ABSTRAK

Penelitian ini bertujuan untuk merancang dan membangun aplikasi berbasis web dalam menentukan jadwal *preventive maintenance* aset mesin produksi air pada Perumda Tirta Musi Palembang menggunakan metode *Reliability Centered Maintenance* (RCM). Permasalahan utama yang ada yaitu pengelolaan data aset dan riwayat kerusakan yang belum terstruktur serta belum adanya sistem penjadwalan perawatan yang terencana, sehingga perawatan masih bersifat *corrective*. Metode yang digunakan adalah *Software Development Life Cycle* (SDLC) dengan pendekatan *prototype*, serta metode RCM dengan pendekatan *Failure Mode and Effect Analysis* (FMEA) untuk menentukan prioritas perawatan berdasarkan nilai *Risk Priority Number* (RPN). Sistem yang dikembangkan mencakup pengelolaan data aset, riwayat kerusakan, perhitungan RPN, penjadwalan *preventive maintenance*, serta estimasi biaya berdasarkan data *downtime*. Hasil penelitian menunjukkan bahwa sistem mampu membantu perusahaan dalam mengelola data secara terstruktur, menentukan prioritas perawatan, mengurangi risiko kerusakan, serta memperkirakan anggaran *maintenance* secara lebih efektif. Dengan demikian, sistem ini dapat mendukung pengambilan keputusan dan meningkatkan keandalan mesin produksi air.

Kata kunci: *Preventive maintenance*, *Reliability Centered Maintenance*, FMEA, RPN, *Downtime*

ABSTRACT

This study aims to design and develop a web-based application for determining preventive maintenance schedules of water production machine assets at Perumda Tirta Musi Palembang using the Reliability Centered Maintenance (RCM) method. The main problems identified include unstructured asset data Managementt, lack of systematic failure history recording, and the absence of a planned maintenance scheduling system, resulting in predominantly corrective maintenance practices. The study applies the Software Development Life Cycle (SDLC) with a prototype approach, combined with the RCM method using Failure Mode and Effect Analysis (FMEA) to prioritize maintenance based on the Risk Priority Number (RPN). The developed system includes asset data Managementt, failure history recording, RPN calculation, preventive maintenance scheduling, and cost estimation based on downtime data. The results indicate that the system effectively improves structured data Managementt, determines maintenance priorities, reduces the risk of machine failure, and provides more accurate maintenance cost estimation. Therefore, the system supports better decision-making and enhances the reliability of water production machines.

Keywords: *Preventive maintenance, Reliability Centered Maintenance, FMEA, RPN, Downtime*