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STABILIZATION DEVELOPMENT WORKINGS AT INDIVIDUAL DIVISION "E. T. ABAKUMOV MINE" OF STATE ENTERPRISE "DONETSK MINING ENERGY COMPANY"

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At working off of bench coal at deep mines of Donbass one of the most expensive mechanisms is maintenance of the development workings stability supported in a coal-face work influence zone.

The condition of containing strata is influenced with numerous factors which can be divided into two groups: natural and technical.

In the course of conducting developments and coal-face works in most cases there is no possibility to operate natural factors; it is necessary to adapt, soften or compensate their harmful influence.

The group of technical factors includes a complex of technological, technical and organizational decisions which are accepted and realised according to the passport or specifications of conducting those or other mining operations.

All these decisions are subject to the mining engineer who can choose, alter, combine and improve them. Hence, not excluding importance of the account of natural factors the basic management of a condition of rocks surrounding mine working is carried out by a choice separately or combinations of rational technical and organizational decisions.

High-efficiency working of longwalls, especially in difficult conditions of deep mines, should be provided, as a rule, without performance in local preparatory mine working of the repair-regenerative works, which are considered to break coal-extraction technology.

Conducting and maintenance of district development workings make the big share of expenses in the coal mining production. Reduction of their quantity for one

working stope is one of essential reserves of labour productivity increasing and production costs reduction.

The effectiveness of entry protection should be defined by means of the technical-economical analysis[1].

Individual division “E. T. Abakumov Mine” of state enterprise “Donetsk Mining Energy Company” is determined as the baseline enterprise of the fuel and energy industry of Ukraine as for modernization and new technologies intrusion. Now the reconstruction of mine is being conducted and in the long term on commissioning when complementary stopes are launched the expectancy of mine production will be 1,500,000 tons per year.

On mine balance there are reserves of coal series – m_6 , m_5 , m_3 , m_2 , l_8 , l_7 , l_6 , l_4 , l_3, l_1 , k_8, are prepared - m_3 , m_5. Within existing borders of a mine field commercial coal deposits make 84.1 million tons of rank of coal – Д, ДГ, Г, Ж, which is enough for mine work within 100 years. Besides, it is possible to increase probable resources of fields “Abakumovsky-deep” of 122.6 million tons.

The mine is known for a gas factor is leveling as supercategory, because of during produce mining from a seam roof in the tectonic disturbance zones are detect blower. All bench coal in borders of a mine field is not outburst hazard. Coal series is dangerous on dust explosibility and is not breedling-fire. The research sandstone sunk formation to outburst hazard degree is low and average.

In the tectonic relation the deposit is characterised by rather quiet burial complicated by some of fissures: thrusts, downthrows. Amplitude of failures small - from 5 to 13 m. The geothermal conditions are complicated. The rocks maximum temperature is 34,3 °C. The mine working development in the aleurolites and sandstones rocks is silicosis hazard.

Extent of supported mine working is 8-14 km.

Mine-take development is panel system and sequence of mining is downward along the strike with pillar system mining use.

Now mine has financial stress and not enough resource for mine development, so for the future working 8th west longwalls seam m_3 is advance mining with stowing face, that is technically ineffective, but economical.

Two driving methods are used: drilling-and-blasting and with heading machine. For drivage in-seam working they use modern heading machine: П110 and КСП-32 together with belt loader: АПЛ-1к, ПТК, УПП on various type.

Mine district working support is make to using arch support: КМП-А3, КМП-А5 and АП-30 together with supporting block 1.1-2.0 m on plan area 13.8-21.2 m^2 from special-section type СВП-27 and СВП-33 with step of a support setting 2 item on 1 m.

Nowdays the coal seam m_3 of rank ДГ on depth of 860 m is being developed. During drivage out of 8th east belt entry seam m_3 by visual supervision and instrumental measurement it has been detected that the rock floor heaving in drift begins on distance of 20-25 m after a heading. Average speed of a floor heaving – 0.15-0.2 m per month (Figure 1).

Geological prospecting wells given on structure of rock mass: the main roof is consist of aleurolite t=4.4-9.9 m; σ_c=40-60 MPa, an immediate roof: argillite – t=7.0-10.3 m; σ_c=20-40 MPa, a coal seam – t=0.9-1.1 m; σ_c=15-18 MPa, immediate floor is differently strata: aleurolite – t=1.2-1.9 m; σ_c=40-60 MPa, chalkstone – t=0.1-0.4 m; σ_c=100-120 MPa, aleurolite – t=1.0-3.3 m; σ_c=40-60 MPa, the main floor also differently strata: argillite – t=2.0-3.5 m; σ_c=20-40 MPa, sandstone – t=0.4-1.0 m; σ_c=60-80 MPa, aleurolite – t=2.5-6.5 m; σ_c=40-60 MPa. So seam roof is medium and high resistance cavability and seam floor have different strata of rock heaving. The pitch angle of adjacent strata - 9 degrees.

