INTISARI

Tingginya *downtime* pada alat berat di sektor pertambangan, khususnya pada unit *articulated dump truck* Volvo A40F, mengindikasikan bahwa sistem perawatan pada komponen kritis masih belum efektif. Salah satu permasalahan utama yang muncul adalah kerusakan pada *engine cooling system* yang berdampak langsung pada penurunan produktivitas unit. Penelitian ini bertujuan untuk merancang strategi perawatan pada *engine cooling system* unit *articulated dump truck* Volvo A40F dengan pendekatan *Reliability Centered Maintenance*. Metode RCM diterapkan melalui tujuh tahapan sistematis, yaitu pemilihan sistem, pendefinisian batas sistem, *Functional Block Diagram*, identifikasi fungsi dan kegagalan, FMEA, *Logic Tree Analysis*, dan *task selection*. Hasil analisis menunjukkan bahwa *hose* merupakan komponen paling kritis berdasarkan nilai RPN tertinggi sebesar 648. Secara keseluruhan, teridentifikasi tujuh komponen utama dengan 20 mode kegagalan. Berdasarkan hasil *task selection*, ditetapkan rekomendasi tindakan perawatan yang terdiri atas 4 tindakan *Time Directed* (TD), 12 tindakan *Condition Directed* (CD), 3 tindakan *Failure Finding* (FF), dan 1 *Run to Failure* (RTF).

Kata Kunci: *Downtime*, *Reliability Centered Maintenance*, Perawatan, *Cooling System*, *Engine*

ABSTRACT

The high level of downtime in heavy equipment within the mining sector, particularly in the articulated dump truck Volvo A40F units, indicates that the maintenance system for critical components is still ineffective. One of the main issues identified is damage to the engine cooling system, which directly impacts the unit's productivity. This study aims to design a maintenance strategy for the engine cooling system of the Volvo A40F articulated dump truck using the Reliability Centered Maintenance. The RCM method is implemented through seven systematic stages: system selection, system boundary definition, Functional Block Diagram, function and failure identification, FMEA, Logic Tree Analysis, and task selection. The analysis result show that the hose is the most critical component, with the highest RPN of 648. In total, seven main components and 20 failure modes were identified. Based on the task selection results, recommended maintenance actions consist of 4 Time Directed (TD) tasks, 12 Condition Directed tasks, 3 Failure Finding (FF) tasks, and 1 Run to Failure (RTF) task.

Keywords: Downtime, Reliability Centered Maintenance, Maintenance, Cooling System, Engine