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## 基于AHP-FCE的煤矿通风系统可靠性评价研究(PDF)

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Title: AHP-FCE based reliability assessment of coal mine ventilation system

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关键词: 煤矿通风系统; 可靠性; 评价指标; 层次分析法; 模糊综合评价法

Keywords: coal mine ventilation system; reliability; evaluation index; analytic hierarchy process (AHP); fuzzy comprehensive evaluation method (FCE)

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摘要: 基于事故致因理论及可靠性原理,结合煤矿通风系统的特点,从"人-机-环"三个方面构建了煤矿通风系统可靠性评价指标体系,并采用层次分析法确定各评价指标权重值;对煤矿通风系统可靠性进行了分级,采用专家打分法确定各评价因素的隶属度,用模糊综合评价法判定煤矿通风系统可靠性;以王坡煤矿为例,依据构建的评价指标体系,采用二级模糊综合评价法对其通风系统可靠性进行了评价,结果表明:该矿通风系统可靠性安全等级为"较好".研究结果可为通风系统设计、防止和减少矿井通风系统事故、保障矿井通风经济合理等方面提供理论依据和技术支持.

Abstract: Based on the accident-causing theory and reliability principle and combined with the characteristics of coal mine ventilation system, the reliability evaluation index system of coal mine ventilation system was established from three aspects of human-machine-environment, in which the weights of the indices were determined using analytic hierarchy process(AHP). The reliability of the coal mine ventilation system was classified by its membership degree determined by the expert scoring method, and the reliability of coal mine ventilation system was evaluated through fuzzy comprehensive evaluation (FCE) method. With the example of Wangpo Coal Mine and the established evaluation index system, the reliability of the ventilation system was evaluated using the second fuzzy comprehensive evaluation method. Results show that the safety grade of the coal mine is good. The research could provide theoretical foundation and technical support for accident prevention and reduction from coal mine ventilation system, ventilation system design, economic rationality of mine ventilation, and so on.

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