

PENENTUAN INTERVAL WAKTU PERAWATAN PADA MESIN CNC *PLASMA AND FLAME CUTTING* HNC-1500W MENGGUNAKAN *RELIABILITY CENTERED MAINTENANCE* (RCM) STUDI KASUS DI PT BAHAGIA JAYA SEJAHTERA

Akbar, Grita Supriyanto Dewi

INTISARI

Latar Belakang: PT Bahagia Jaya Sejahtera, bergerak di bidang manufaktur mesin pertanian, dihadapkan pada permasalahan produk cacat dan waktu *downtime* mesin yang tinggi. Hal ini disebabkan oleh kompleksitas proses produksi, peralatan yang kurang optimal, dan perluasan kapasitas produksi yang tidak seimbang dengan upaya menjaga kualitas. Mesin CNC *Plasma and Flame Cutting* HNC-1500W menjadi sumber utama permasalahan, mengakibatkan *unplanned downtime* (waktu henti mesin yang tidak direncanakan) dan berakibat pada produk cacat.

Tujuan: Penelitian ini bertujuan untuk melakukan pengukuran terhadap nilai rata-rata *Overall Equipment Effectiveness* (OEE), mengidentifikasi bentuk kerusakan fungsional, menentukan komponen kritis yang memerlukan perhatian khusus, dan menetapkan interval waktu perawatan pada mesin CNC *Plasma and Flame Cutting* HNC-1500W di PT Bahagia Jaya Sejahtera menggunakan pendekatan *Reliability Centered Maintenance* (RCM).

Metode Penelitian: Metode penelitian ini mencakup penggunaan tiga pendekatan utama, yaitu pengukuran *Overall Equipment Effectiveness* (OEE) untuk mengevaluasi kinerja mesin, analisis *Failure Mode and Effects Analysis* (FMEA) untuk mengidentifikasi komponen kritis, dan pendekatan *Reliability Centered Maintenance* (RCM) untuk menentukan interval waktu perawatan optimal.

Hasil: Hasil penelitian menunjukkan bahwa nilai OEE mesin CNC *Plasma and Flame Cutting* HNC-1500W mencapai 71%, dengan nilai *availability* 90%, *performance* 98%, dan *quality* 81%. Komponen kritis yang teridentifikasi adalah *Main Engine* dan *Torch Assembly* dengan nilai RPN 180,53 dan 106,66 masing-masing. Interval waktu perawatan optimal untuk *Main Engine* adalah 93 jam (*Condition Directed*) dan untuk *Torch Assembly* adalah 62 jam (*Condition Directed*).

Kesimpulan: Kesimpulan penelitian ini adalah bahwa penerapan RCM dapat membantu menentukan interval waktu perawatan yang optimal untuk mesin CNC *Plasma and Flame Cutting* HNC-1500W. Interval waktu perawatan yang optimal adalah 93 jam untuk *Main Engine* dan 62 jam untuk *Torch Assembly*. Dengan interval waktu perawatan ini, keandalan dan kinerja mesin dapat ditingkatkan, serta waktu *downtime* mesin dapat diminimalkan.

Kata kunci: Mesin pertanian, Produk cacat, CNC *Plasma and Flame Cutting* HNC-1500W, Perawatan mesin, *Unplanned downtime*.

DETERMINATION OF MAINTENANCE TIME INTERVAL ON HNC-1500W CNC PLASMA AND FLAME CUTTING MACHINE USING RELIABILITY CENTERED MAINTENANCE (RCM) CASE STUDY AT PT BAHAGIA JAYA SEJAHTERA

Akbar, Grita Supriyanto Dewi

ABSTRACT

Background: PT Bahagia Jaya Sejahtera, engaged in manufacturing agricultural machinery, is faced with the problem of defective products and high machine downtime. This is due to the complexity of the production process, less than optimal equipment, and the expansion of production capacity that is not balanced with efforts to maintain quality. The HNC-1500W CNC Plasma and Flame Cutting Machine is the main source of the problem, resulting in unplanned downtime and defective products.

Purpose: This research aims to measure the average value of Overall Equipment Effectiveness (OEE), identify forms of functional damage, determine critical components that require special attention, and determine maintenance time intervals on CNC Plasma and Flame Cutting HNC-1500W machines at PT Bahagia Jaya Sejahtera using the Reliability Centered Maintenance (RCM) approach.

Research Methods: This research method includes the use of three main approaches, namely Overall Equipment Effectiveness (OEE) measurement to evaluate machine performance, Failure Mode and Effects Analysis (FMEA) analysis to identify critical components, and Reliability Centered Maintenance (RCM) approach to determine the optimal maintenance time interval.

Results: The results showed that the OEE value of the CNC Plasma and Flame Cutting HNC-1500W machine reached 71%, with an availability value of 90%, performance 98%, and quality 81%. The critical components identified were the Main Engine and Torch Assembly with RPN values of 180.53 and 106.66 respectively. The optimal maintenance time interval for the Main Engine is 93 hours (Condition Directed) and for the Torch Assembly is 62 hours (Condition Directed).

Conclusion: The conclusion of this study is that the application of RCM can help determine the optimal maintenance time interval for the CNC Plasma and Flame Cutting machine HNC-1500W. The optimal maintenance time interval is 93 hours for the Main Engine and 62 hours for the Torch Assembly. With this maintenance time interval, machine reliability and performance can be improved, and machine downtime can be minimized.

Keywords: Agricultural machinery, Defective products, CNC Plasma and Flame Cutting HNC-1500W, Machine maintenance, Unplanned downtime.