

ABSTRAK

ANALISIS PENGARUH GEOMETRI PELEDAKAN TERHADAP *PERCENT PULL CUT LENGTH* TAMBANG BAWAH TANAH KENCANA

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Tambang bawah tanah Kencana beroperasi dengan menggunakan metode *underhand cut and fill*. Proses pembongkaran dilakukan melalui kegiatan pengeboran dan peledakan. Pada kegiatan produksi, peledakan diharapkan mampu mencapai target kemajuan peledakan (*percent pull cut length*) sebesar 90% dari kedalaman lubang bor. Hasil aktual di lapangan menunjukkan masih terdapat 46,8% peledakan yang belum mencapai target *percent pull cut length*. Pada lokasi penelitian, terdapat dua kelas massa batuan berdasarkan klasifikasi massa batuan *rock mass rating* (RMR) yaitu batuan tipe 4 (*poor*) dan tipe 5 (*very poor*).

Penelitian ini dilakukan dengan metode statistik dan empirik yaitu dilakukan pengamatan langsung dan pengambilan data geometri peledakan, kebutuhan bahan peledak dan nilai *cut length* setiap peledakan. Pola *cut* yang digunakan adalah *large hole cut* dengan jumlah lubang bor bervariasi antara 39 hingga 44 lubang, termasuk 4 lubang kosong. Berdasarkan hasil pengambilan data, rata-rata *percent pull cut length* adalah 74,73%. *Powder factor* batuan tipe 4 adalah 2,2 kg/m³ sedangkan batuan tipe 5 adalah 2,25 kg/m³. Pendekatan yang dilakukan untuk perhitungan rancangan geometri peledakan pada penelitian ini yaitu pendekatan empiris berdasarkan teori Jimeno (1995).

Hasil perancangan ulang menghasilkan geometri peledakan dengan 44 lubang yang terdiri dari 40 lubang ledak dan 4 lubang kosong. Melalui tujuh kali uji coba, diperoleh rata-rata *percent pull cut length* sebesar 96,93%. Nilai *powder factor* uji coba rata-rata sebesar 2,48 kg/m³. Parameter yang menyebabkan tidak tercapainya target kemajuan peledakan sebelumnya yaitu *powder factor*, void ratio yang kecil, jumlah lubang yang kurang, dan jarak *burden* dan spasi yang terlalu besar.

Kata Kunci: Geometri Peledakan, *Percent Pull Cut Length*, Tambang Bawah Tanah, *Powder Factor*

ABSTRACT

ANALYSIS OF THE INFLUENCE OF BLAST GEOMETRY ON PERCENT PULL CUT LENGTH AT KENCANA UNDERGROUND MINE

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The Kencana underground mine is operated using the underhand cut and fill method. Rock breakage is conducted through drilling and blasting activities. In production activities, blasting is expected to achieve a target pull cut length of 90% of the drill hole depth. Actual results in the field show that 46.8% of blasting has not yet reached the target percent pull cut length. At the research location, there are two rock mass classes based on the rock mass rating (RMR) classification, namely type 4 (poor) and type 5 (very poor) rock.

This research was conducted out using statistic and empiric method, in which direct observations and data collection were performed for blast geometry, explosive requirements, and pull cut length values for each blast. The cut pattern applied was a large-hole cut, with the number of drill holes varying between 39 and 44, including 4 empty holes. Based on the collected data, the average pull cut length was determined to be 74.73%. The powder factor for type 4 rock was calculated at 2.2 kg/m³, while that for type 5 rock was 2.25 kg/m³. The design calculations for blast geometry in this study were conducted using an empirical approach based on Jimeno's (1995) theory.

The redesign resulted in a blast geometry comprising 44 holes, consisting of 40 charged holes and 4 empty holes. Through seven trial blasts, an average pull cut length of 96.93% was achieved. The average powder factor during the trials was 2.48 kg/m³. Factors contributing to the previous failure to achieve the target pull cut length included inadequate powder factor, low void ratio, insufficient number of holes, and excessive burden and spacing.

Keywords: *Blast Geometry, Percent Pull Cut Length, Underground Mine, Powder Factor*