Cost Oriented Failure Consequence Analysis of Machine Components- A Case Study

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Abstract

Failure Mode and Effect Analysis (FMEA) is a methodology used for product and process design, by identifying the potential failure modes and prioritizing them, subsequently reduce the error in the process. The failure consequence is quantified in terms of Risk Priority Number (RPN), a product of occurrence, severity, and detection difficulty. This approach to FMEA lacks the quantification of costs of potential occurrence of specified failure modes and costs of their analysis. In manufacturing, the RPN measurement provides little or no meaning as the failure quantification on the basis of cost may be more meaningful. This paper describes the modification to the methodology of FMEA process in a cost-oriented manner, which takes into account the economic aspects of potential failure of the machine component. Three consequences of the failure of components are considered; failure will result in conditions where machine is immediately stopped (F1), leads to reduction in speed (F2) and affecting product quality (F3). Expected annual cost index based on the failure consequence is calculated to identify the criticality of the components. An application of the cost oriented FMEA is presented for a press machine manufacturing auto components.

Keywords
FMEA, Cost basis, Failure consequence, Critical components.

Biographies

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