koefisien Korelasi) dan nilai r^2 (Koefisen Determinasi) sebesar 0,8173. Maka korelasi dari *powder factor* terhadap fragmentasi ayakan 80 pada masing masing geometri termasuk kuat.

Kata Kunci : Powder Factor, Geometri, Fragmentasi, Boulder

ABSTRACT

Name : Muhamad Adit Pramudya
Study Program : Bachelor of Mining Engineering
Title : Analysis of Powder Factor (PF) and Fragmentation of Blasting Results in Andesite Stone Mining PT. Nusantara Swadesi Mining, Liunggunung Village, Plered District, Purwakarta Regency, West Java Province

PT. Nusantara Swadesi Mining is an andesite mining company located in Liunggunung Village, Plered District, Purwakarta Regency, West Java Province. Open pit mining system with quarry method (Side Hill Type Quarry). The purpose of this study was to obtain an optimal powder factor (PF) value and ideal rock fragmentation results with a boulder level of 80 cm maximum 10% of the blasting results. The methodology used in finding the relationship between the powder factor effect and fragmentation with linear regression. The proposed blasting geometry design was made by comparing two methods, namely R.L. Ash and C.J. Konya, with trial and error simulations. Fragmentation calculations are carried out in two ways, namely theoretically with the Kuznetsov-Rossin Ramler equation and using desktop split software analysis 4.0. The blasting geometry analysis based on actual field data is: Burden (B) = 1.82 m, Spacing (S) = 1.82 m, Depth of blast hole (H) = 8 m, Diameter of blast hole = 3, Powder factor (PF) = 0.72 kg/m^3, Average fragmentation = 16.84 cm, Boulder percentage 1%. The first proposed geometry is the calculation of R.L. Ash with the design of blasting geometry: (B) = 2.3 m, Spacing (S) = 2.3 m, Depth of blast hole (H) = 8 m, Diameter of blast hole = 3 inches, Powder factor (PF) = 0.49 kg/m^3 , Average fragmentation = 25.35 cm, Boulder percentage 3%. subsequently, the second proposed geometry is the calculation of C.J. Konya with the blasting geometry: (B) = 2.4 m, Spacing (S) = 2.4 m, Depth of blast hole (H) = 8 m Diameter of blast hole = 3 inches, Powder factor (PF) = 0.47 kg/m3; average fragmentation = 27.41 cm, Boulder percentage = 8.5%. Based on the comparison of blasting geometry, the R.L. Ash proposal gets the optimal powder factor value because there is a decrease in PF value from 0.72 kg/m^3 to 0.49 kg/m^3 and an increase in the uniformity of rock distribution measuring 25.35 cm. Based on linear regression data processing, the powder factor (X) relationship to boulder percentage (Y) is Actual Y = - 82.746X + 64.506 with r values: 0.93 (Correlation Coefficient) and r^2 (Determination Coefficient) of 0.859, R.L Ash: Y = - 40.99 x + 25.739 with r values: 0.91 (Correlation Coefficient) and r^2 (Determination Coefficient) of 0.8264, and C.J Konya Y = - 43.923x +27.339, with r values: 0.90 (Correlation Coefficient) and r^2 values (Determination Coefficient) of 0.8173. So the correlation of the powder factor to sieve fragmentation 80 in each geometry is strong.

Keyword : Powder Factors, Geometric, Fragmentation, Boulder.