УДК

THE ANALYSIS OF MOUNTAIN-GEOLOGICAL AND MINING CONDITIONS OF MINE-LAYERS OF DONBASS FOR THE PURPOSE OF RATIONAL APPLICATION OF HEADING MACHINES SELECTIVE ACTION

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Выполнен анализ условий возможного применения комбайнов проходческих на территории шахтопластов Донбасса

The analysis of terms of possible application of heading machines on territory mine-layers of Donbass

Problem and its communication with scientific or practical problems. Deepening of mountain works on mines of Donbass (to 10m annually) causes necessity of carrying out of developments on more and more strong breeds and more thin layers of coal with a great volume stoe layer of strong breeds. During the last years the volume of carrying out of preparatory developments has grown almost on 2 %, and specific volume of these developments on 1000 ton extraction has decreased on 6 % that testifies to increase of concentration of mountain works. Level of heading machines carrying out of developments has grown on 3,6 %. In connection with prospect of the further growth of concentration of clearing works it is necessary to increase volumes and level of heading machines carrying out of developments as a whole and on strong breeds in particular, developments of the big section as on industrial indicators this method above drill and blast excavation and is more safe. Considerable depth of working out involves difficult conditions of ventilation of mountain works. The requirement of great volumes of air for airing causes of increase in the areas of cross-section section of spent developments to 20-25m^2 and more. It leads to that many heading machines (HM), used at present on mines, work in the conditions of exceeding their nameplate data.

The analysis of researches and publications. For the analysis of a subject of researches the materials resulted in specialized [1-2] printing editions have been used.

Problem statement. A problem of the given work is the choice modern heading machines on mountain-geological and mining conditions of mines.

Изложение материала и результаты. In connection with constantly becoming complicated conditions of carrying out of underground works, it is required to use more modern heading machines.

On mine «South Donbass» №1 average rates of carrying out of developments on breeds with factor of a fortress to 6 on a scale of professor M.M.Protodjakonova, section of developments 10-15m^2 and minimum stoe layer 0,58m type combines 4ПП2 have made 200 m/mes, on dead rocks of 100 m/months, and combines of type П110 accordingly 250 and 150 m/months.

For carrying out of developments on breeds with fortress factor equal 5-7, section 15-20m^2 and stoe layer more 0,5m, on mine "Krasnoarmejskaja-Zapadnaya" type combines 4ПП2М and КСП-32 work. In the given conditions the rate of roadway developmen for type combines 4ПП2М – 130m/months, and for КСП32 – 150 m/months the given conditions also it is possible to apply rates НМ type П220 and КПД.

At carrying out of developments on mine of A.F.Zasjadko with average stoe layer 0,6m, sections of developments 13,8m^2 and 18,3m^2 on breeds a fortress 5-7 and more, use heading machines 4ПП2М, П110, КСП-32, П220. Average rates of carrying out by a combine 4ПП2М rates developments by section 13,8m^2 at a fortress of breeds 5-7 and an angle of slope more 10° have made 100m/months, combine П110 at section of developments 18,3m^2 rates of carrying out have made 80m/months, combine П220 at the same section on dead rocks roadway developmen have made 150m/months, at the mixed face – 250m/months, КСП-32 at section of breeds 13,8m^2 – 100m/months, and at section section 18,3m^2 rates roadway developmen have made 150m/months.

On main-layers of "Selidovugol" of development are spent on breeds by a fortress to 7, section of developments 10-15m^2. Rates of roadway development by type combines 4ПП2М have made 100m/months and combines of type П110 - 120m/months, i.e. in similar conditions combine П110 has the best indicators in comparison with 4ПП2М. In the given conditions can effectively work such НМ as П110, КПЛ and КСП-32.

Carrying out of developments on breeds a fortress to 7 and section of developments 10-15m^2 in main-layers of "Shahterskantratsit" a combine 4ПП2 has made about 60m/month. At such fortress of breeds combines of type П220, П110-04 and КСП-32 can effectively work. At the fortress of breeds higher 7 are applied combines ГПКС, rates of carrying out have made all 60m/month it is necessary to apply. To the given conditions modern НМ type П220, П110-1, КСП-32.

