

ABSTRACT

Toshiba machine is one of the CNC machines that has the highest frequency of damage compared to other CNC machines at PT XYZ. Machine damage that can occur continuously has an impact on the company operations that can make the main activities can not be done. Therefore, it is necessary to have a Reliability, Availability, and Maintainability (RAM) analysis to determine the performance of machine and to reduce the frequency of damage to the critical subsystem of the machine. Toshiba machines have six subsystems, using the risk matrix there are three critical subsystems namely hydraulic, coolant, and spindle subsystems. Assumptions in performing RAM analysis are TBF data and TTR critical subsystems must be Independent and Identically Distributed (IID) by looking at trend analysis and serial correlation. Each critical subsystem is an IID because TBF and TTR data do not have trends and serial correlations. Based on the results of data processing using the RAM analysis method using Reliability Block Diagram (RBD) modeling, at $t = 680$ hours the value of hydraulic reliability (69.14%), coolant (71.35%), spindles (74.53%) and the overall critical system is 36.77%. To achieve 100% maintainability, it takes between 1-17 hours with an inherent availability of 99.49% and operational availability of 98.89%. Based on the evaluation results of IVARA World Class Maintenance Standards Target for Key Performance Indicators, the value of leading indicators and lagging indicators have reached the target.

Keywords: Toshiba machine, Reliability, Availability, Maintainability, RAM analysis, Independent and Identically Distributed (IID), Reliability block diagram.