ABSTRACT

CV XYZ *is a manufacturing company that produces industrial machine spare parts. The purpose of producing spare parts is to anticipate damage or shortages in machinery during the production process. This way, if there are components that fail to function in the midst of production and the spare parts are already available, the damage can be addressed quickly. In its production process, the nozle wafer stick production line shows a failure to meet production targets. Based on the results of observations, interviews, and fishbone identification conducted, one of the causes of the problem is the damage or downtime of the turret milling machine. The downtime that occurred was* 7552 *minutes. The factors causing downtime on the turret milling machine include component damage, which requires repair actions such as replacing the damaged components and providing lubrication. It is known that the components with the highest turnover and failure frequency in* 2023 *are found in end milling. In the machine maintenance system,* CV XYZ *uses a corrective maintenance method, which means that maintenance and servicing activities will be carried out after a malfunction occurs in the equipment, rendering it unable to function properly. Therefore, an assessment of the effectiveness of machine usage was conducted using the* OEE *(Overall Equipment Effectiveness) method. The calculation resulted in an actual condition of* 62%, *while the international standard target is* 85%. *Factors contributing to the low* OEE *value include an availability rate of* 93%, *performance efficiency of* 68%, *and quality rate of* 98%. *This indicates low machine performance and the need for maintenance actions. The failure to achieve the* OEE *value was analyzed using the six big losses method, and it was found that the largest loss occurred in reduce speed losses at* 29%. *This was followed by other losses, namely idling and minor stoppages, with an average of* 23%, *equipment failure loss with an average of* 7%, *setup and adjustment with an average of* 6%, *defect losses averaging* 1%, *and reduce yield loss at* 0%. *These losses occur when waiting or temporarily stopping the machine. Efforts to increase operational speed and reduce minor disruptions can lead to a significant improvement in production efficiency. To address this issue, the Total Productive Maintenance* (TPM) *method is implemented by applying planned*

maintenance through scheduling and autonomous maintenance through machine condition maintenance using standard check sheets for Cleaning, Lubricating, Inspection, and Tightening (CLIT). *Calculations using the age replacement method require the values of Time to Repair* (TTR) *and Time to Failure* (TTF) *to determine the distribution used. In the turret milling machine, the index of fit was obtained using the least-square curve-fitting method, which involves selecting the distribution based on the highest correlation coefficient. The* TTR *and* TTF *values used the weibull distribution, with correlation values of* 0.986 *and* 0.963, *respectively. Then, it was followed by a distribution fit test, which showed that the P-value for the turret milling machine with a weibull distribution is* 0.150 > 0.05, *indicating that the data is indeed weibull distributed. The P-value for the turret milling machine with a weibull distribution is* 0.150 > 0.05, *confirming that the data is indeed weibull distributed. Consequently, the scheduling design results in inspection and component replacement times of every* 111 *hours and* 180 *hours. Based on the availability value obtained from the calculations using age replacement, an availability value of* 98.78% *was achieved.*

Keywords*: OEE, *Six Big Losses*, TPM, *Age Replacement