

SUMMARY

Rizqi Aisyah Kuncaraningrum, Department of Industrial Engineering, Faculty of Engineering, University of Brawijaya, July 2016, *Reliability Analysis of Critical Components and Determination Optimal Inventory of Spare Parts Automatic Sealer Machine (Case Study: CV Bromo Semeru Agro Industri, Batu, East Java)*, Academic Supervisor: Arif Rahman dan Dwi Hadi Sulistyarni.

CV Bromo Semeru Agro Industri is a small industry that has a featured product called apple cider. However, to achieve the demand target, this industry often get problems because of machine failures. Machine failure is common in Automatic Sealer Machine, which has an important role in the production process at the company. So far the industry does not have optimal maintenance system. During this time, to repair component failure are carried out by doing corrective maintenance. So the failure or damage component will be replace without knowing the reliability or the condition of machine.

In this research, reliability analysis of critical components using ABC classification and FBD methods to describe or categorize the component that is include as the critical component. It is the component that found has the highest frequency of failure. This critical component will be calculated optimal inventory value using Economic Order Quantity (EOQ) and Reorder Point (ROP) methods. This study used three distribution of failure, normal distribution, lognormal distribution, and weibull distribution. After knowing the distribution pattern of damage each component, it followed by calculating the value of Mean Time to Failure (MTTF) and reliability values before and after maintenance scheduling applied.

The result of 13 components that have failed from January till December 2015 using ABC classification assessment showed that the critical component contained in automatic sealer machine is Cylinder Cutter, Cylinder Heater, and Cylinder Feeding. Automatic sealer machine have three main blocks, block of power source, pneumatic block, and filler block. In the filler block has a block to move the existing components, that's a heater block. These components will be calculated value of time to failure (TTF) to determine the distribution pattern of failure, then calculate the value of reliability and Mean Time to Failure (MTTF). The reliability of Cylinder Cutter before maintenance is 0,89% becomes 50% with MTTF for 131,54 hours, Cylinder Heater reliability is 5,71% becomes 38,97% with MTTF for 227,7 hours, Cylinder Feeding reliability is 9,18% becomes 35,94% with MTTF for 244,5 hours, Cutter reliability is 18,27% becomes 46,44% with MTTF for 307,78 hours, Heater Catridge reliability is 13,57% becomes 40,9% with MTTF for 405,19 hours, Thermo Couple reliability is 2,94% becomes 38,97% with MTTF for 243,33 hours, Disc Heater reliability is 46,44% becomes 54,33% with MTTF for 696,98 hours, and Spring reliability is 6,43% becomes 48,01% with MTTF for 494,8 hours. Then the EOQ value of Cylinder Cutter is 11 units and ROP is 3 units, Cylinder Heater has EOQ 11 units and ROP is 5 units, and Cylinder Feeding has EOQ 14 units and ROP is 3 units.

Keywords: ABC classification, FBD, MTTF, distribution test, reliability, optimal inventory