

ABSTRACT

Machinery is one of the important equipment in a manufacturing company to produce goods. PT XYZ is a manufacturing company that produces various products to support infrastructure in Bali. One of the products is 10x20x8 cm of black paving. In producing the paving, they use four machines. However, in the period of Juni 2018 – December 2019, it was the highest frequency of machine breakdowns on paving molding machine, where 27 breakdowns were found. This resulted in the performance and productivity of the machine is not optimal. Steps that can be taken to overcome these problems are evaluating the effectiveness of the paving printing machine. This final project aims to design a paving machine maintenance system using two methods, which are Overall Equipment Effectiveness (OEE) and Overall Resource Effectiveness (ORE), to evaluate the effectiveness of a paving machine with the aim of evaluating the effectiveness of the machine by considering the overall resources (human, machine, material and methods). Based on the results of OEE and ORE calculations, the OEE and ORE values of paving machines in June 2018 – December 2019 were 68.18% and 64.54%, which means the OEE and ORE were still below the standard of the Japan Institute of Plant Maintenance of 85%. The low values of OEE and ORE were both caused by the low performance efficiency factors. Based on the calculation of the six big losses to determine the losses that arise from the production process, there are two dominant loss factors that have the most influence on the effectiveness of the paving molding machine, which are the high value of reduced speed loss and idling and minor stoppages loss. The values of reduced speed loss and idling and minor stoppages loss are 51.92% and 23.69%. The cause of the low effectiveness of the machine based on the cause-and-effect diagram (fishbone) is influenced by human factors, machines, materials / spare parts, and methods. The low OEE and ORE values can be used as an evaluation to increase the effectiveness of the paving molding machine with an integrated system design. The integrated system consists of human, machine, and method aspects in the form of a machine maintenance system design. This machine maintenance system is based on autonomous maintenance, which means that the operator is given the responsibility and trust to maintain the condition of the machine so the damage of the paving molding machine at PT XYZ can be minimized. The pillars of TPM that will be used to overcome the problem of the low effectiveness of paving molding machine are autonomous maintenance, planned maintenance, and quality maintenance at PT XYZ.

Keywords: Overall Equipment Effectiveness, Overall Resource Effectiveness, Six Big Losses, Cause-and-Effect Diagram, Total Productive Maintenance.