

ABSTRACT

Railroad is one of the most important component in railways transportation in Indonesia. In order to support the railways transportation, the rail must be in a good condition and quite good reliable to minimize failure on those component. To assure the rail is reliable enough, so there is a need for an optimum number of inspection. So the inspection will determine that the rail is quite reliable to operate, but quite low in cost. Then also a need for periodic renewal for the component, to ensure the reliability level of the component and maintain the level of cost quite low.

In order to determine the optimum number of rail inspection, the risk based inspection method is performed. The statistical distribution of each failure mode must be identify to determine the reliability level and failure rate of the component. Using data obtained from the statistical distribution, the number of inspection will determined based on number of cost for each inspection, repair, and failure. Life cycle cost method performed to determine the renewal policy for the component based on economic life limit,

Based on the data calculation, the inspection for each rails types are obtained. For rail R.54 the optimum number of inspection in every six months, and rail R.42 in every twelve months, and number of cost are Rp564.345.868.124 and Rp24.402.481.049 for each type or rails. After the number of cost are obtained, the economic life limit used to determine the maximum lifetime for each rails, which is the maximum lifetime for each rails are fourty five years.

The rail R.54 still have twenty two years remaining life with number of sustaining life cycle cost are Rp 138.829.266.589. For rail R.42, the renewal policy must be perfomed because the maximum lifetime has been elapsed. For the next research are expected to using the data with the exact number of crack and failure for each failure mode, so the better preventive maintenance could be performed.

Key words: Risk based inspection, Life Cycle cost, rail inspection.