

Risk management in automotive manufacturing process based on FMEA and grey relational analysis: A case study

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ABSTRACT

Risk management is an important issue in manufacturing companies in today's competitive market. Failure modes and effects analysis (FMEA) method is a risk management tool to stabilize production and enhance market competitiveness by using risk priority numbers (RPN). Although the traditional FMEA approach is an effectively and commonly used method, it has some shortcomings such as assumption of equal importance of the factors, severity, occurrence and detectability, and not following the ordered weighted rule. Thus, in order to improve RPN, an integrated method combining grey relational analysis (GRA) with FMEA is used in this study. The purpose of this paper is to contribute to risk management activities by proposing solutions to assembly line problems in an automotive manufacturing company by using combined GRA and FMEA method. In the proposed method, the priorities of production failures were determined by GRA approach and these failures were minimized by using FMEA technique. The study results indicated the actions that lead to enhancement in the product. The implementation of corrective/preventive activities resulted in 96 % improvement in door seal cuts problem caused by the door step assembly. Door seal cuts problem caused by instrument panel assembly and the noisy door window problem are solved completely.

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