

# **ANALISIS SISTEM PERAWATAN PADA MESIN *HYDRAULIC SHEAR TYPE H-2565* MENGGUNAKAN METODE *RELIABILITY CENTERED MAINTENANCE II***

**Ari Fajrin, Suseno**

Program Studi Teknik Industri, Fakultas Sains dan Teknologi  
Universitas Teknologi Yogyakarta

## **ABSTRAK**

CV Anugrah Jaya Sejahtera sebuah perusahaan yang bergerak dalam industri manufaktur *plate working process* (PWP), mempunyai beberapa mesin yang sangat penting bagi jalannya proses produksi yakni seperti mesin *shear, press, sekrup, welding*, gerinda, bubut. Mesin *cutting* yang terdapat diperusahaan ada tiga jenis, ketiga mesin tersebut adalah mesin *cutting Hydraulic Shear H- 3065* (1 mesin), *Hydraulic Shear H-3013* (1 mesin), *Hydraulic Shear H-2565* (1 mesin). Berdasarkan kerusakan periode Januari – Desember 2019 banyak terjadi pada mesin *steel work hydraulic shear H-2565* (72 kerusakan dengan total *downtime* 150 jam). Hasil diagram pareto menunjukkan bahwa mesin Hydraulic Shear H-2565 merupakan mesin yang paling kritis yaitu terhadap komponen *lubrication pump*. Berdasarkan hasil perhitungan *Risk Priority Number* (RPN) diperoleh bahwa nilai RPN tertinggi adalah 504 RPN oleh sebab itu, perlu adanya perhatian khusus pada komponen *lubrication pump* tersebut. Masalah ini diselesaikan dengan menerapkan metode *Reliability Centered Maintenance II* (RCM II) tujuannya adalah dalam rangka untuk menentukan prioritas perbaikan sehingga diperoleh nilai kehandalan terhadap perencanaan waktu penggantian komponen dan minimum *cost* perawatan. Hasil penelitian menunjukkan terhadap penerapan *Reliability Centered Maintenance II* dengan mengaplikasikan LTA, FMEA dan *reliability concept* diperoleh waktu penggantian terhadap komponen kritis *lubrication pump* selama 252 jam dengan perolehan biaya ekonomis Rp. 308.724.698,00 dengan biaya awal sebesar Rp. 364.196.400,00 maka diperoleh penghematan biaya perawatan penggantian komponen *lubrication pump* sebesar Rp. 56.071.702,00.

*Kata Kunci: Maintenance, Reliability, RCM II, dan LTA-FMEA.*

# **MAINTENANCE SYSTEM ANALYSIS ON HYDRAULIC SHEAR MACHINE TYPE H-2565 USING RELIABILITY CENTERED MAINTENANCE II**

**Ari Fajrin, Suseno**

*Department of Industrial Engineering, Faculty of Science and Technology  
University of Technology Yogyakarta*

## **ABSTRACT**

*CV Anugrah Jaya Sejahtera is a company in manufacturing industry for plate working process (PWP), it has some important machines for production process, such as: shear, press, scrap, welding, grinding, and lathe machine. The company has three types of cutting machines. They are cutting Hydraulic Shear H- 3065 (1 machine), Hydraulic Shear H-3013 (1machine), Hydraulic Shear H-2565 (1 machine). Based on the damage period of January – December 2019 mostly occurred on steel work hydraulic shear machine H-2565 (72 damages with 150 hours total downtime). On Pareto Diagram shows that Hydraulic Shear machine H-2565 is the most critical machine toward lubrication pump component. Based on Risk Priority Number (RPN) calculation, it is obtained that the highest RPN value is 504 RPN, thus, it needs special attention lubrication pump component. The problem is resolved by applying Reliability Centered Maintenance II method (RCM II), the purpose is to determine repairmen priority, so that, it was obtained reliability values on component replacement time schedule and minimum cost maintenance. Research result shows that applying Reliability Centered Maintenance II by implementing LTA, FMEA and reliability concept, it was obtained replacement time on critical component of lubrication pump for 252 hours with economical cost as much as Rp 308.724.698,00 with initial cost Rp 364.196.400,00, then the maintenance cost saving of the lubrication pump component is as much as Rp 56.071.702,00.*

