FAILURE ANALYSIS OF CRITICAL COMPONENTS ON THE WASHING ROLL UNIT USING THE FAILURE MODE AND EFFECTS ANALYSIS (FMEA) METHOD AT WOOD PREPARATION PT INDAH KIAT PULP & PAPER

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ABSTRACT

The washing roll machine at PT Indah Kiat Pulp & Paper (IKPP) Perawang is highly susceptible to mechanical failures due to heavy dynamic loads, causing up to 28.5 hours of production downtime in six months. This study aims to identify and mitigate critical component failures using the Failure Mode and Effects Analysis (FMEA) method. Out of 32 identified failure modes, the Pareto Diagram (80/20 rule) prioritized 4 most critical components based on the highest *Risk Priority Number* (RPN): loose bearing housing bolts (601.35), worn transmission *Chain* pins (488.44), bent main *Shaft* (425.85), and broken/detached *Chain* connecting links (375.11). The 5 *Whys* analysis revealed that these failures are triggered by continuous shock loads and the lack of standardized routine maintenance. As a solution, a Preventive Maintenance Schedule based on international critical limits (ISO 10816-3 for vibration, SKF guidelines for bearing temperature, and ANSI standards for *Chain* slack) is proposed. This recommendation is expected to transform the maintenance system from corrective to predictive, thereby improving overall machine reliability.

Keywords: *Washing Roll Machine, FMEA, Risk Priority Number (RPN), Pareto Diagram, Preventive Maintenance.*