

ANALISIS EFEKTIFITAS MESIN BUBUT MENGGUNAKAN OVERALL EQUIPMENT EFFECTIVENES DAN SIX BIG LOSSES PADA UD LARAS JAYA LOGAM

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ABSTRAK

Dalam proses produksi mesin yang digunakan setiap hari, ditemukan kendala yang mengalami kerusakan berupa kelistrikan motor penggerak, *overheating*, *bearing* dan part sudah aus. Berdasarkan data sekunder terkait total waktu *Total Produktive Maintenance* yang ada pada mesin bubut selama periode Maret 2022 hingga Februari 2023 adalah 124 jam atau 7.440 menit dari jumlah total waktu produksi yang ada. Penelitian ini menggunakan metode *Total Productive Maintenance* dengan analisis nilai *overall equipment effectiveness*. Pengukuran efektivitas mesin dapat diketahui dengan menggunakan metode OEE. Untuk mengetahui kegagalan terbesar dapat diketahui menggunakan *six big losses* untuk memastikan komponen yang menjadi kendala terbesar. Selanjutnya penyebab permasalahan tersebut akan dilakukan analisis menggunakan metode *Failure Mode and Effect Analysis* (FMEA) dengan tujuan mengetahui urutan prioritas dari permasalahan yang terjadi dan yang nantinya dicari cara menanggulangi permasalahan tersebut (improvement) agar tidak terjadi downtime saat proses produksi. Dilakukan analisis dalam penerapan *Overall Equipment Effectiveness* (OEE) yang dilihat dari faktor *availability*, *performance* dan *rate of quality*. Hasil pengukuran efektivitas menunjukkan bahwa rata-rata nilai *availability* 96,2%, *performance efficiency* 92,71%, *rate of quality* 95,02% dengan OEE sebesar 84,71%. Nilai OEE tersebut belum memenuhi syarat standar OEE ideal yakni sebesar 85%. Berdasarkan hasil penelitian, pada UD Laras Jaya Logam terdapat beberapa penyebab rendahnya nilai OEE mesin bubut tersebut, diantaranya yaitu *breakdown time losses*, *setup and adjustment loading time*, *idling & minor stoppage*, *reduced speed*, dan *defects or rework losses*. Tingginya angka *downtime* dan *defect* menyebabkan proses produksi kurang efektif sehingga perlu adanya penjadwalan perawatan mesin dan improvement untuk mengurangi *downtime*.

Kata kunci : *Breakdown*, *Downtime*, *Overall Equipment Effectiveness*, *Failure Mode and Effect Analysis*

ANALYSIS OF LATHE MACHINE EFFECTIVENESS USING OVERALL EQUIPMENT EFFECTIVENES AND SIX BIG LOSSES AT UD LARAS JAYA METAL

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ABSTRACT

In the production process of machines that are used every day, there are problems that experience damage in the form of electrical drive motors, overheating, bearings and worn parts. Based on secondary data regarding the total Productive Maintenance time available on lathe machines during the period March 2022 to February 2023 is 124 hours or 7,440 minutes of the total existing production time. This research uses the Total Productive Maintenance method with analysis of overall equipment effectiveness values. Measuring machine effectiveness can be determined using the OEE method. To find out the biggest failure, you can use the six big losses to determine which component is the biggest problem. Next, the cause of the problem will be analyzed using the Failure Mode and Effect Analysis (FMEA) method with the aim of finding out the priority order of the problems that occur and then looking for ways to overcome these problems (improvement) so that downtime does not occur during the production process. An analysis was carried out in the application of Overall Equipment Effectiveness (OEE) which was seen from the availability, performance and rate of quality factors. The effectiveness measurement results show that the average availability value is 96.2%, performance efficiency 92.71%, rate of quality 95.02% with OEE of 84.71%. The OEE value does not meet the ideal OEE standard requirements, namely 85%. Based on the research results, at UD Laras Jaya Logam there are several causes for the low OEE value of the lathe, including breakdown time losses, setup and adjustment loading time, idling & minor stoppage, reduced speed, and defects or rework losses. The high number of downtime and defects causes the production process to be less effective, so it is necessary to schedule machine maintenance and improvements to reduce downtime.