**Keywords:** *Maintenance, Reliability, RCM II, and LTA-FMEA.*

## DAFTAR PUSTAKA

- Assauri, S. 1993. *Management Produksi Dan Operasi*. Fakultas Ekonomi Universitas Indonesia: Jakarta.
- Blanchard, B. 2004. *Logistics Engineering And Management sixth edition*, Pearson Prentice Hall : New Jersey.
- Chapman & Hall. 1994. *Total Quality Management 2nd edition, The Key to Business Improvement*. A Peratec Executive Briefing : London.
- Corder, A. 1992. *Teknik Manajemen Pemeliharaan*. Erlangga: Jakarta.
- Dhillon, B. 1997. *Reliability Engineering in System Design and Operation*. Van Nostrand Reinhold Company: Singapore.
- Ebeling, C. 1997. *An Introduction to Reliability and Maintainability Engineering*. The Mc\_Graw Hills Companies: Singapore.
- Faizal, M. 2016. Evaluasi Manajemen Perawatan Dengan Metode Reliability Centered Maintenance (RCM) Ii Pada Mesin Blowing I Di Plant I Pt. Pisma Putra Textile. *Jurnal Teknik Industri, Vol. XI, No. 2*.
- Friatna, Y. 2018. *Analisis Pemeliharaan Mesin Oven Kayu Pada Industri Mebel Studi Kasus Pt Paradise Island Furniture*. Universitas Teknologi Yogyakarta : Yogyakarta.
- Gaspersz, V. 2002. *Pedoman Implementasi Program Six Sigma Terintegrasi dengan ISO 9001:200: MBNQA dan HACCP*. Gramedia : Jakarta.
- Gunawan, H. 2015. Analisis Kegiatan Keandalan Maintenance Pada Mesin Metal Bandsawa Cutting Dalam Penentuan Part Kritis Dengan Pendekatan Metode Reliability Centered Maintenance (RCM) (Pada Universiti Malaysia Pahang Laboratorium Manufaktur). *Prosiding Seminar Nasional Teknik Industri UGM*. Universitas Teknologi Yogyakarta.
- Gupta, G, & Mishra, R . 2018. *Identification of Critical Components using ANP for Implementation of Reliability Centered Maintenance(RCM)*. Life Cycle Engineering (LCE) 69 ( 2018 ) 905 – 90.
- Hendro , A. 2012. *Usulan Perencanaan Perawatan Mesin Dengan Metode Reliability Centered Maintenance (RCM) DI PT. Perkebunan Nusantara VII (PERSERO) Unit Usaha Sungai Niru Kab. Muara Enim*. Universitas Islam Negeri (UIN) Sunan Kalijaga Yogyakarta : Yogyakarta.
- Mitra, A. 1993. *Fundamental of Quality Control and Improvement*. MacMillan Publishing : Singapore.
- Moubray, J. 2000. *Reliability Centered Maintenance II*. Industria Press : New Jersey.
- Nugroho, G. 2013. *Analisis Perawatan Mesin Press Minchang 600 Ton menggunakan Metode Reliability Centered Maintenance (RCM) (Studi Kasus PT. Mekar Armada Jaya Yogyakarta)*. Universitas Islam Indonesia: Yogyakarta.
- Nopendri. A. 2017. Optimalisasi Kebijakan Perawatan Menggunakan Metode RCM(Reliability Centred Maintenance) dan Perencanaan Pengelolaan Suku Cadang Menggunakan RCS (Reliability Centred Spares) Pada Continuous Casting Machine 3 Slab Steel Plant (Di PT Krakatau Steel (persero) tbk ). *e-Proceeding of Engineering : Vol.4, No.2 Page 2916*.
- Prasetyo, C. 2017. Evaluasi Manajemen Perawatan Dengan Metode Reliability Centered Maintenance II Pada Mesin Cutter 1 dan 2 (Di Stasiun Gilingan PG Maritjan Kediri). *Jurnal Rekayasa Vol 10 No 1, hlm. 99-107*.
- Rachman, H, & Garside, A. 2017. Usulan Perawatan Sistem Boiler dengan Metode Reliability Centered Maintenance (RCM). *Jurnal Teknik Industri, Vol. 18, No. 01, pp. 86~93*.
- Rindiyah , A. 2018. Decreasing inventory of a cement factory roller mill parts using reliability centered maintenance method. *Journal of Physics: Series 974 012052*.
- Sayuti, M. 2013. *Evaluasi Manajemen Perawatan Mesin Dengan Menggunakan Metode Reliability Centered Maintenance Pada PT. Z, Jurusan Teknik Industri*. Universitas Malikussaleh: Aceh.
- Stamatis, DH.,1995, *Failure Mode and Effect Analysis FMEA From Theory to Execution*. Wisconsin .ASQC Quality Press: Wisconsin.
- Smith, A. H., & Glenn, H. R. (2004). *RCM Gateway to Work Class Maintenance*. Elsevier Inc : London.
- Yamit, Z. (2001). *Manajemen Kualitas*. EKONISIA, Yogyakarta.