DETERMINATION OF PREVENTIVE MAINTENANCE TIME INTERVAL WHICH MINIMIZING COST RATE BASED ON ALLOCATION AND OPTIMIZATION EQUIPMENT RELIABILITY IN MILLING SECTION
(Case study at PT ISM Bogasari Flour Mills Surabaya)

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ABSTRACT

Bogasari Flour Mills, as a company with flour milling as its main business, is one of many divisions of PT. Indofood Sukses Makmur. Milling Department, which is a core process of Bogasari and operating as a continuous process, has a large number of equipment’s downtime for the past several years. From the collected data, the largest number of equipment failures occurred in Milling Section E. Therefore, it is necessary to determine an effective preventive maintenance to improve the reliability of milling equipment. The goal of this study is to determine the preventive maintenance time interval, which could minimizing the cost rate of preventive maintenance based on the allocation and optimization equipment reliability in Milling Section E Bogasari Surabaya.

There were several steps in determining the preventive maintenance time interval which minimizing the cost rate based on the allocation and optimization equipment reliability. The first step was converting downtime data into time between failure data. The best distribution of time between failure data was selected by using the Weibull + +6 software. Furthermore, by using the same software some parameters such as $\mu$, $\sigma$, $\beta$, $\eta$, $\gamma$ and $\lambda$ could be obtained to determine the reliability function ($R(t)$). The next step was to determine the equipment feasibility index required for optimization by using the Analytical Hierarchy Process (AHP) method. The final step was performing optimization to obtain the targeted system reliability by using the non-linear program.

The results shows that the lowest cost rate of preventive maintenance is IDR 10,891,197.00, and obtained when the targeted system reliability of 90% is achieved. With the same system reliability, the longest preventive maintenance interval is owned by the sub-sub system Bran Finisher, i.e. 300.5 hours, and the shortest is owned by the sub-sub system Sifter, i.e. 69.2 hours.

Key words: allocation, AHP, reliability, feasibility index, preventive maintenance time interval