

ABSTRACT

This study aims to improve the efficiency of the reconditioning process for Grinding Roll components in Coal Pulverizers by applying the Lean Manufacturing approach. The main issues identified include long lead times, excessive resource consumption (waste), and inconsistent process quality. The research was conducted at PLN PUSHARLIS UP2W I, focusing on a single production line in 2023. Data were collected through field observations, interviews, and surveys. The analysis employed Value Stream Mapping (VSM) to identify waste, the Waste Assessment Model (WAM) to determine root causes and relationships between waste types, and prioritization using Lean Matrix 1 and Lean Matrix 2. The most significant waste types identified were defect, excessive processing, and waiting. Root causes included the absence of SOPs for defect handling, limited worker competency, and non-optimal production control systems. Key improvement recommendations included WEA3 (implementation of SOP for defect handling), WEA5 (worker training and certification), WEA9 (5S/5R application), and WEA10 (strategic development of an IoT-based smart monitoring system). The future state VSM shows a lead time reduction from 6275 minutes to 4247 minutes and a decrease in non-value-added time from 1000 minutes to 584 minutes—representing a 31.8% improvement in process efficiency. These findings demonstrate that integrating lean tools and WAM analysis effectively reduces waste and improves the operational performance of reconditioning processes.

Keywords: Grinding Roll, Coal Pulverizer, Lean Manufacturing, Waste Assessment Model, Value Stream Mapping