



## **Influence of Geological Structure on Coal and Gas Outburst Occurrences in Turkish Underground Coal Mines**

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Coal and gas outbursts are sudden and violent releases of gas and in company with coal that result from a complex function of geology, stress regime with gas pressure and gas content of the coal seam. The phenomena is referred to as instantaneous outbursts and have occurred in virtually all the major coal producing countries and have been the cause of major disasters in the world mining industry. All structures from faults to joints and cleats may supply gas or lead to it draining away. Most geological structures influence the way in which gas can drain within coal seams. From among all the geological factors two groups can be distinguished: parameters characterising directly the occurrence and geometry of the coal seams; parameters characterising the tectonic disturbances of the coal seams and neighbouring rocks. Also dykes may act as gas barriers. When the production of the coal seam is advanced in mine working areas, these barriers are failed mostly in the weak and mylonitized zones. Geology also plays a very important role in the outburst process. Coal seams of complex geological structure including faults, folds, and fractured rocks are liable to outbursts if coal seams and neighbouring rocks have high gas content level. The purpose of the study is to enlighten the coal industry in Turkey to improving mine safety in underground coal production and decrease of coal and gas outburst events due to increasing depth of mining process. In Turkey; the years between 1969 and 2013, the number of 90 coal and gas outbursts took place in Zonguldak Hard Coal Basin in both Kozlu and Karadon Collieries. In this study the liability to coal and gas outburst of the coal seams are investigated by measuring the strength of coal and the rock pressure. The correlation between these measurements and the event locations shows that the geological structures resulted in 52 events out of 90 events; 19 events close to the fault zones, 25 events thorough the fault zones and 8 events in the zones where sudden changes of inclination and/or thickness of the coal seam.