

ABSTRAK

Tingginya frekuensi kerusakan (breakdown) pada mesin *Empty Handler* di PT Terminal Teluk Lamong menjadi salah satu hambatan utama dalam kelancaran operasional terminal. Permasalahan ini berdampak pada meningkatnya waktu henti mesin (downtime), menurunnya produktivitas, serta rendahnya nilai *Overall Equipment Effectiveness* (OEE) yang berada di bawah standar *World Class Manufacturing*. Berdasarkan hasil pengamatan awal, penyebab utama dari tingginya tingkat kerusakan adalah penjadwalan *preventive maintenance* yang belum optimal, di mana pendekatan yang digunakan masih bersifat statis dan belum mempertimbangkan kondisi aktual mesin. Penelitian ini menggunakan pendekatan kuantitatif dengan metode perhitungan OEE, analisis *Six Big Losses*, serta pemetaan akar permasalahan melalui diagram pareto dan diagram keterkaitan. Selain itu, dilakukan analisis *Time to Failure* (TTF) dan *Time to Repair* (TTR) untuk memperoleh nilai *Mean Time to Failure* (MTTF) dan *Mean Time to Repair* (MTTR). Data kerusakan kemudian dianalisis menggunakan distribusi probabilitas Weibull dan Lognormal untuk menentukan pola kerusakan serta interval waktu perawatan yang optimal. Selanjutnya dilakukan perbandingan antara biaya perawatan aktual perusahaan dengan biaya usulan berdasarkan interval yang telah dioptimalkan. Hasil penelitian menunjukkan bahwa usulan interval *preventive maintenance* berbasis data historis mampu memperpanjang umur pakai komponen, menurunkan frekuensi kerusakan mendadak, serta mengurangi total biaya perawatan. Diharapkan usulan jadwal perawatan ini dapat menjadi dasar pertimbangan dalam pengambilan keputusan strategis terkait manajemen pemeliharaan mesin di PT Terminal Teluk Lamong.

Kata kunci : *Preventive Maintenance*, *Breakdown*, *Empty Handler*, Interval Waktu, Biaya Perawatan

ABSTRAC

The high frequency of breakdowns in Empty Handler machines at PT Terminal Teluk Lamong has become a major obstacle to smooth terminal operations. This issue results in increased machine downtime, decreased productivity, and low Overall Equipment Effectiveness (OEE), which remains below the World Class Manufacturing standard. Based on initial observations, the primary cause of the high breakdown rate is the suboptimal scheduling of preventive maintenance, which is currently implemented using a static approach that does not reflect the actual condition of the machines. This research employs a quantitative approach through the calculation of OEE, analysis of the Six Big Losses, and root cause identification using Pareto and relationship diagrams. Furthermore, Time to Failure (TTF) and Time to Repair (TTR) analyses are conducted to obtain Mean Time to Failure (MTTF) and Mean Time to Repair (MTTR). Failure patterns are determined through Weibull and Lognormal probability distribution testing to establish optimal maintenance intervals. A cost comparison is also made between the company's actual maintenance costs and the proposed costs based on the optimized maintenance intervals. The results show that the proposed preventive maintenance intervals, which are based on historical data analysis, can extend component life, reduce the frequency of unexpected breakdowns, and lower total maintenance costs. This proposed maintenance schedule is expected to serve as a strategic reference in decision-making for improving maintenance management at PT Terminal Teluk Lamong.

Keywords: Preventive Maintenance, Breakdown, Empty Handler, Time Interval, Maintenance Cost