The effect of technical parameters of cross-measure boreholes methane drainage method on the amount of exhaust gas
(Case study: Tabas Parvadeh coal mine No.1)

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Keywords	*Engkish Extended Abstract*

Summary

This research deals mainly with the degassing method with cross-measure boreholes in the longwall mining method. Determining the appropriate values of different parameters of methane drainage boreholes is necessary to increase efficiency. These parameters include the length of the methane drainage boreholes, the angle of the boreholes relative to the axis of the tailgate, and the inclination of the boreholes. Accordingly, the analysis of operational data obtained from the methane drainage of the E4 panel has shown that with increasing the dip of the panel, the angle of boreholes relative to the axis of the tailgate should be considered less. Also, typically, the exhaust gas flow of methane drainage stations starts to increase at a distance of 15 to 25 meters from the edge of the face, so the length of methane drainage boreholes should not be considered more than 45 meters.

Introduction

Cross-measure boreholes method involves drilling boreholes from the tailgate to a stress-free area in the roof and floor layers of a working seam of coal. To prevent methane from entering the work area or reducing the amount of gas entering, it is necessary to perform methane drainage in this area. After specifying this area, the parameters of methane drainage boreholes can be specified. These parameters include the distance between the degassing stations, the angle of the drainage boreholes to the horizon, the angle to the longitudinal axis of the upper corridor, and the length of the drainage boreholes. Therefore, the main purpose of this paper determines the appropriate value of cross-methane drainage borehole parameters to increase the amount of removed gas from each borehole by analyzing operational data.

Methodology and Approaches

To determine the appropriate values of the parameters of methane drainage boreholes in the cross-measure boreholes method, data from 67 methane drainage stations including 280 boreholes drilled in the E3 panel and 68 stations containing 152 boreholes in the E4 panel were collected. These data include the length of the boreholes, the angle to the axis of the upper corridor, the dip of the borehole, the distance between the stations, and the amount of exhaust gas from each station and borehole in cubic meters per minute. The collected data had been analyzed using Minitab and Excel software.

Results and Conclusions

The steeper the dip of the coal seam, the more the boundary of the methane disposal area tends to the tailgate. As a result, the angle of methane drainage boreholes relative to the tailgate axis should be considered less. Reducing the distance of gas stations from 18 to 22 meters to about 9 to 12 meters leads to an increase in exhaust gas from the stations. The discharge of the stations starts to increase at a distance of about 15 to 25 meters from the edge of the face, so considering the boreholes angle and other parameters it is suggested that the length of the boreholes be between 35 and 45 meters.