Keywords: Breakdown, Downtime, Overall Equipment Effectiveness, Failure Mode and Effect Analysis

DAFTAR PUSTAKA

- [1] Anthony, (2020). Analisis Penerapan *Total Productive Maintenance* (TPM) Menggunakan *Overall Equipment Effectiveness* (OEE) Dan *Six Big Losses* Pada Mesin Cold Leveller PT. KPS. *JATI UNIK : Jurnal Ilmiah Teknik Dan Manajemen Industri*, 2(1), 94.
- [2] Fitriadi, dkk (2020). Integrasi *Overall Equipment Effectiveness* (OEE) Dan *Failure Mode And Effect Analysis* (FMEA) Untuk Meningkatkan Efektifitas Mesin Screw Press Di Pt. Beurata Subur Persada Kabupaten Nagan Raya. *Jurnal Optimalisasi*, 4(2), 97-107.
- [3] Frima, dkk (2020). Usulan Penerapan *Total Productive Maintenance* (tpm) Untuk Meningkatkan *Efektivitas* Mesin *Single h*
- [4] Guedesa, dkk (2021). *The role of motivation in the results of total productive maintenance. Production*, 31(2006), 1–14.
- [5] Kulsum, dkk (2020). *Review Produktivitas Mesin Menggunakan Total Productive Maintenance* (Studi Kasus Perusahaan Manufaktur). *Journal Industrial Servicess*, 6(1), 40.
- [6] Kurnia, N. F. (2020). Penerapan *Total Productive Maintenance* (TPM) Dengan Menggunakan Metode *Overall Equipment Effectiveness* (OEE) Dan *Failure Mode And Effect Analysis* (Fmea) Pada Mesin Jahit Toyota LS2-AD140 (Studi Kasus: CV Manggala Glove).
- [7] Meca Vital, dkk (2020). *Total Productive Maintenance and the Impact of Each Implemented Pillar in the Overall Equipment Effectiveness. International Journal of Engineering and Management Research*, 10(02), 142–150.
- [8] Mtsweni, E. S., Dkk (2020). Title. *Engineering, Construction and Architectural Management*, 25(1),1–9.
- [9] Nugroho, A. J. (2017). Evaluasi Gangguan Jaringan Telepon Menggunakan Metode FTA dan FMEA.
- [10] Nurprihatin, F., dkk (2020). *Total productive maintenance policy to increase effectiveness and maintenance performance using overall equipment effectiveness. Journal of Applied Research on Industrial Engineering*, 6(3),
- [11] Pandey, A., dkk (2020). *Implemented the Overall Equipment Effectiveness (OEE) by the techniques of Total Productive Maintenance (TPM) in MSE ' s - A case study. International Journal of Advance Research, Ideas and Innovations in Technolgy*, 5(1), 503–511.
- [12] Prasmoro, A. V., & Ruslan, M. (2020). Analisis Penerapan *Total Productive Maintenance* (TPM) dengan Metode *Overall Equipment Effectiveness* (OEE) pada Mesin Kneader (Studi Kasus PT. XYZ). *Journal of Industrial and Engineering System*, 1(1), 53–64.
- [13] Pratama, D., & Yuamita, F. (2021). Analisis Efektivitas Mesin Jahit Dengan *Overall Equipment Effectiveness* (OEE) Dan *Failure Mode And Effect Analys* (FMEA) (Study kasus : CV. Cahaya Setia Mulia). *JIE. UPY Journal of Industrial Engineering Universitas PGRI Yogyakarta*, 1(1), 23–30.
- [14] Tian Xiang, Z., & Jeng Feng, C. (2020). *Journal of Industrial Engineering and Management Implementing Total Productive Maintenance in a Manufacturing Small or Medium-Sized Enterprise. Journal of Industrial Engineering and Management*, 14(2), 152–175.

