ABSTRAK

Departemen *machining* PT. Kubota Indonesia memiliki 8 *line* yang akan memproses *blank part* dari *sub contractor* yang nantinya menjadi *finish part* dan akan dirakit di departemen *assembling. Line* tersebut yaitu *cylinder head line, gear case line, flywheel line, cylinder liner line, bracket rocker arm line, crankcase OLD line, crankcase NEW line, crank shaft line.* Semua *line* pada departemen *machining* memiliki komponen *tool.* Penggantian *tool* di PT. Kubota Indonesia belum menggunakan penjadwalan, sehingga dapat meningkatkan *downtime*. Frekuensi penggantian terbanyak ada pada *cylinder liner line* yang pada bulan April – Juni 2018 memiliki penggantian sebanyak 1254 unit, selain itu *cylinder liner line* juga memiliki *downtime* tertinggi yaitu sebesar 7243,94 menit. Metode yang digunakan untuk menentukan penjadwalan penggantian *tool* adalah *age replacement* dengan kriteria minimasi *downtime*, metode *availability*, dan metode *reliability*. Metode *age replacement* menentukan umur optimal dimana penggantian pencegahan harus dilakukan sehingga dapat mengurangi *downtime*. Data historis kerusakan *tool cylinder liner line* digunakan untuk menentukan *tool* kritis. *Tool* kritis pada *cylinder liner line* adalah *tool* OP6 H1, OP6 H2, OP2 L3, OP1 L1, dan OP5 B1. Selanjutnya dihitung nilai TTF (*Time To Failure*) dan TTR (*Time To Repaire*), kemudian dilakukan identifikasi distribusi dari tiap *tool*, setelah itu melakukan perhitungan parameter dari distribusi terpilih, melakukan perhitungan MTTF (*Mean Time To Failure*) dan MTTR (*Mean Time To Repaire*). Selanjutnya menentukan penjadwalan penggantian *tool* menggunakan *age replacement* dengan kriteria minimasi *downtime*. Dari perhitungan tersebut menghasilkan penggantian *tool* untuk *tool* OP1 L1 diganti ketika telah beroperasi 200 menit, *tool* OP2 L3 diganti setelah beroperasi 200 menit, *tool* OP5 B1 diganti setelah beroperasi 250 menit, *tool* OP6 H1 diganti setelah beroperasi 200 menit, *tool* OP6 H2 diganti setelah beroperasi 250 menit. Sedangkan total *downtime* sebelum penerapan metode *age replacement* sebesar 3612,636 menit, untuk total *downtime* setelah penerapan *age replacement* sebesar 3240,45. Sehingga terjadi penurunan *total downtime* yaitu sebesar 372,177 atau 10%. Setelah itu dilakukan perhitungan menggunakan metode *availability* pada *tool* kritis, nilai *availability tool* mendekati angka 1 yang berarti semakin baik keadaan *tool* tersebut untuk beroperasi sesuai fungsinya. Dan terakhir dilakukan perhitungan menggunakan metode *reliability* pada *tool* kritis yang didapatkan nilai *reliability* setelah penerapan *age* replacement lebih besar dari sebelum penerapan *age replacement*, dimana semakin tinggi nilai *reliability* suatu *tool* maka semakin kecil pula kemungkinan kerusakan yang akan terjadi pada komponen tersebut.

Kata Kunci: PT. Kubota Indonesia, Tool, Downtime, MTTR, MTTF, Age Replacement, Availability, Reliability.

ABSTRACT

Machining department PT. Kubota Indonesia has 8 lines that will process blank parts from sub-contractors who will later become finish parts and will be assembled in the assembling department. The line is a cylinder head line, gear case line, flywheel line, cylinder liner line, rocker arm line bracket, OLD crankcase line, crankcase NEW line, crank shaft line. All lines in the machining department have tool components. Replacement tool at PT. Kubota Indonesia has not used scheduling, so it can increase downtime. The highest frequency of replacement is at the cylinder liner line which in April - June 2018 has a replacement of 1254 units, besides that the cylinder liner line also has the highest downtime which is equal to 7243.94 minutes. The method used to determine the scheduling of tool replacement is age replacement with the criteria for minimizing downtime, availability methods, and reliability methods. The age replacement method determines the optimal age where preventive replacement must be done so that it can reduce downtime. Historical data damage to the cylinder liner line tool is used to determine critical tools. The critical tool on the cylinder liner line is the OP6 H1, OP6 H2, OP2 L3, OP1 L1, and OP5 B1 tools. Then the TTF (Time To Failure) and TTR (Time To Repaire) values are calculated, then identify the distribution of each tool, then calculate the parameters of the selected distribution, calculate MTTF (Mean Time To Failure) and MTTR (Mean Time To Repaire). Furthermore, determining the scheduling of tool replacement using age replacement with the criteria for minimizing downtime. From the calculation, the tool replacement for the OP1 L1 tool is replaced when it has operated 200 minutes, the OP2 L3 tool is replaced after 200 minutes of operation, the OP5 B1 tool is replaced after 250 minutes of operation, the OP6 H1 tool is replaced after 200 minutes of operation, the OP6 H2 tool is replaced after operation 250 minutes. While the total downtime before the application of the age replacement method was 3612,636 minutes, for total downtime after the application of age replacement was 3240.45. So that a decrease in total downtime is equal to 372,177 or 10%. After the calculation is done using the availability method on the critical tool, the availability tool value approaches 1 which means that the tool's condition is better to operate according to its function. And finally the calculation using the reliability method on the critical tool found that the value of reliability after the application of age replacement is greater than before the application of age replacement, where the higher the reliability of a tool, the smaller the possibility of damage to the component.

Keywords : PT. Kubota Indonesia, Tool, Downtime, MTTR, MTTF, Age Replacement, Availability, Reliability.