

ABSTRAK

STUDI TEKNIS *DRILLING*, *GROUND SUPPORT* *INSTALLATION*, DAN UTILISASI *HEADING* PADA *POOR* DAN *VERY POOR GROUND* TAMBANG BAWAH TANAH GBC PT FREEPORT INDONESIA

Oleh
Rafela Putri Rheinanta
NIM: 112210153
(Program Studi Sarjana Teknik Pertambangan)

Aktivitas pengeboran dan instalasi penyanggaan batuan pada siklus *development* tambang bawah tanah GBC PT Freeport Indonesia sering mengalami hambatan, terutama pada kondisi batuan *poor* dan *very poor*. Hal ini berdampak pada keterlambatan kemajuan *development*, sehingga diperlukan analisis durasi kerja dan utilisasi alat untuk mengetahui efektivitas operasional. Penelitian ini bertujuan untuk menganalisis faktor penyebab kehilangan waktu kerja pada kegiatan pengeboran, instalasi penyanggaan batuan, serta *heading* dengan massa batuan *poor* dan *very poor*. Adanya waktu tunda menyebabkan penundaan aktivitas kerja dalam siklus *development* telah menyebabkan kemunduran target kemajuan yang direncanakan dalam beberapa bulan terakhir. Dalam penelitian ini, metode yang digunakan menggunakan pendekatan empiris dan berdasarkan observasi lapangan untuk memperoleh faktor-faktor kehilangan waktu kerja yang terjadi. Hasil penelitian menunjukkan bahwa kehilangan waktu kerja pada unit kerja *jumbo drill* disebabkan oleh *delay time* sebesar 23%-45%, *down time* sebesar 14%-69%, dan *standby time* alat sebesar 8%-41% pada *jumbo drill* yang mengakibatkan aktivitas tertunda. Berdasarkan Kepmen ESDM No. 1827 Tahun 2018, nilai utilisasi *heading* di lokasi penelitian tergolong rendah, yaitu di bawah 65%. Sehingga diperlukan perbaikan manajemen waktu dan efisiensi operasional pada kegiatan siklus *development* pada kondisi batuan *poor* dan *very poor*. Faktor-faktor yang memengaruhi keterlambatan kemajuan terowongan pada siklus *development* di kondisi batuan *poor* dan *very poor* didominasi oleh faktor alat sebesar 42%–56% dan faktor manusia sebesar 44%–55%, sedangkan pengaruh dari kondisi area kerja relatif kecil, yaitu sekitar 3%.

Kata kunci: batuan buruk, batuan sangat buruk, *heading*, pengeboran, penyanggaan batuan, waktu tunda

ABSTRACT

TECHNICAL STUDY OF DRILLING, GROUND SUPPORT INSTALLATION, AND HEADING UTILIZATION IN POOR AND VERY POOR GROUND CONDITIONS AT THE GBC UNDERGROUND MINE, PT FREEPORT INDONESIA

By

Rafela Putri Rheinanta

NIM: 112210153

(Mining Engineering Undergraduated Program)

Drilling and ground support installation activities in the development cycle of the GBC underground mine at PT Freeport Indonesia often encountered obstacles, particularly under poor and very poor rock conditions. These challenges resulted in delays to development progress, making it necessary to analyze work duration and equipment utilization to assess operational effectiveness. This study aimed to analyze the factors causing work time losses during drilling, rock support installation, and heading activities in poor and very poor rock mass conditions. The occurrence of delays led to postponed work activities in the development cycle, which in turn caused setbacks to planned progress targets in recent months. The research employed an empirical approach based on field observations to identify the factors contributing to work time losses. The results showed that work time losses in jumbo drill operations were caused by delay time ranging from 23% to 45%, down time ranging from 14% to 69%, and equipment standby time ranging from 8% to 41%, which ultimately hindered activities. According to the Indonesian Ministry of Energy and Mineral Resources Decree No. 1827 of 2018, heading utilization values in the study area were classified as low, below 65%. Therefore, improvements in time management and operational efficiency were deemed necessary for development cycle activities in poor and very poor rock conditions. The factors influencing tunnel development delays under such conditions were predominantly equipment-related (42%–56%) and human-related (44%–55%), while the influence of the work area conditions was relatively minor, at approximately 3%.

Keywords: delay time, drilling, ground support installation, heading, poor ground, very poor ground