ABSTRAK

ANALISIS *FUEL RATIO* PENAMBANGAN BATUBARA MENGGUNAKAN METODE AUGER PADA PIT KGU PT AUGER SISTEM INDONESIA

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Kegiatan auger mining memerlukan pengendalian penggunaan bahan bakar agar produksi batubara tercapai secara efisien. Penelitian ini bertujuan menganalisis perbedaan *fuel ratio* rencana dan aktual serta mengidentifikasi parameter geologi dan operasional yang memengaruhinya pada kegiatan PT Auger Sistem Indonesia di area kerja PT Borneo Indobara. Penelitian dilakukan dengan membandingkan data rencana dan aktual selama Februari 2026 yang meliputi *fuel consumption*, produksi, kondisi geologi, kecepatan pengeboran, dan kondisi operasional. Regresi linear sederhana digunakan untuk menganalisis pengaruh kecepatan pengeboran terhadap *fuel ratio* aktual, sedangkan regresi linear berganda digunakan untuk menguji pengaruh *operating delay* dan *maintenance and repair*.

Hasil penelitian menunjukkan bahwa *fuel ratio* rencana sebesar 0,644 liter/ton dan aktual sebesar 0,747 liter/ton, dengan deviasi 0,104 liter/ton atau meningkat 16,11% terhadap rencana. Faktor geologi meliputi ketercapaian kedalaman pengeboran, *parting* batulanau, serta kontak jalur pengeboran dengan *roof* atau *floor* batulempung. Kondisi tersebut tercermin dari perubahan kecepatan pengeboran. Hasil regresi linear sederhana menunjukkan bahwa kecepatan pengeboran berpengaruh negatif dan signifikan terhadap *fuel ratio* aktual dengan persamaan $FR = 1{,}411 - 0{,}716v$, nilai signifikansi kurang dari 0,001, dan koefisien determinasi sebesar 95,8%. Hasil regresi linear bergandan menunjukkan bahwa *operating delay* dan *maintenance and repair* secara simultan tidak berpengaruh signifikan terhadap *fuel ratio* aktual. Namun, secara parsial, *maintenance and repair* berpengaruh signifikan dengan nilai signifikansi 0,042. Dengan demikian, peningkatan *fuel ratio* aktual berkaitan dengan hambatan geologi yang menurunkan kecepatan dan ketercapaian kedalaman pengeboran serta konsumsi bahan bakar nonproduktif, sehingga pemantauan kecepatan pengeboran dan pengendalian *maintenance and repair* perlu diprioritaskan.

Kata kunci: *Fuel Consumption*, *Fuel Ratio*, Penambangan Auger, Produksi, Regresi Linear

ABSTRACT

FUEL RATIO ANALYSIS OF COAL MINING USING THE AUGER METHOD AT PIT KGU, PT AUGER SISTEM INDONESIA

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Auger mining operations require effective fuel-use control to ensure efficient coal production. This study aimed to evaluate the difference between planned and actual fuel ratios and to identify the geological and operational parameters affecting the actual fuel ratio at PT Auger Sistem Indonesia within the operational area of PT Borneo Indobara. The study compared planned and actual data collected in February 2026, including fuel consumption, production, geological conditions, drilling rate, and operational conditions. Simple linear regression was applied to examine the effect of drilling rate on the actual fuel ratio, while multiple linear regression was used to evaluate the effects of operating delay and maintenance and repair.

The results showed that the planned fuel ratio was 0.644 L/tonne, whereas the actual fuel ratio was 0.747 L/tonne, resulting in a deviation of 0.104 L/tonne or an increase of 16.11% above the planned value. The geological factors included drilling-depth achievement, the presence of siltstone partings, and contact between the drilling path and the claystone roof or floor. These conditions were reflected in variations in the drilling rate. The simple linear regression analysis indicated that the drilling rate had a significant negative effect on the actual fuel ratio, as expressed by the equation $FR = 1.411 - 0.716v$*, with a significance value of less than 0.001 and a coefficient of determination of 95.8%. The multiple linear regression analysis showed that operating delay and maintenance and repair did not have a significant simultaneous effect on the actual fuel ratio. However, maintenance and repair had a significant partial effect, with a significance value of 0.042. Therefore, the higher fuel ratio resulted from geological constraints that reduced drilling rate and depth achievement, as well as fuel use during non-productive activities. Drilling-rate monitoring and maintenance control should therefore be prioritized to improve fuel efficiency.*

Keywords: Auger Mining, Fuel Consumption, Fuel Ratio, Production, Linear Regression