PLAGIAT MERUPAKAN TINDAKAN TIDAK TERPUJI

ABSTRAK

Excavator merupakan alat berat yang memiliki peranan penting dalam kegiatan operasional pertambangan, khususnya pada proses penggalian, pemuatan, dan pemindahan material. Intensitas penggunaan excavator yang tinggi dapat menyebabkan terjadinya kerusakan (*failure*) yang berdampak terhadap peningkatan waktu henti (*downtime*) dan penurunan ketersediaan alat (*availability*). Oleh karena itu, diperlukan evaluasi kinerja pemeliharaan untuk mengetahui tingkat keandalan (*reliability*) dan kemampuan perbaikan (*maintainability*) unit excavator. Penelitian ini bertujuan untuk menganalisis kinerja perawatan excavator di PT. HA menggunakan metode *reliability* dan *maintainability*. Metode penelitian yang digunakan adalah kuantitatif deskriptif dengan pendekatan *reliability engineering*. Data penelitian diperoleh dari enam unit excavator, yaitu S314, S315, S316, S317, S318, dan S319 selama periode Januari–Februari 2026, yang meliputi data *operating hour*, *downtime*, jumlah kerusakan (*failure*), dan riwayat pemeliharaan. Analisis dilakukan menggunakan parameter *Mean Time Between Failure* (MTBF), *Mean Time To Repair* (MTTR), dan *Physical Availability* (PA). Hasil penelitian menunjukkan adanya variasi tingkat keandalan antarunit. Nilai MTBF tertinggi pada Januari diperoleh unit S318 sebesar 574 jam, sedangkan nilai terendah terdapat pada unit S316 sebesar 43 jam. Pada Februari, unit S315 mengalami penurunan keandalan dengan nilai MTBF sebesar 44 jam. Nilai MTTR tertinggi terjadi pada unit S316 sebesar 5,96 jam pada Januari dan unit S318 sebesar 3,52 jam pada Februari. Hasil perhitungan PA menunjukkan sebagian besar unit memiliki tingkat ketersediaan yang baik, namun unit S316 mengalami penurunan signifikan menjadi 48,28% akibat kegiatan *overhaul*. Berdasarkan hasil analisis, sistem pemeliharaan excavator di PT. HA telah berjalan cukup baik, tetapi masih diperlukan peningkatan pada penerapan *preventive maintenance*, pengendalian *downtime*, serta ketersediaan suku cadang untuk meningkatkan keandalan dan kesiapan operasional alat.

Kata kunci: *Excavator*, *maintainability*, MTBF, MTTR, *physical availability*, *preventive maintenance*, *reliability*.

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ABSTRACT

Excavators are heavy equipment that play an important role in mining operations, particularly in excavation, loading, and material handling activities. The high intensity of excavator utilization may cause equipment failures, resulting in increased downtime and reduced equipment availability. Therefore, maintenance performance evaluation is required to determine the reliability and maintainability of excavator units. This study aims to analyze excavator maintenance performance at PT. HA using reliability and maintainability methods. A descriptive quantitative method with a reliability engineering approach was applied. The research data were obtained from six excavator units, namely S314, S315, S316, S317, S318, and S319, during January–February 2026, including operating hours, downtime, failure occurrences, and maintenance records. The analysis was conducted using Mean Time Between Failure (MTBF), Mean Time To Repair (MTTR), and Physical Availability (PA) parameters. The results showed variations in reliability performance among units. The highest MTBF value in January was obtained by unit S318 at 574 hours, while the lowest value was recorded for unit S316 at 43 hours. In February, unit S315 experienced a decrease in reliability with an MTBF value of 44 hours. The highest MTTR value occurred on unit S316 at 5.96 hours in January and unit S318 at 3.52 hours in February. The Physical Availability results indicated that most units maintained good availability performance; however, unit S316 experienced a significant decrease to 48.28% due to overhaul activities. Based on the analysis, the excavator maintenance system at PT. HA has been implemented adequately; however, improvements are still required in preventive maintenance implementation, downtime control, and spare part availability to improve equipment reliability and operational readiness.

Keywords: Excavator, maintainability, MTBF, MTTR, physical availability, preventive maintenance, reliability.