

RINGKASAN

Pada operasi peledakan *overburden* di PT. Bukit Asam, Tbk. ditemukan permasalahan yaitu angka *powder factor* dan fragmentasi batuan hasil peledakan yang belum optimal sebelum menggunakan teknik *air decking* dengan perlengkapan *stemdeck*. Belum optimalnya angka *powder factor* diakibatkan konsumsi bahan peledak yang berlebih dan adanya penyimpangan *burden*, spasi dan kedalaman lubang ledak yang lebih kecil daripada desain awal peledakan. Berdasarkan perhitungan fragmentasi batuan menggunakan metode Kuz-Ram, fragmentasi batuan hasil peledakan juga belum optimal karena fragmentasi batuan ukuran *boulder* masih lebih dari 15%.

Dengan penggunaan *stemdeck*, diharapkan dapat mengurangi jumlah penggunaan bahan peledak, sehingga dapat mengurangi angka *powder factor*. Berkurangnya angka *powder factor* berarti penggunaan bahan peledak menjadi lebih efisien. Selain itu, penggunaan *stemdeck* diharapkan dapat mengoptimalkan fragmentasi batuan hasil peledakan, sehingga persentase batuan ukuran *boulder* kurang dari 15%.

Hasil penelitian menunjukkan tidak terjadi penurunan angka *powder factor*. Konsumsi bahan peledak yaitu ANFO berkurang sebanyak 5,29 kg/lubang, namun adanya penyimpangan spasi yang signifikan (rata-rata 1,92 m) menyebabkan volume *overburden* yang terbongkar juga semakin mengecil. Selain itu, hasil penelitian juga menunjukkan bahwa peledakan tanpa menggunakan *stemdeck*, berdasarkan perhitungan fragmentasi metode Kuz-Ram, menghasilkan persentase kelolosan fragmentasi batuan ukuran 1,55 m sebesar 73,42%. Sedangkan pada peledakan menggunakan *stemdeck* menghasilkan persentase kelolosan fragmentasi batuan ukuran 1,55 m 70,64%.

Untuk mencapai target fragmentasi batuan, diperlukan perbaikan geometri peledakan dan perubahan panjang *stemdeck* yang digunakan. Usulan geometri peledakan yaitu *burden* 6,8 m; spasi 7,8 m; *stemming* 3,9 m; kedalaman lubang ledak 7 m; panjang *stemdeck* 0,3 m; *powder charge* 2,8 m. menghasilkan *powder factor* 0,20 kg/m³ dan persentase kelolosan fragmentasi batuan ukuran 1,55 m 85,16%.

ABSTRACT

In overburden blasting at PT. Bukit Asam, Tbk., it was found that the powder factor and fragmentation of the rock from blasting results were not optimal before using an air decking technique with stemdeck equipment. The unoptimal number of powder factors due to excessive consumption of explosives and irregularities in burden, spacing, and explosive hole depth that are smaller than the initial blast design. Based on the calculation of rock fragmentation using the Kuz-Ram method, the fragmentation of the rock produced by blasting is also not optimal because the boulder-sized rock fragmentation still exceeds 15%.

With the use of stemdeck, it is expected to reduce the amount of use of explosives, so as to reduce the powder factor. The reduced powder factors makes the use of explosives becomes more efficient. In addition, the use of stemdeck is expected to optimize the fragmentation of rocks, so that the percentage of boulder-sized rocks are less than 15%.

The results showed no decrease in powder factor numbers. The consumption of explosives, namely ANFO, was reduced by 5,29 kg / hole, but there were significant differences in spacing (an average of 1.92 m) causing the volume of overburden to be uncovered also decrease. In addition, the results of the study also showed blasting without using stemdecks, based on the calculation of the fragmentation with Kuz-Ram method, resulting in the percentage of fragmentation breakthroughs measured by 1.55 m is 73,42%. Whereas on blasting using stemdeck, resulting in the percentage of fragmentation breakthroughs measured by 1.55 m is 70,64%.

To achieve the target of rock fragmentation, geometric blasting improvements and stem length changes are needed. The blasting geometry proposal is a 6.8 m burden; space 7.8 m; stemming 3.9 m; 7 m depth of explosive hole; stemdeck length 0.3 m; powder charge 2.8 m. produce 0.20 kg / m³ powder factor and the percentage of breakdown of rock fragmentation measuring 1.55 m 85.16%.