

ABSTRAK

Penelitian ini bertujuan untuk menganalisis efektivitas preventive maintenance pada forklift dan reach truck di PT Medan Distribusindo Raya melalui perhitungan Mean Time Between Failure (MTBF), Mean Time To Repair (MTTR), dan Risk Priority Number (RPN). Berdasarkan data kerusakan tahun 2024, nilai MTBF forklift dan reach truck tercatat sebesar ± 717 jam, sementara MTTR rata-rata berada pada 1,79 jam. Komponen dengan kontribusi kerusakan terbesar diidentifikasi melalui perhitungan RPN, yaitu hydraulic pump, battery forklift, battery 48V/lithium, dan silinder hidrolis. Hasil analisis menunjukkan bahwa interval preventive maintenance yang optimal berada pada rentang 15–21 hari atau 40–70% dari nilai MTBF, sehingga perawatan dapat dilakukan sebelum terjadinya kegagalan. Penerapan strategi pemeliharaan berbasis MTBF–MTTR terbukti meningkatkan nilai availability menjadi 99,77% pada forklift dan 99,75% pada reach truck. Dengan demikian, metode ini mampu meningkatkan keandalan peralatan serta menurunkan downtime secara signifikan.

Kata kunci: MTBF, MTTR, RPN, preventive maintenance, availability

ABSTRACT

This study aims to analyze the effectiveness of preventive maintenance for forklifts and reach trucks at PT Medan Distribusindo Raya using Mean Time Between Failure (MTBF), Mean Time To Repair (MTTR), and Risk Priority Number (RPN). Based on equipment failure data from 2024, the MTBF for both types of equipment reached approximately 717 hours, while the average MTTR was 1.79 hours. Critical components contributing most to failures—identified through RPN—include the hydraulic pump, forklift battery, 48V/lithium battery, and hydraulic cylinder. The analysis indicates that the optimal preventive maintenance interval is 15–21 days, equivalent to 40–70% of MTBF, ensuring maintenance is performed before failure occurs. Implementation of MTBF–MTTR-based maintenance improved equipment availability to 99.77% for forklifts and 99.75% for reach trucks. These findings demonstrate that this method effectively enhances equipment reliability and significantly reduces downtime.

Keywords: *MTBF, MTTR, RPN, preventive maintenance, availability*