At carrying out of developments in main-layers of "Krasnoarmejskugol" on breeds a fortress to 5 and at section of

developments 10-15m^2, rates of roadway development at application of a combine of type П110 have made 165m/month, also it is possible to use НМ type КПЛ, КПН, КПР. And at carrying out of developments 15-20m^2 use combines of type КСП-32 (110m/months), in the given conditions it is possible to use combines of type of КПД and П110.

On main-layers of "Dobropoleugol" by type combines 4ПП2М developments with stoe layer 0,6-0,8м are spent, at angles of slope more than 10°, section of developments 15-20m^2 and a fortress of breeds less than 5. Rates roadway development at minimum stoe layer have made 65m/months, at maximum – 55m/months, for section 10-15m^2 and fortresses 5-7 rates have made accordingly 68 and 57m/months. In similar conditions combines КСП-32 at development section 15-20m^2 (a fortress to 5) rates have made accordingly 118 and 95 m/months, and at section of developments 10-15m^2 (at a fortress 5-7) 105 and 70 m/months, i.e. above than at 4ПП2М. Rates of carrying out by combine КП3 (at a fortress 5-7 and section 10-15м2) have made 70 and 63 m/months i.e. more low than at КСП-32.

On main-layers of «Coal company «Mine of «Krasnolimanskaya» combine КСП-32 spends developments with stoe layer 0,48-0,69m, a fortress of breeds in some developments more than 7 and section 15-20m^2. In a range of fortresses more than 7 rates of carrying out have made 60m/month. At such values of a fortress of breeds it is necessary to use combines of type П220.

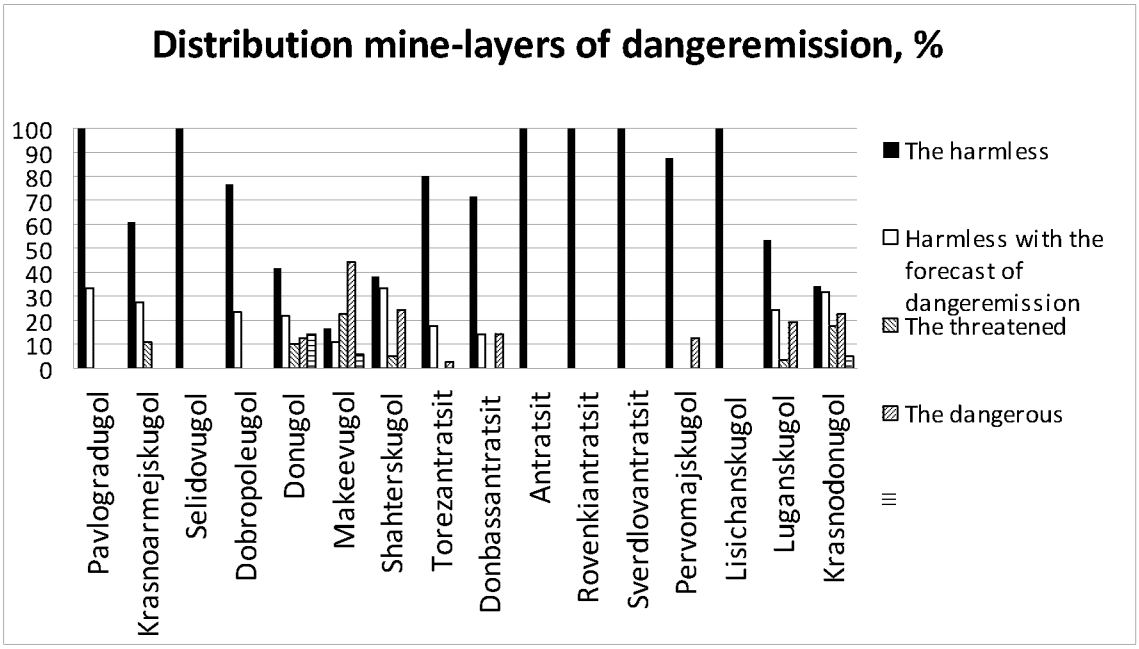
On main-layers of «Donetsk coal power company» in comparable conditions indicators of works of combine П110 (150m/months) above than at 4ПП2М (80 m/months). Combine КСП-32 works at carrying out of inclined development with water inflow 15m^3/hour with an angle of slope more than 10° and section to 10m^2, rates of roadway development have made all 40m/month.

