Analysis of Reliability of Mining Shovel Using Weibull Model

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Abstract : The reliability of the various parts of electric mining shovel has been assessed through the application of Weibull Model. The study was initiated to find reliability of components of electric mining shovel. The paper aims to optimize the reliability of components and increase the life cycle of component. A multilevel decomposition of the electric mining shovel was done and maintenance records were used to evaluate the failure data and appropriate system characterization was done to model the system in terms of reasonable number of components. The approach used develops a mathematical model to assess the reliability of the electric mining shovel components. The model can be used to predict reliability of components of the hydraulic mining shovel and system performance. Reliability is an inherent attribute to a system. When the life-cycle costs of a system are being analyzed, reliability plays an important role as a major driver of these costs and has considerable influence on system performance. It is an iterative process that begins with specification of reliability goals consistent with cost and performance objectives. The data were collected from an Indian open cast coal mine and the reliability of various components of the electric mining shovel has been assessed by following a Weibull Model.

Keywords : reliability, Weibull model, electric mining shovel
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