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Coal Mine Design and Explosion Prevention Studies

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Abstract: In the Republic of Uzbekistan, safety measures have been taken to prevent the risk of methane, spontaneous fire, and collisions in coal mines. in Uzbekistan over the past five years, there has been a need to develop tools that allow for the correct selection of a number of preventive measures. in the conditions of the Republic of Uzbekistan processes are planned from the design stage of coal mining. Mining of coal seams Uzbekistan in the context of associated methane and spontaneous fire hazards in coal mines few studies have been conducted to develop design standards for coal panels in gassy coal seams. This article provides instructions for coal mines and extensive research-based information on designing production under associated methane and spontaneous combustion hazards. Since the first study, the presented tools and methodology have been validated many times with daily mining and mining operations under associated methane and spontaneous combustion hazards has made a significant contribution to the development of safe and economical mining operations and further increases the performance of coal mines.

Keywords: Coal utilization industry, methane percentage high explosion, coal seam hazards, placement of charcoal panels, ventilation system.

Introduction

This article covers the problematic processes in coal mines and coal mining design under bound methane percentage conditions and the risk of spontaneous fire, taking into account the circumstances that arise based on the results of studies of the used methods of ventilation of the coal panel, information is given. Natural Hazards affecting coal mines to several theories and mining companies about the onset, progression and appearance of their symptoms much research has been done on the risks involved. This concept is proposed in coal mines typical examples of relevant risks are methane percentages in mining formations and the coexistence of rockfall risks, the risk of dust and methane combined to cause an explosion may be the most likely cause, and the risk of methane and fire must be eliminated by the mining enterprise. Despite significant progress in the last 5 years detection and control of methane and spontaneous combustion hazards in the coal mines of the Republic of Uzbekistan, risks related to this are still common. This is clearly seen as the depth of coal mining and its concentration the above issues affect many countries around the world and their mining industries. For example, Australian research on underground coal mining with the longwall system is increasingly being implemented. In the design of coal mines difficult mining and geological conditions and increasing needs the results of studies on the design of the optimal ventilation system for coal panel operations are taken into

account. Increased risk, as well as has a significant effect of carrying out work under the main load. The amount of methane in coal seams increases with their depth and high concentrations of coal lead to increased methane. Coal mines analysis of emissions from spent coal panels facilitates several processes. When the charcoal panels are located are mined in very gaseous coal seams, methods of dealing with ventilation methane hazards and methane drainage are often invisible and does not show the intended results to be effective enough to reduce the risk of methane. Consequently, longwall coal face and coal production daily advance rate will need to be lowered. Widespread introduction of high coal production concentration, mainly as an important owner, by increasing the width of the longwalls affects the increase in methane emissions. What factors is of great importance in increasing the risk of methane in located coal panels and gaseous coal seams are detailed in the flowchart. This the main condition that must be fulfilled at the stage design coal panels for proper methane hazard selection preventive measures and their scope consists of risk assessment, prior to mining based on forecast calculations methane emissions will need to be considered. The prediction of the absolute methane lifting capacity for the coal panel will need to be recognized as a basis for determining the ventilation system used preventive measures. In coal mines including drainage techniques and coal production range (taking into account the impact of risks) processes must be implemented. It should be noted underestimation of methane risk at the coal design stage panel may be the direct cause of the sharp drop in safety standards in mining. This is the case for them correlation and search for solutions aimed at improvement emphasizes the need to plan by considering design methods. Coal dangerous incidents during mining and, at the same time, provision taking into account the existing level of risk, the optimal production concentration should be established. Thus, the design stage of high-gas coal mining must be prior to analyzing mining opportunities and excavation should be carried out after estimating the projected methane emissions to the coal panel. Only then will we prevent an explosion in the coal mines. The results of our operations show that when coal panels in the coal mines of Uzbekistan spontaneous fire hazard if used, and observed to be associated with deeper coal mining activities are widely promoted. Coal in deeper layers metamorphoses better than coal in shallower layers and has more non-burning fractions, making deeper layers more susceptible. Coal mines processes to prevent spontaneous combustion are complex. Also, an increase in the original temperature deeper rocks have earlier reductions in coal self-heating time and it reaches a critical temperature, as a result of which it will be necessary to reduce the time required to reach the burning temperature of the coal. Piture1 shows the cycles of spontaneous combustion of coal for coal mining. The initial temperature of the rocks is Tp1 (at a smaller depth) and Tp2 (deeper strata due to the formation of the coal seam). Disrupting Spontaneous Combustion by Designing Processes in Coal Mines and fire prevention measures cause the temperature of the coal to decrease and causing it to rise in pressure as a self-heating site causes an explosion. If the prevention used is effective the spontaneous combustion process stops or on the contrary slows down and the temperature of the mined layer decreases. Stopping self-heating in Picture 1 the process is shown by separating solid and dashed lines. In mining processes it means going from high temperature to low temperature.

