ABSTRACT

Maintenance is one aspect that is considered in planning heavy equipment operating costs. In 2021, PT Cipta Kridatama developed a maintenance strategy for hydraulic cylinders in the form of "reseal & rechrome" on the Caterpillar 773E off-highway truck (OHT) unit. This strategy replaces the previous strategy which used a run-to-failure approach. The run-to-failure implementation requires maintenance costs equivalent to the cost of replacing remanufactured components of Rp. 35,934,210 for one Cylinder Group Hoist replacement event. In addition, unscheduled breakdown becomes higher when a system is allowed to work until it is damaged without any precautions.

This study aims to test the effectiveness of the hydraulic cylinder maintenance strategy based on cost and performance of the Caterpillar CAT 773E OHT using run-to-failure and "reseal & rechrome" maintenance strategies. The method used to test the effectiveness of maintenance strategy is the total calculation of the Caterpillar 773E OHT maintenance costs between the run-to-failure and "reseal & rechrome" maintenance strategies. The maintenance cost is calculated until the disposal of the unit or for 54.000 hours meter which is compared between the two hydraulic cylinder maintenance strategies. Another method used is the Overall Equipment Effectiveness (OEE) value approach to test the performance of the Caterpillar 773E OHT in hauling overburden removal activities at PT Cipta Kridatama.

The result of this research is that the maintenance cost of the hydraulic cylinder with run-to-failure is Rp. 832.764.735 and "reseal & rechrome" is Rp. 488.957.582. The average OEE score for Caterpillar 773E OHT with run-to-failure is 18,97% and with "reseal & rechrome" is 20,52%. This shows that the "reseal & rechrome" hydraulic cylinder maintenance strategy is better than the run-to-failure strategy and has been proven to be effective in terms of cost and unit performance.

Keywords: Maintenance Cost, Overall Equipment Effectiveness, Maintenance Strategy, "Reseal & Rechrome"

INTISARI

Perawatan merupakan salah satu aspek yang diperhitungkan dalam melakukan perencanaan biaya operasional alat berat. Pada tahun 2021, PT Cipta Kridatama melakukan pengembangan strategi perawatan terhadap silinder hidrolik berupa "*reseal* & *rechrome*" pada unit *off-highway truck* (OHT) Caterpillar 773E. Strategi tersebut mengantikan strategi sebelumnya yang menggunakan pendekatan *run-to-failure*. Penerapan *run-to-failure* memerlukan biaya perawatan yang setara dengan biaya mengganti komponen *remanufactured* seharga Rp. 35.934.210 untuk satu kali *event* penggantian *Cylinder Group Hoist*. Disamping itu, *unscheduled breakdown* menjadi lebih tinggi ketika sebuah sistem dibiarkan bekerja hingga mengalami kerusakan tanpa adanya tindakan pencegahan.

Penelitian ini bertujuan untuk menguji efektivitas strategi perawatan silinder hidrolik berdasarkan biaya dan performa unit OHT Caterpillar CAT 773E yang menggunakan strategi perawatan *run-to-failure* dan "*reseal & rechrome*". Metode yang digunakan untuk menguji efektivitas strategi perawatan berupa perhitungan total biaya perawatan silinder hidrolik OHT Caterpillar CAT 773E antara strategi perawatan *run-to-failure* dan "*reseal & rechrome*". Biaya perawatan dikalkulasi hingga masa *disposal* unit atau selama 54.000 *hours meter* yang kemudian dibandingkan antara kedua strategi perawatan silinder hidrolik tersebut. Metode lainnya yang digunakan adalah menggunakan pendekatan nilai *Overall Equipment Effectiveness* (OEE) untuk menguji performa dari unit OHT Caterpillar 773E dalam aktivitas *hauling overburden removal* di PT Cipta Kridatama.

Hasil dari penelitian ini diperoleh biaya perawatan silinder hidrolik dengan *run-to-failure* yaitu Rp. 832,764,735 dan "*reseal & rechrome*" sebesar Rp. 488.957.582. Hasil nilai rata-rata OEE OHT Caterpillar 773E dengan *run-to-failure* adalah 18,97% dan dengan "*reseal & rechrome*" sebesar 20,52%. Hal ini menunjukan strategi perawatan silinder hidrolik "*reseal & rechrome*" lebih baik dari *run-to-failure* dan teruji efektif dari segi biaya dan performa unit.