

ABSTRACT

This research concern about inventory and maintenance problem at critical spare part in locomotive mechanical system in PT KAI operational area II Bandung. Mechanical system is system that support locomotive upper frame and lower frame. In this research, periodic review approach was used in managing spare part inventory, while maintenance interval is preventive maintenance schedule for spare parts i . The decision variables in this research are maximal inventory level (S) and locomotives maintenance interval (T) with objection function of minimizing total system cost.

This research is generated by developing integration model of inventory and maintenance on critical spare parts in locomotives mechanical system by considering failure rate, deterioration rate, and imperfect preventive maintenance. The failure rate in this research are assumed to be normal distribution, deterioration are assumed to be normal distribution and linearly also stationary, Imperfect maintenance which has probability $0 \leq P(Z) \leq 1$.

The integration of inventory and maintenance in this research was solved by analytic model with PSO algorithm and resulted a better solution. In the case of inventory and maintenance by considering failure rate, deterioration rate, and preventive preventive maintenance will order critical spare part at $(T - \tau)$ with the maximum nventory level (S) that will receive at (T) . At time (T) the number of critical spare part will be reduce due to corrective maintenance and preventive maintenance that affect number of critical spare part after preventive maintenance defined as (S_a) .

For future research can consider both demand and stochastic lead time. Multi echelon and transport consideration are interesting and combined other algorithm, such as genetics algorithm and tabu search algorithm also be further research.

Keywords : periodic review, failure rates, total system cost, PSO algorithm