

ABSTRAK

USULAN PERAWATAN PADA MESIN CARDING DI PT WATUSALAM TEXTILE DENGAN METODE *RISK BASED MAINTENANCE (RBM)*

Andini Dayu Ainayya
H1E021011

Mesin memegang peranan penting dalam industri manufaktur, karena kerusakan mesin berdampak pada penurunan kemampuan produksi, peningkatan biaya operasional, dan penurunan kepuasan pelanggan. PT Watusalam Textile (Wastex) merupakan perusahaan manufaktur tekstil yang menggunakan sembilan unit mesin carding sebagai bagian krusial dalam proses spinning. Selama ini, perusahaan hanya menerapkan *corrective maintenance* tanpa program *preventive maintenance* yang terstruktur, sehingga frekuensi kerusakan, khususnya pada mesin nomor 3, 7, dan 8, cenderung tinggi dan meningkat dari tahun ke tahun. Kondisi ini menyebabkan kerugian berupa *system performance loss* yang meliputi kehilangan produksi akibat downtime dan biaya perbaikan. Namun, risiko tersebut belum pernah dihitung secara kuantitatif oleh perusahaan. Penelitian ini bertujuan menganalisis risiko *system performance loss* pada mesin carding menggunakan metode *Risk-Based Maintenance (RBM)* untuk memetakan tingkat risiko pada tiap subsistem, kemudian menyusun usulan strategi *preventive maintenance* bagi subsistem prioritas menggunakan metode *Reliability-Centered Maintenance II (RCM II)*. Analisis *RBM* dilakukan dengan menghitung nilai risiko berdasarkan probabilitas dan konsekuensi kegagalan, sedangkan *RCM II* digunakan untuk menentukan tindakan perawatan dan interval optimal pada subsistem kritis. Hasil penelitian menunjukkan bahwa nilai risiko tertinggi terdapat pada mesin carding 3 sebesar Rp185.283.570, mesin carding 7 sebesar Rp163.157.671, dan mesin carding 8 sebesar Rp165.028.711, yang melebihi ambang batas penerimaan risiko perusahaan sebesar 0,8%. Subsistem kritis yang teridentifikasi adalah main cylinder, licker in, FBK, dan doffer. Usulan interval perawatan yang dihasilkan antara lain untuk mesin carding 3 adalah setiap 9 hari (main cylinder), 6 hari (licker in), dan 8 hari (FBK); mesin carding 7 setiap 11 hari (FBK), 10 hari (main cylinder), dan 9 hari (doffer); serta mesin carding 8 setiap 8 hari (licker in), 11 hari (main cylinder), dan 8 hari (FBK). Penerapan integrasi *RBM* dan *RCM II* ini diharapkan dapat menurunkan frekuensi kerusakan, mengurangi potensi risiko finansial, serta meningkatkan keandalan sistem produksi di PT Wastex.

Kata kunci: *Risk-Based Maintenance, Reliability Centered Maintenance II, system performance loss, mesin carding, preventive maintenance.*

ABSTRACT

MAINTENANCE STRATEGY FOR CARDING MACHINE AT PT WATUSALAM TEXTILE USING RISK BASED MAINTENANCE (RBM) APPROACH

**Andini Dayu Ainayya
H1E021011**

Machines play a crucial role in manufacturing industries, as failures can lead to reduced production capacity, increased operational costs, and decreased customer satisfaction. PT Watusalam Textile (Wastex) is a textile manufacturing company operating nine carding machines as a critical part of its spinning process. To date, the company has only implemented corrective maintenance without a structured preventive maintenance program, resulting in a high and increasing frequency of breakdowns, particularly on machines No. 3, 7, and 8. This condition has caused system performance loss, including production losses due to downtime and repair costs. However, these risks have never been quantitatively assessed by the company. This study aims to analyze the risk of system performance loss in carding machines using the Risk-Based Maintenance (RBM) method to map risk levels in each subsystem, followed by the development of preventive maintenance strategies for priority subsystems using the Reliability Centered Maintenance II (RCM II) method. RBM analysis was conducted by calculating risk values based on the probability and consequences of failure, while RCM II was used to determine appropriate maintenance actions and optimal intervals for critical subsystems. The results indicate that the highest risk values were found in carding machine No. 3 at IDR 185.283.570, machine No. 7 at IDR 163.157.671, and machine No. 8 at IDR 165.028.711—exceeding the company's acceptable risk threshold of 0.8%. The identified critical subsystems include the main cylinder, licker-in, FBK, and doffer. The proposed maintenance intervals are as follows: for carding machine No. 3—every 9 days (main cylinder), 6 days (licker-in), and 8 days (FBK); for machine No. 7—every 11 days (FBK), 10 days (main cylinder), and 9 days (doffer); and for machine No. 8—every 8 days (licker-in), 11 days (main cylinder), and 8 days (FBK). The integration of RBM and RCM II is expected to reduce breakdown frequency, minimize potential financial risks, and improve the overall reliability of the production system at PT Wastex.

Keywords : Risk-Based Maintenance, Reliability Centered Maintenance II, system performance loss, carding machine, preventive maintenance.