

Failure Mode Effect and Criticality Analysis Based Maintenance Planning through Traditional and Multi-Criteria Decision Making Approach for Aluminium Wire Rolling Mill Plant

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Abstract : This paper highlights comparative results of traditional FMECA and multi-factor decision-making approach based on "Technique for Order Preference by Similarity to Ideal Solution (TOPSIS)" for aluminum wire rolling mill plant. The suggested study is carried out to overcome the limitations of FMECA by assigning the scores against each failure modes in crisp values to evaluate the criticalities of the failure modes without uncertainty. The primary findings of the paper are that sudden impact on the rolls seems to be most critical failure cause and high contact stresses due to rolling & sliding action of mesh to be least critical failure cause. It is suggested to modify the current control practices with proper maintenance strategy based on achieved maintainability criticality index (MCI). The outcome of the study will be helpful in deriving optimized maintenance plan to maximize the performance of continuous process industry.

Keywords : reliability, maintenance, FMECA, TOPSIS, process industry

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