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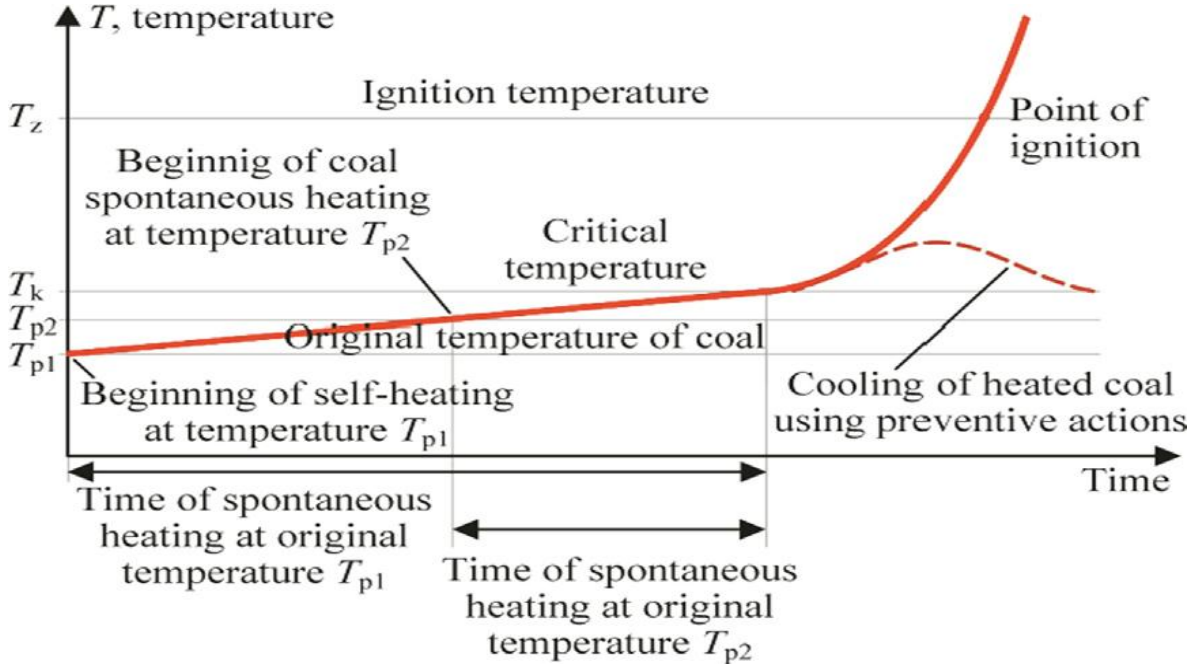

Picture 1. Influence of the initial temperature of coal on the process of spontaneous combustion in coal mines results of studies on learning.

