Potentiating the Risk Assessment in Failure Mode and Effect Analysis (FMEA). One Approach to Determine Critical Failure Modes by Analytic Hierarchy Process (AHP)

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Abstract

Our current world is governed by a comparative and competitive society, which makes it imperative to be more efficient and reliable; in a parallel way, the organizations translate this initiative demanding higher failure prevention levels in its operations; in this way it becomes possible to reduce the error elements in the analyzed systems, and therefore the contribution to minimize the risk of occurrence of the failure modes in the sub-systems is reached, a situation that definitely supports the safety and the final profitability in the organizations. Failure Mode Effect Analysis (FMEA) is a methodology widely proven in different fields of industry as a powerful tool for analysis, control and prevention of failures in a given system. Additionally, FMEA defines the level of criticality of failure modes analyzed from assessed risk level, which by certain conditions of similarity between failure modes may require greater consistency in their methodology to clearly differentiate the risk levels assessed. The purpose of this article is to provide an alternative risk assessment that addresses this need through on the use of a model based on Analytic Hierarchy Process (AHP), which is the responsible method to prioritize the risk priority number (RPN) for each failure mode assessed; allowing identify the most critical ones in the system, and will ultimately be the basis for strengthening the investment decision in favor of improving the reliability of the entire system.

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