RINGKASAN

NURUL UMI CHAIRA, Jurusan Teknik Industri, Fakultas Teknik Universitas Brawijaya, Oktober 2015, *Perancangan Interval Pemeliharaan Pada Mesin Gerinda Dengan Metode Reliability Centered Maintenance (RCM) II,* Dosen Pembimbing: Oyong Novareza Dan Remba Yanuar Efranto.

PT XYZ merupakan perusahaan yang memproduksi kikir dan mata bor. Mesin gerinda merupakan mesin yang digunakan pada proses *grinding* pada proses pembuatan kikir. Terdapat lima mesin gerinda pada proses pembuatan kikir. Dari data historis, mesin gerinda (GR) 8 memiliki *downtime* tertinggi diantara kelima mesin gerinda yang ada. Perusahaan tidak memiliki jadwal kegiatan perawatan yang jelas, untuk itu diperlukannya analisis penyebab dan dampak dari komponen yang sering mengalami kerusakan dan merancang interval perawatan untuk mesin GR 8.

Functional Block Diagram (FBD) digunakan untuk mengetahui hubungan antar fungsi dari komponen-komponen yang ada pada mesin GR 8. Diagram pareto digunakan untuk memilih komponen yang memiliki pengaruh tertinggi terjadinya *downtime* yang kemudian akan dianalisis lebih lanjut. Untuk menganalisis penyebab terjadinya kegagalan fungsi komponen dan dampak yang ditimbulkan menggunakan metode *Failuure Mode Effect Analysis* (FMEA). Setelah mengetahui penyebab terjadinya kegagalan, dilakukan penentuan jenis kegiatan perawatan berdasarkan RCM II *Decision Diagram.* Kemudian melakukan perhitungan interval perawatan yang optimal dan perancangan RCM II *Decision Worksheet*.

Hasil analisis menunjukkan terdapat lima komponen yang memberikan dampak sebesar 80% terhadap *downtime* yang terjadi pada mesin GR 8, lima kompnen tersebut adalah *dresser hydraulic, hydraulic cylinder, joint for tray*, *main shaft,* dan *eccentric*. Terdapat lima jenis kerusakan komponen dengan jenis kegiatan perawatan *scheduled discard task,* yaitu *dresser hydraulic jammed* dengan interval perawatan selama 2199,96 jam dan keandalan sebesar 38,19%, *hydraulic cylinder jammed* dengan interval perawatan selama 1647,4 jam dan keandalan sebesar 36.94%, *Eccentric mechanism jammed* dengan interval perawatan selama 2213,98 jam dan keandalan sebesar 38,54%, m*ain shaft broken* dengan interval perawatan selama 1068,19 jam dan keandalan sebesar 38,15%, dan perawatan *joint for tray loosening* selama 1238,77 jam dan keandalan sebesar 49,88%. Untuk jenis kegiatan perawatan *restoration task* yaitu *joint for tray playing* dengan interval perawatan selama 755,33 jam dan keandalan sebesar 59,61%, dan e*ccentric mechanism playing* dengan interval perawatan selama 794,31 jam dan keandalan sebesar 44,20%.

Kata Kunci: Keandalan, *Reliability Centered Maintenance (RCM) II,* RCM II *Decision Worksheet*

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SUMMARY

NURUL UMI CHAIRA, Departement of Industrial Engineering, Faculty of Engineering, University of Brawijaya, October 2015, *Design Interval Maintenance On Grinding Machine With Reliability Centered Maintenance (RCM) II*, Supervisor: Oyong Novareza and Remba Yanuar Efranto.

PT XYZ is a company that produces files and drill bits. During the process, five grinding machines occupied in the process of making files. However, it was found that one of the grinding machines, Grinding Machine 8 (GR8), has a serious problem that been seen from the history data. It may because the company does not have a proper maintenance schedule causing it reached the most downtimes compared to the others. This research was doing analyses on the current maintenance activities and prepare a method to solve the problem.

Functional Block Diagram (FBD) was firstly created to describe the relationship between the functioning of components in grinding machine. The next step was creating a Pareto diagram used to select component that having the highest influence to the occurrence of downtime. Following those steps, Failure Mode Effect Analysis (FMEA) was used to analyze the cause of the failure of the function of component and the impact generated. After finding out the causes of the failure, the determination of the type of maintenance activities was formulated by using RCM Decision Diagram II. It followed by calculating the optimal maintenance interval and design of RCM II Decision Worksheet.

The results showed that there were the five most components making more than 80% of the downtimes. There were dresser hydraulic, hydraulic cylinder, joint for tray, main shaft, and eccentric. Five failure function components then classified in a discard schedule task, which were dresser hydraulic jammed with maintenance interval for 2199.96 hours and 38.19 % of reliability, hydraulic cylinder jammed with maintenance interval for 1647.4 hours and 36.94 % of reliability, eccentric mechanism jammed with over 2213.98 hours and 38.54 % for the hours maintenance interval and reliability, respectively. Meanwhile, the main shaft broken and joint for tray loosening at intervals during 1068.19 hours (38.15% reliability) and 1238.77 hours (49.88% reliability), respectively. Besides, two failures function component were classified in restoration schedule task, which were joint for tray playing with maintenance interval for 755.33 hours and 59.61 % reliability, and eccentric mechanism playing for 794.31 hours maintenance interval and reliability of 44.20 %.

Keywords: Reliability, Reliability Centered Maintenance (RCM) II, RCM II Decision Worksheet