It is clear that the results based on the research developments on the diagnosis and analysis of spontaneous fire risk in coal panels are necessary. In mining placement of remaining coal (from coal seams and/or seams), mine and reduces its impact on the occurrence of risk. He pointed out that mining processes in mines can remain in coal panel gobs, and one its occurrence on the roof of coal seams or seams covered by can be directly or become the main cave zone. Mine boundary dividing layer columns charcoal panel galleries often remain in charcoal panel gobs and is mined with a cave roof. In most cases, they are crushed and there are also times when there are cracks. Due to the difference in aerodynamic potentials at the edges, coal mines create favorable conditions for air migration. Mines - which often help the coal to self-heat and crushed coal pillars and resulting opportunity is the spontaneous initiation of fire in coal cracks. Nowadays, the factors of coal mining processes are increasing. At the design stage of the use of coal panels, the risk of spontaneous fire in mines should be recognized as important when deciding on the extent and choice of preventive measures. Location of abandoned coal in mines when designing coal mining and should be considered in the area around the charcoal panel, because it directly affects the degree of fire danger in itself. Unmined coal, depending on its location, is often subject to self-heating processes that cause it to spontaneously combust and causing spontaneous combustion. Incorrectly selected methods of coal panel ventilation and coal mining methods mining for a given level of fire risk by itself causes spontaneous combustion of coal in mines and creates an explosion hazard, which can cause a number of problems in the mining process. After choosing the right ventilation system and right coal mining method (longitudinal, transverse and diagonal) began coal mining column panel designed and specified, the longwall width is different output parameters affecting the development of both hazards should be considered. The width of the longwall designed in the mining method ensures the speed of the mine advance and if 50 m / month for the applied system of ventilation "U" type coal is hard, then the coal panel should be designed accordingly and Analytical methane risk is assessed. If there are problems to achieve the average monthly advance speed is 50 m, then the width of the long wall should be reduced accordingly.

Conclusions

Mine planning of coal seams under contact conditions in coal mining processes methane and the risk of spontaneous combustion should be considered first. In the mines on spontaneous fire risk assessment and then multi-criteria methane risk assessment studies will be necessary. Determining the level of spontaneous fire hazard in coal mines the intended coal panel determines the choice of ventilation method and parameters and initial parameters for methane risk transfer should be considered. multi-criteria methane risk assessment for engineered coal mines panels in gas coal seams and surrounding seams A methane content above 2 m3CH4/Mgdaf allows selection and appropriate methane drainage techniques are required, this technique helps to determine drainage efficiency and possible extraction. In methane conditions associated with coal mines fire hazard, the main pillar is to properly design coal mining requires the use of appropriate means to reduce the level of freight. Coal is an important global energy fuel, however, the coal mining industry faces major challenges there are global issues that need to be addressed. We here is an overview of the information provided published data on measurable objects for attention development of ecological cleanliness we can further increase the efficiency of coal mining resources. Industrial coal mining drainage, new hydrological zones, deterioration and decrease of water quality water table are the main problems of coal. At the same time, it moves forward. Sustainable mining can lead to improvement as most industries have a high demand for coal.

References

1. Mustapaevich D. K. et al. Properties of Coal, Processes in Coal Mining Companies, Methods of Coal Mining in the World //JournalNX. – Т. 7. – №. 10. – С. 231-236.
2. Ravshanov Z. et al. EVALUATION OF THE STRENGTH OF ROCKS IN OPEN MINING PROCESSES IN MINING ENTERPRISES //Science and innovation. – 2023. – Т. 2. – №. A4. – С. 96-100.
3. Ravshanov Z. et al. METHODS OF DETERMINING THE SAFETY AND ENVIRONMENTAL IMPACT OF DUST AND EXPLOSION PROCESSES IN MINING ENTERPRISES //International Bulletin of Applied Science and Technology. – 2023. – Т. 3. – №. 4. – С. 415-423.
4. Axmet o'g'li M. N. et al. Determination of mineral location coordinates in geotechnology and mining enterprises //Global Scientific Review. – 2023. – Т. 11. – С. 8-14.
5. Djaksimuratov, K., et al. "FACTORS INFLUENCING THE CONDITIONS OF OPEN PIT MINING." ORE MASS AND DEFORMATION, PROCESSES THAT LEAD TO IMBALANCE DURING EXCAVATION (2021).
6. O'telbayev, A. (2022). STRENGTH PROPERTIES OF ROCKS AND FACTORS INFLUENCING THEM AND THE PROCESS OF CHANGING THE PROPERTIES OF ROCKS. «BEST INNOVATOR IN SCIENCE - 2022» Organized by Innovative Academy. https://doi.org/https://doi.org/10.5281/zenodo.6034441
7. Ravshanov Z. Determination of mineral location coordinates in geotechnology and mining enterprises //Scienceweb academic papers collection. – 2023.
8. Jumabayeva G. PLANNING AND MINE DESIGN IN OPEN-PIT MINING PROCESSES AT MINING ENTERPRISES //Евразийский журнал академических исследований. – 2023. – Т. 3. – №. 3 Part 2. – С. 135-143.
9. Abdiramanova Z. STUDIES ON THE CHEMICAL COMPOSITION AND PROPERTIES OF PORTLAND CEMENT //Евразийский журнал академических исследований. – 2023. – Т. 3. – №. 3 Part 2. – С. 13-21.

