

ABSTRAK

PT Multimas Nabati Asahan adalah salah satu produsen minyak nabati yang mengalami permasalahan tingginya frekuensi kerusakan mendadak pada mesin pompa sentrifugal, dengan rata rata mencapai 12 jam perbulan yang berdampak negatif terhadap pencapaian target produksi, efisiensi operasional dan peningkatan biaya produksi. Metodologi penelitian mencakup identifikasi komponen kritis, analisis kegagalan melalui *Failure Mode and Effect Analysis* (FMEA) dan *Logic Tree Analysis* (LTA) untuk menentukan prioritas tindakan pemeliharaan. Hasil penelitian menunjukkan bahwa *mechanical seal* merupakan komponen dengan nilai RPN tertinggi sebesar 504, diikuti *rubber coupling* dan *bearing*. Dari hasil *task selection*, diperoleh rekomendasi tindakan pemeliharaan berupa *time directed maintenance*, *condition based maintenance*, dan *failure finding*. Penerapan RCM mampu menurunkan frekuensi kerusakan mendadak, mengoptimalkan biaya pemeliharaan, serta meningkatkan keandalan dan produktivitas mesin pompa sentrifugal. Penelitian ini diharapkan dapat menjadi acuan strategis dalam sistem manajemen pemeliharaan mesin di industri pengolahan kelapa sawit.

Kata kunci: *Reliability Centered Maintenance*, FMEA, *Logic Tree Analysis*, *Downtime*, Mesin Pompa Sentrifugal.

ABSTRACT

PT Multimas Nabati Asahan is one of the vegetable oil producers that experiences a high frequency of sudden breakdowns in centrifugal pump machines, averaging 12 hours per month, which negatively impacts production target achievement, operational efficiency, and increased production costs. The research methodology includes the identification of critical components, failure analysis through Failure Mode and Effect Analysis (FMEA) and Logic Tree Analysis (LTA) to determine the priority of maintenance actions. The research results show that the mechanical seal is the component with the highest RPN value of 504, followed by the rubber coupling and bearing. From the task selection results, maintenance action recommendations berupa time directed maintenance, condition based maintenance, and failure finding were obtained. The implementation of RCM is capable of reducing the frequency of sudden failures, optimizing maintenance costs, and improving the reliability and productivity of centrifugal pump machines. This research is expected to serve as a strategic reference in the machinery maintenance management system in the palm oil processing industry.

Keywords: Reliability Centered Maintenance, FMEA, Logic Tree Analysis, Downtime, Centrifugal Pump Machine.