Figure 1 – Nature of look of a rock floor heaving in 8th east belt entry seam m_3

Traditionally accepted method of rock heaving control on mine is the ripping of floor rock at once after drivage, because of mine working after formal acceptance, does not meet safety rules requirements, and after all it operation, during the currency mine working need to do some more rippings.

Practice of roadway maintenance in the conditions of periodic bottom rippings demonstrates that already after 2-3 rippings, it needs retimbering of mine roadway.

It is known that any structural features of a rock mass, adjacent strata physicomechanical properties, depths of their stratification, mining conditions, it all influential factors over progressing of a rock heaving[2]. All scientists who study the reasons of a rock heaving and physicomechanical processes, originating round a mine working, obtain understanding that one of principal causes of rock deformations, is the enhanced rock pressure and presence of the exposed floor, so, propose a hypotheses and ways of solution of this problem. However experimental check of ways was effected in concrete geotechnical conditions, but not all of them are effective for other it conditions.

Substantial contribution to intensification of activity process floor heaving, because of miss pressing on floor rocks of weight ripping rocks removed, so mucking at a ripping decrease passive rebuff on roadway floor. By results of researches [3] in the

conditions of mine “Trudovsky” ripping did not loss process but only some decrease intensity of rock heaving, herewith displacement augmented of roof rocks, or in the another conditions of mine “Juzhnodonbassky №3” the ripping have essential effect on displacement of floor rocks and speed up process in ~7 times, than before a ripping[4].

So, for maintenance of floor stability mine working after a ripping and prevention of iterate squeezing of floor rocks first of all need to compensate rebuff of mucking by pressure force to roadway floor.

Two alternatives of mechanical way of prevention of squeezing to floor rocks of rebuff was conducted by S. G. Negrej [5,6]: use of a arch legs join by flexible crosstie coupled cable ropes (Figure 2A) and lay cross floor bars between arch legs its end parts shoring on two upright (Figure 2B).

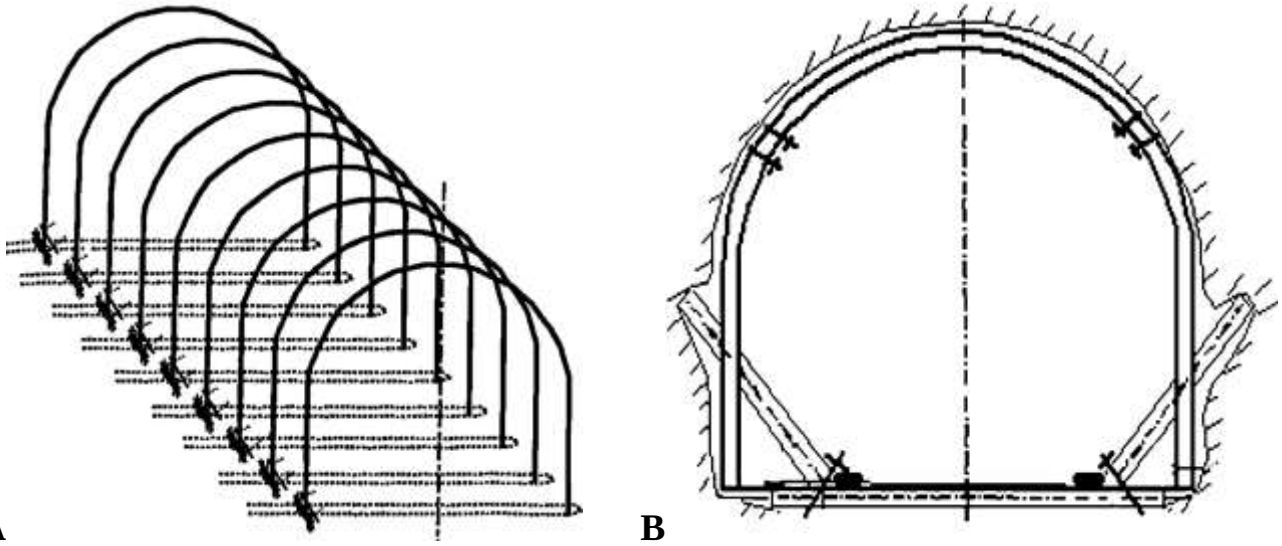

Figure 2 – Schematic view construction: (A) arch legs join by flexible crosstie coupled cable ropes and (B) cross floor bars shoring on two upright between arch legs

Experimental check of a way by force compensation to squeezing of floor rocks has been tested in the conditions of belt entry of 7th east longwall of a seam l_8^1 mines “Lidievka” (Figure 3).

Figure 3 – Nature of look roadway floor with metallical cross floor bars and upright setting on belt entry of 7th east longwall of a seam l_8^1 mine "Lidievka"

Results of observations at way of mechanical rebuff floor rocks is effectuality[6] and it takes the further inquiry in the conditions of mine of E. T. Abakumov.

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