

INTISARI

Mesin merupakan sistem yang dapat diperbaiki yang mengalami keausan sejalan dengan waktu. Keausan tersebut berdampak terhadap penurunan performa dan peningkatan biaya. Aktivitas overhaul dilakukan untuk mengembalikan fungsi mesin seperti semula. Dalam praktiknya sangat sulit untuk menentukan waktu paling ekonomis untuk melakukan *overhaul*. Oleh karena itu perlu adanya penggambaran model kehandalan dari mesin agar performanya terhadap waktu dapat terlihat dengan jelas. Crow (2006) menunjukkan bahwa titik optimum overhaul akan terjadi pada saat *average systems cost* paling minimum.

Untuk menggambarkan model kehandalan pada *repairable system* digunakan pendekatan *stochastic point of process* yang terkategori menjadi 3 model kehandalan, yaitu Renewal Proses, Non Homogeneous Poisson Process (NHPP), dan General Renewal Process (GRP). Dasar perbedaan model ini adalah faktor restorasi. Penelitian ini menggunakan objek studi mesin dump truck KOMATSU tipe HD7855. Sedangkan untuk memodelkan kehandalan sistem digunakan bantuan piranti lunak weibull++7 dan RGA 6.

Hasil penelitian menunjukkan bahwa hampir 12% unit mengikuti model NHPP dan 88% mengikuti model GRP, sehingga model GRP ini merupakan model terbaik untuk menggambarkan *repairable system*. Rata-rata waktu optimum *overhaul* adalah 21.236 jam dengan standar deviasi 10.392 jam. Variasi waktu optimum terjadi karena banyak potensi faktor yang mempengaruhi seperti kondisi operasional, metode pemeliharaan, kualitas unit, dan kualitas pemeliharaan sehingga hal tersebut dapat dijadikan area pengembangan untuk penelitian selanjutnya.

Kata kunci: *Sistem yang dapat diperbaiki, analisis kehandalan, stochastic point of process, non homogeneous poisson process, general renewal process, optimum overhaul*

ABSTRACT

Engine is a repairable system that will experience wear out phase by time. Wear out will impact on its declining performance and increasing cost. In order to recover engine performance back to its new condition, overhaul activity takes place. In practice, it's very hard to determine the most economic time to overhaul. Because of that reason, we need to depict a reliability model form engine to see its performance clearly time to time. Crow (2006) stated that optimum overhaul point occur when average systems cost is minimum.

Stochastic point of process is used to describe the reliability model of a repairable system. It is categorized into three reliability model, which are Renewal Process, Non Homogeneous Poisson Process (NHPP), and General Renewal Process (GRP). Each model differs by its restoration factor. The object of this research is the engine of dump truck KOMATSU HD7855. In order to obtain reliability model of the system, we use weibull++7 and RGA6 software.

Research result gives 12% of total systems follow NHPP and 88% follow GRP model, so it is obvious that GRP is the best suitable model for repairable system. The research also gives us average optimum overhaul for the engine is 21.236 hour with 10.392 hour standard deviation. The wide variation of optimum time takes place because of several potential factors such as truck's operating condition, maintenance methods and quality, and equipment's quality. Those factors can be analyzed for further research.

Keywords: Repairable system, reliability analysis, stochastic point of process, non homogeneous poisson process, general renewal process, optimum overhaul