10. Утемисов А. О., Юлдашова Х. Б. К. СИСТЕМЫ АВТОМАТИЧЕСКОГО УПРАВЛЕНИЯ //Universum: технические науки. – 2022. – №. 5-2 (98). – С. 45-47.
11. Joldasbayeva Aysulu Baxitbay qizi, Ametov Ruslan Muxtar o'g'li, Embergenov Allabergen Polatbay o'g'li, Maulenov Nurlibek Axmet o'g'li, & Kulmuratova Aliya Janabay qizi. (2022). Technology to prevent Methane or coal dust explosions in the mine. The Peerian Journal, 10, 22–32. Retrieved from https://www.peerianjournal.com/index.php/tpj/article/view/307
12. Jumabayeva G., Allanazarov B., Joldasbayeva A. STAGES OF OPEN PIT MINING. MINING METHODS AND THEIR PROCESSES //Science and innovation. – 2023. – Т. 2. – №. A1. – С. 236-240.
13. Allanazarov B. GEODETIC DIMENSIONING STUDIES AND POINT-DIMENSION LOCATION COORDINATE SCHEME CREATION PROCESSES //Евразийский журнал академических исследований. – 2023. – Т. 2. – №. 4 Part 2. – С. 21-25.
14. Джаксымуратов К. М. и др. ИСПОЛЬЗОВАНИЕ ПРЕСНЫХ ПОДЗЕМНЫХ ВОД МЕСТОРОЖДЕНИЯ КЕГЕЙЛИ //Экономика и социум. – 2021. – №. 12-1 (91). – С. 975-980.
15. Саидова Л. Ш. и др. АНАЛИЗ ИССЛЕДОВАНИЙ ПО ПОДЪЕМУ ГОРНОЙ МАССЫ ИЗ ГЛУБОКИХ КАРЬЕРОВ И ВЫБОР ГОРНОТРАНСПОРТНОГО ОБОРУДОВАНИЯ ДЛЯ ОТКРЫТЫХ ГОРНЫХ РАБОТ //Eurasian Journal of Academic Research. – 2022. – Т. 2. – №. 11. – С. 811-816.
16. Xolmatov O. M. et al. MURUNTAU KONI OLTINLI RUDALARINI UYUMDA TANLAB ERITISH USULIDA O'ZLASHTIRISHNING GEOTEXNOLOGIK SHAROITLARINI O'RGANISH //Eurasian Journal of Academic Research. – 2022. – Т. 2. – №. 11. – С. 790-797.
17. Najimova N. GENERAL INFORMATION ABOUT CHEMICAL PROCESSES AND REACTORS //Евразийский журнал академических исследований. – 2023. – Т. 3. – №. 3 Part 3. – С. 28-37.
18. Nabiev Sirojiddin Alim Ugli, & Nabieva Nilufar Olim Qizi. (2022). THE STATE OF THE WORLD'S FUEL AND ENERGY BALANCE AND THE COAL MINES OF UZBEKISTAN. Новости образования: исследование в XXI веке, 1(8), 448–450. извлечено от https://nauchniyimpuls.ru/index.php/noiv/article/view/6158
19. H.X. Normamatov, X.R. Mamataliyev, & B.Sh. Shakarov. (2022). RESPUBLIKAMIZDAGI KO 'MIR KONLARINING ZAHIRALARI, SANOAT AHAMIYATI VA ISTIQBOLLARI. Uzbek Scholar Journal, 10, 292–297. Retrieved from https://uzbekscholar.com/index.php/uzs/article/view/379
20. Joldasbayeva, A., Maulenov, N., Mnajatdinov, D., & O'telbayev, A. (2023). PROCESSES OF DRAWING UP A VENTILATION SYSTEM SCHEME IN MINES.