Abstrak

PTPN IV Regional I Unit Pabrik Kernel Oil (PKO) Sei Mangkei merupakan unit pengolahan inti sawit yang menghasilkan Crude Palm Kernel Oil (CPKO) dan Palm Kernel Meal (PKM). Dalam proses produksi, keandalan mesin *First Press* dan *Second Press* sangat berpengaruh terhadap kualitas produk dan efisiensi operasional. Namun, pada kondisi aktual masih sering terjadi kerusakan mesin, khususnya pada komponen *screw* yang mengalami keausan sehingga menyebabkan meningkatnya *oil losses* dan menurunnya kinerja mesin. Penelitian ini bertujuan untuk mengevaluasi sistem pemeliharaan, perawatan, dan perbaikan mesin *First Press* dan *Second Press* menggunakan metode Failure Mode and Effect Analysis (FMEA). Metode penelitian dilakukan melalui observasi langsung di lapangan, wawancara dengan pihak terkait, serta pengumpulan data kerusakan mesin. Setiap potensi kegagalan dianalisis berdasarkan nilai *severity*, *occurrence*, dan *detection* untuk menentukan Risk Priority Number (RPN). Hasil analisis menunjukkan bahwa keausan *screw* merupakan mode kegagalan dengan nilai RPN tertinggi dan menjadi prioritas utama perbaikan. Oleh karena itu, diperlukan perbaikan sistem pemeliharaan melalui penjadwalan perawatan yang lebih teratur, peningkatan pengawasan kondisi mesin, serta penerapan standar operasional prosedur yang konsisten. Dengan penerapan rekomendasi tersebut, diharapkan keandalan mesin dapat meningkat, risiko kerusakan dapat diminimalkan, dan target produksi perusahaan dapat tercapai secara optimal.

Kata Kunci : Failure Mode and Effect Analysis (FMEA), Pemeliharaan Mesin, First Press, Second Press, Crude Palm Kernel Oil (CPKO)

ABSTRACT

PTPN IV Regional I Sei Mangkei Kernel Oil (PKO) Plant Unit is a palm kernel processing unit that produces Crude Palm Kernel Oil (CPKO) and Palm Kernel Meal (PKM). In the production process, the reliability of the First Press and Second Press machines significantly affects product quality and operational efficiency. However, in actual conditions, machine failures still frequently occur, especially in screw components that experience wear, causing increased oil losses and decreased machine performance. This study aims to evaluate the maintenance, care, and repair system of the First Press and Second Press machines using the Failure Mode and Effect Analysis (FMEA) method. The research method was carried out through direct observation in the field, interviews with related parties, and collection of machine failure data. Each potential failure was analyzed based on severity, occurrence, and detection values to determine the Risk Priority Number (RPN). The analysis results showed that screw wear was the failure mode with the highest RPN value and was the main priority for repair. Therefore, improvements to the maintenance system are needed through more regular maintenance scheduling, increased monitoring of machine conditions, and consistent implementation of standard operating procedures. By implementing these recommendations, it is expected that machine reliability can be increased, the risk of damage can be minimized, and the company's production targets can be optimally achieved.

Keywords: Failure Mode and Effect Analysis (FMEA), Machine Maintenance, First Press, Second Press, Crude Palm Kernel Oil (CPKO)