



The reliability assessment of coal mine scraper conveyer flight link

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Abstract

Flight link is the cargo traction part of the flight conveyer. It needs to overcome much friction resistance and bear heavy loads during working, which requires high strength, fine malleability and good wear resistance. So the reliability of the flight link is more important to the safety and efficient transportation of the flight conveyer. Factors that affect the reliability of coal mine machinery are various, including inherent reliability and the use reliability. These reliabilities contain many influencing factors of multi-level and uncertain. In order to resolve the problem of the reliability assessment of flight link with many appraisal factors and hard to quantify. This paper applies the system level gray correlation analysis theory to the reliability appraisal of the flight link, and then it has been established the appraisal index system of the reliability of colliery machine components. Using the model of system level gray correlation analysis, three flight links were appraised to provide policy-maker and the user the correct appraisal conclusion, to guarantee coal mine enterprise's security and highly efficient production.

1. Introduction

The coal mine is the national energy base, which has the pivotal status in the national dividend. In recent years, as a result of the history, the environment and the artificial reasons, the coal mine enterprise accidents frequently happened, which has brought huge economic loss to the country, and brought the fatal threat to people's life. The security problem already surpassed the economic efficiency and become the most important question in the middle coal mine production, because the coal mine machinery's excess load movement. It creates the varying degree to the entire mine pit's safety in production, and

causes significant or especially big coal mining. Therefore, we must carry on the examination, the analysis and the appraisal regularly to the coal mine machinery's reliability, and adopt the measure to stop accidents effectively and positively.

1. 1. Establishment of the appraisal index system of flight link

According to the design manufacture level and the use of flight link, appraisal system is divided into inherent reliability and the use reliability, as reference (Wang *et al.*, 2004) The inherent reliability includes design level, manufacture level, material quality level and the performance of the equipment. And the use reliability