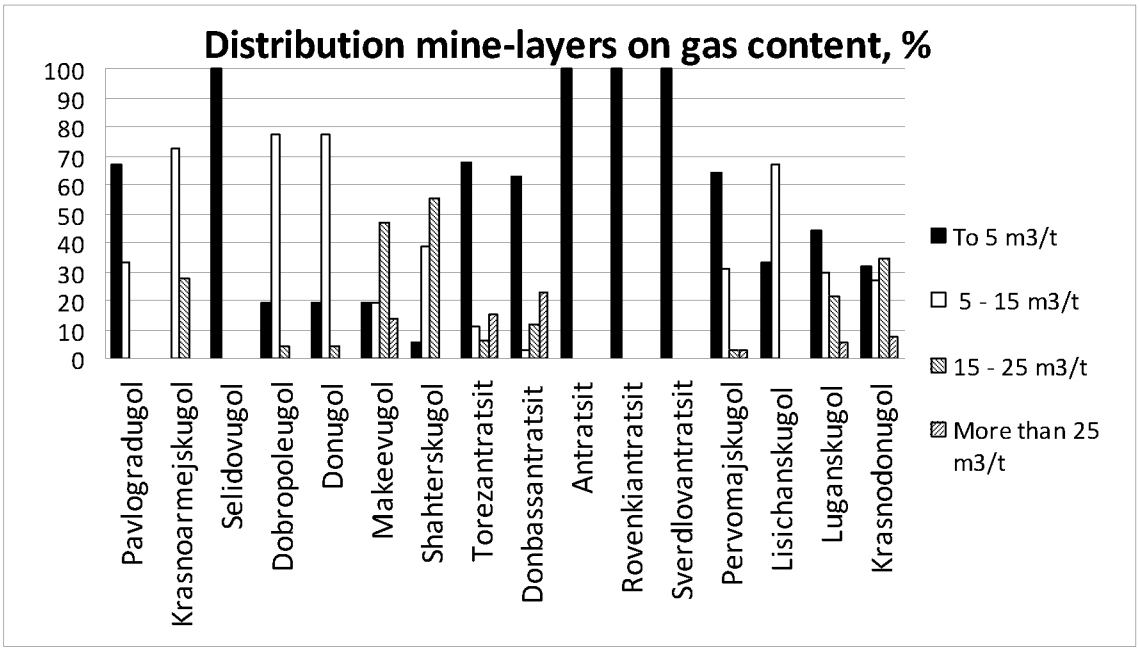
On main-layers of «Pavlogradugol» of development are spent on breeds by a fortress to 5. At carrying out of developments by section 10-15m^2 on dead rocks rates of carrying out have made for НМ: 4ПП2М – 150m/month, П110 – 180m/month, КСП-21 158m/month, КСП-32-67m/month. Combine П110 has the best indicators in comparison with 4ПП2М, КСП-32 and КСП-21.

On main-layers of «Lisichanskugol» at carrying out of field developments by combines ГПКС and 4ПП2М on breeds a fortress 5-7 and section 10-15m^2 rates of carrying out low – about 50m/month. In these conditions are necessary for applying to carrying out of field developments more about combines П220.

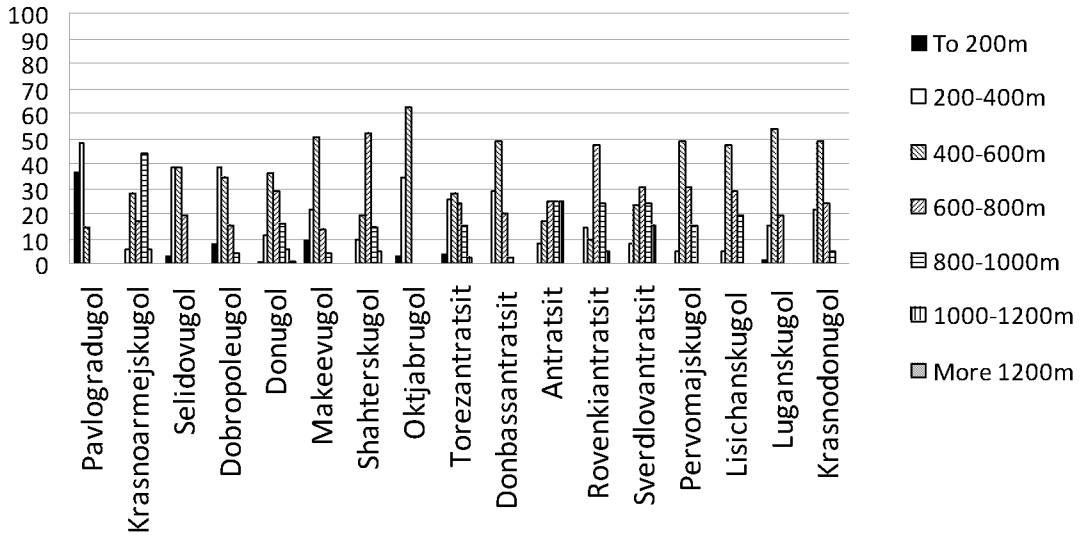
On mine «October» at carrying out of developments by section 12,8; 15,9; 17,4m^2 on breeds a fortress 6-8 it is necessary to use П220 and П110-4.

