

Abstract

This research states the problem with doing inspection and maintenance in a cost optimal way. This is needed to find an optimal balance between the number of inspections and the number of resulting failures. First a method is developed to find which subsystem within a system requires the most attention, based on multiple criteria. Second, after finding this subsystem this research tries to find the most critical components for that subsystem, in a way they are determining the optimal inspection interval. Based on the failure data retrieved from these critical components the research comes up with a model that expresses reliability and availability of comprehensible systems into cost. The model tries to find the optimal inspection interval from empirical research. It does this with only data available on how the inspection interval is in the current situation. The model is tested with data from an actual subsystem of a train series at the maintenance company of the Dutch Railway Carrier NS (NedTrain). Most maintenance companies have their inspection interval for a particular system based on reliability data from the manufacturer. This data does not necessarily match with the actual reliability of a system and the inspection intervals are not necessarily at a cost optimum. This research retrieves the actual reliability data and combines this together with the availability of a system to find the optimum inspection interval in terms of costs. There is an optimal offset in doing zero or an infinite amount of inspections if reliability and availability are taking into consideration. This research developed a model to find this optimum based on costs and therefore can save a railway carrier a considerable amount of money.