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Reliability analysis of mining equipment: A case study of a crushing plant at Jajarm Bauxite Mine in Iran

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Abstract

The performance of mining machines depends on the reliability of the equipment used, the operating environment, the maintenance efficiency, the operation process, the technical expertise of the miners, etc. As the size and complexity of mining equipments continue to increase, the implications of equipment failure become ever more critical. Therefore, reliability analysis is required to identify the bottlenecks in the system and to find the components or subsystems with low reliability for a given designed performance. It is important to select a suitable method for data collection as well as for reliability analysis. This paper presents a case study describing reliability and availability analysis of the crushing plant number 3 at Jajarm Bauxite Mine in Iran. In this study, the crushing plant number 3 is divided into six subsystems. The parameters of some probability distributions, such as Weibull, Exponential, and Lognormal distributions have

been estimated by using ReliaSoft's Weibull++6 software. The results of the analysis show that the conveyer subsystem and secondary screen subsystem are critical from a reliability point of view, and the secondary crusher subsystem and conveyer subsystem are critical from an availability point of view. The study also shows that the reliability analysis is very useful for deciding maintenance intervals.



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Keywords

Reliability analysis; Availability; Mining equipment; Reliability importance measures

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