The graphic material characterising distribution mine-layers of Donbass depending on factors, characterising mountain-geological and mining conditions of application of heading machines selective action is more low resulted.

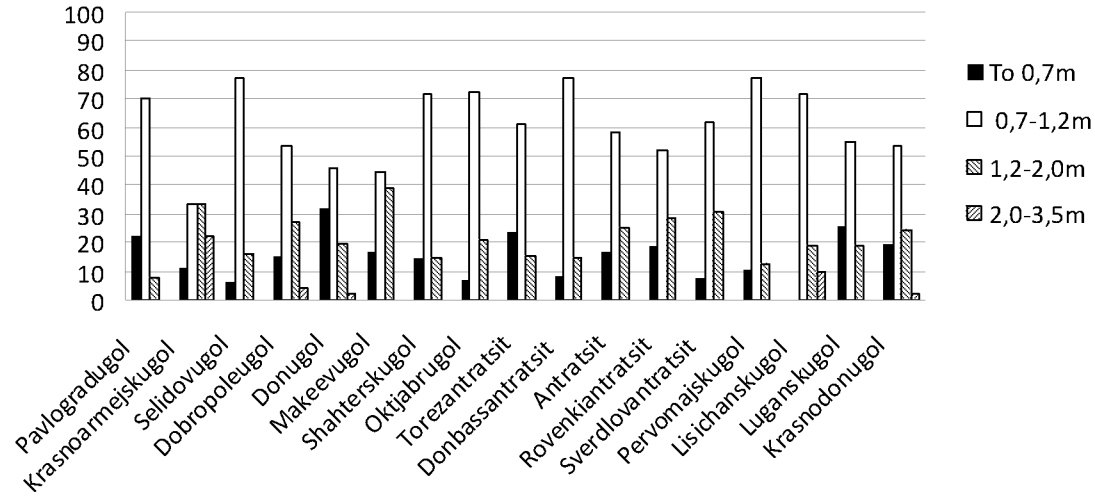




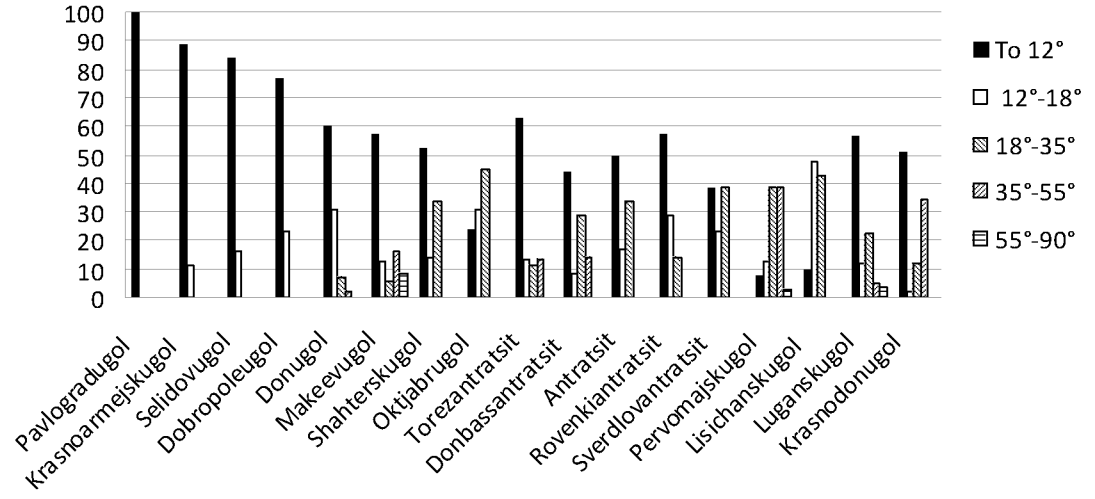
Distribution mine-layers on depth of working out, %

