ABSTRACT

One of the factors that determine production process will run in a good condition or not is the condition of machines or facilities used. To get the machine condition which always ready to run its function better, needed the maintenance activity, which can in the form of Preventive Maintenance or Corrective Maintenance. In this maintenance activity, spare parts is needed, because generally the damage of machine caused by the damage of its component. In this case, spare part inventory supports the maintenance activity, and need the careful calculation from company to get an optimal inventory as will be conducted in this Final Project. Optimal here mean the inventory costs as minimum as possible and its availability is maximum so that support the production process.

This Research started from identifying critical component using ABC Classification and AHP Approach, then from existing component failure data, estimated the failure distribution and its parameter. Then, an optimal inventory calculation to each every critical component is conducted. In this case, the Continous Review Model is used, which demand distribution is Eksponensial (Time Distribution Of The Component Failure). Afterwards, the calculation of optimal interval of preventive replacement which minimize total failure replacement cost is conducted, using the support of Golden Suction Method.

The result of ABC Classification is 14 critical component (Class A), but because this result is inappropriate in the practise, AHP Approach is used to determine the critical component by 5 criteria, that is : urgency (0.471), Lead Time (0.268), Import / local (0.143), usage frequency per year (0.075) and component price (0.044). With this AHP Approach got 11 critical component, which then the inventory is analysed to get Q* and r*. Hereinafter conducted the calculation of interval of preventive replacement and got the value of tp* that larger than the value of MTTF.

Keyword : ABC Classification, AHP, reliability, Continuous Review, Preventive replacement, Golden Section Method.