

Management of Maintenance using FMEA model: Case study of Road headers (Alpine miners AM50)

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Abstract

As maintenance cost is determinant in production cost, maintenance manager should allocate appropriate maintenance that reduces spending. FMEA model “Failure mode, effect and Criticality analysis” is the most useful tool. It combines a theoretical process, experts’ knowledge and historical data of the equipment performances.

This paper proposed a case study based on FMECA’ implementation applied to mining machines (Road-headers AM50) used in cutting, loading rock phosphate and building roadways in underground mining of phosphate.

A survey has been conducted based on five years of performances of these machines. Failures of each compound have been classified by type and range of frequency of occurrence, criticality and degree of detectability. A qualitative survey has been also gathered from maintenance staff. The risk associated with the potential failure modes was calculated through the Risk priority number RPN.

Therefore, data outcome is new maintenance policy that determines worst failure mode and assesses improvement given.

Keywords

Maintenance, F.M.E.A, Reliability.

Biography

Lalla Samira Touhami is a PhD Student at Laval University in industrial and mechanical Department. She earned engineering Diploma in mechanic engineering, specialized in Control, quality and maintenance of systems, at ENSEM high school of mechanical and Electrical engineering, in 1996. She completed his M.sc (mechanic applied to construction) at the same institution in Morocco in 2000. She also was professor at ESITH, high school of textile engineering from 2000 to 2010. She has over than 10 years of experience in reliability, maintenance and safety systems for engineer student education. She designed and taught courses on quality engineering, reliability and maintenance for undergraduate, graduate, and professional engineers in Morocco. She supervised masters and engineer students in their industrial project. She developed collaboration between Laval University and ESITH institution. Her research interests include Maintenance management and decision-making aid tools.

Daoud Ait-Kadi is currently a full professor at mechanical engineering department and director of graduate studies in industrial engineering at Laval University in Canada. He received his Bachelor’s degree in mechanical engineering in 1973, a Master of Science in industrial engineering in 1980 and a Ph. D. in industrial engineering, operation’s research and computer science in 1985. His research interests include production and operations management, reliability engineering, maintenance management, life cycle engineering and reverse logistics and spare parts management. He has authored many papers published in IEEE transactions on reliability, naval research logistics, IJPR, IJPE, RESS, EJPR, and JQME. He coauthors a textbook on stochastic processes (2004) and a Handbook of maintenance management and engineering (2009). He is currently involved in many industrial projects in automotive, aerospace, telecommunications, forest products and food industries. He is a senior member of IEEE and IIE. He is also a resident member of Hassan II Academy of sciences and technology (Morocco).

Hassan Hamri is mechanical engineer, graduate from EMI, Mohamedia school of Engineers in morocco since 1992. He holds a MBA in business and administration from Akhawayn University in Morocco in 2002. He was Engineer in Reliability and maintenance department for a long time of mining equipment. He developed more than 15 year's maintenance experience in Reliability and Failure Analysis. He also directed spares part department in mining industry. Several contributions in collaboration between industry and academic project have been conducted. Now, he is director of partnership department of OCP Group Company in Morocco and focus on partnership analysis with international market.