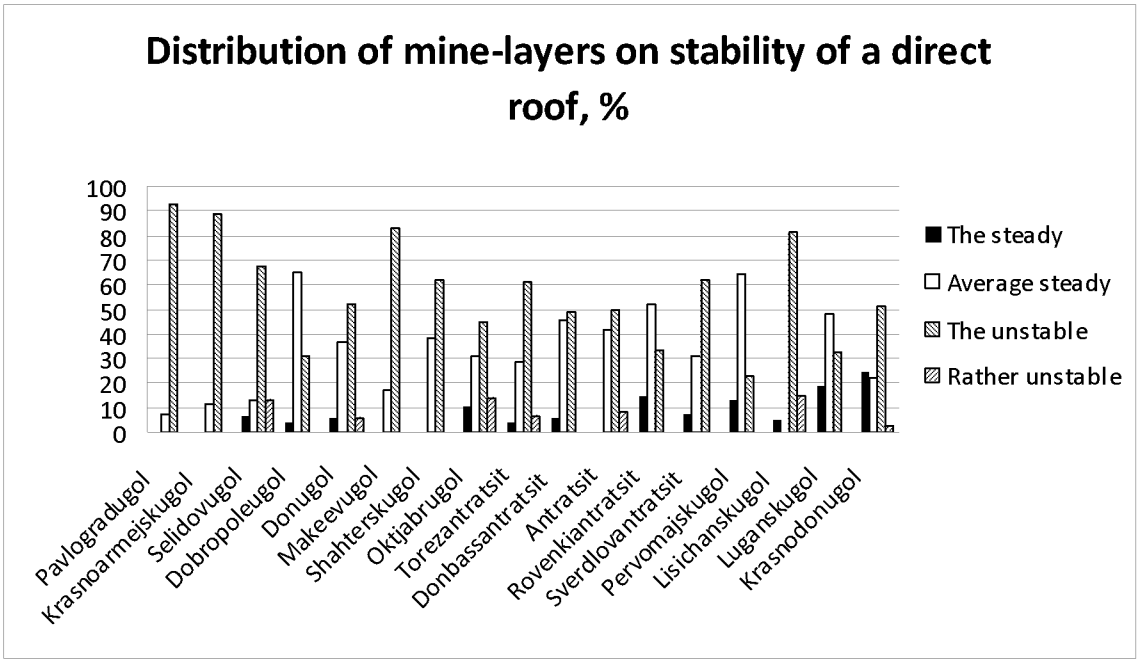


Distribution of mine-layers on capacity, %



Distribution of mine-layers on hades, %





Conclusions and directions of the further researches. The analysis of the presented material shows that the factors characterising mountain-geological and mining conditions mine-layers of Donbass, considerably differ at rather small differences in nameplate data of the combines applied in specified conditions. The data characterising operational indicators of combines of a various technological level, testifies that efficiency of application of a combine is defined not only the superiority of its technical parametres in comparison with older morally by car, but also the factors complicating application of more modern combine. So for example, water inflow 15m^3/hour has caused rates of carrying out of development by combine КСП-32 equal 40m/month in the conditions of mine of «Donetsk coal power company».

The materials resulted in article it is planned to use further at the decision of a problem of an establishment of parametres of loading a drive of body of destruction of a heading machines selective action.

The list of sources.

1. Kovalchyk V.N., Potapov V.G. Heading machines selective actions.
Etimation of basic parameters / Donetsk national technical university is Donetsk; DNTU, 2008 is mechanics of liquid and gas / Materials of the VII International scientific and technical conference.
2.To conduct an analysis and research in area of creation of Heading machines of new generation: Report / Donetsk of state compani «ЦБНТИУП» - №0110003250-Ц04/1. Donetsk, 2000 – 46pages.