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Causes and Consequences of Accidents at Coal Mines

Thousands of miners die because of mining accidents each year, especially in the processes of coal mining. The greatest danger during development of coal deposits is working out outburst formations. During mining operations sudden outbursts of coal and gas occur in sewage and all kinds of preparatory faces, but they are the most intensive in mine workings penetrating a bed. From 1906 to 2002 there were recorded 216 emissions in such faces. Main emissions occurring while penetration (83 %) are in steeply inclined layer in the Central Donbas, others – at sloping (4%) and flat (13%) seams in other areas of the basin. Emissions are especially intensive at the faces while penetrating in the area of geological faults.

Because of the deficiency of coal reserves with safe geological conditions in the country, Ukraine cannot stop resource recovery prone to sudden outbursts, with high gas content and dust exposure, as well as thin layers with tectonic faults and weak rock walls. In recent years, almost after every major accident, State Service of Mining Supervision and Industrial Safety tightened measures to comply safety standards. Since November 2000, the mines with increased danger were put on hold before the complete elimination of ventilation violations, dust-gas mode, with the equipment with automatic methane control in use. Settling coal dust with powdered slate was used to increase explosion protection at 25 mines along with other measures. Dynamics of total and fatal accidents (from information materials of State Service of Mining Supervision and Industrial Safety) shows that the number of accidents tends to decrease.

From 1990 to 2008 in Ukraine there were 34 accidents of first category (with 5 and more fatally injured), mainly in the explosions of gas and coal dust, including: coal outburst and gas - 3, fires - 2 cases. As a result 774 miners died.

The most serious accident in the history of the Ukrainian coal industry which occurred at the mine after A. F. Zasyadko on November 18th (and on 1st and 2nd December) in 2007 was the result of an explosion involving methane air mixture, coal dust in mine workings at gallery level 1078 m deep. Expert Commission revealed many violations of the safety rules. Particularly, when CH₄ congestion was above the threshold, gas controlling equipment was absent, and the cable of hoisting machine was installed with defective contact to the actuator, thus resulting in the explosion of the coal dust and methane air mixture.

According to the International Energy and Miners Organization, annually each million of extracted coal Ukraine is “paid” by lives of two miners.