

AP13268798 “Development and industrial testing of technological schemes for strengthening the weakened zone of rocks at the intersection of a geological disturbance by a preparatory mine” – p.m. Khalikova E.R.

Relevance:

One of the main functions of a mining enterprise is the need for periodic reproduction of its capacity during the life of the operation, and such renewal is becoming increasingly expensive as it is carried out under continuously deteriorating mining and geological and mining engineering factors of operation, due to increasing depth and other mining conditions. Monitoring shows that construction of new mining enterprises and reconstruction of existing ones in most cases will be carried out in difficult mining and geological conditions.

The mining and geological conditions are constantly deteriorating due to the increasing depth of development of mineral deposits.

Increasing the stability of mine workings is one of the most important tasks in the underground development of mineral deposits.

The output of the scientific-applied work is the possibility of effective application of the technology of reinforcing fastening around the excavation, development of technological schemes of excavation and fastening of unstable rocks surrounding it.

The existing technological risks are also reduced due to the use of effective technology, equipment and means of fastening for mining excavations and avoiding the impact of mining factors on the operational reliability of the tunneling cycle processes.

The output of the work is the development of the technology of strengthening the roof of excavations, passed through unstable rocks, through the creation of connected fastening bridges with the use of deformation, structural and technological properties of means of fastening and geomechanical state of the near-contour massif in the justification of the parameters of stabilization of the contour of mine workings.

The project purpose:

Development of technological schemes for strengthening the weakened zone of rocks at the intersection of a geological disturbance by a preparatory excavation, providing increased stability of rocks surrounding the excavation.

Expected and achieved results:

As a result of the project implementation there will be developed technological schemes of installation of the developed fasteners, providing reduction of expenses for maintenance of workings in the disturbed rock mass, commensurable on amplitude with the taken out capacity of a layer at motivation of realization of works on increase of safety and efficiency of coal mining at mines of the Karaganda basin requires improvement of methods of prevention of influence of the increased mountain pressure, forecasting of geomechanical conditions at working out of coal seams with introduction of the first stage of mining of coal seams.

List of publications for 2024.:

– Khalikova E.R., Demin V.F., Demina T.V., Syzdykbaeva .S., Zairov Sh.Sh. Technological conditions for ensuring the stability of the array of enclosing rocks during the fastening of mine workings. Complex Use of Mineral Resources. 2024; 330(3):76-84.

[DOI: 10.31643/2024/6445.31](https://doi.org/10.31643/2024/6445.31)

– Khalikova E.R., Demin V.F., Tanekeyeva G.D., Abdrakhman E.A. Tau-ken qazbalarynyñ aralas bekıtpeleriniñ kezinde bos jynystardağy deformasiğa tau-ken tehnikalyq jağdailarynyñ äseri. Proceedings of the University. 2023. No.4. 171-177.

[DOI 10.52209/1609-1825_2023_4_171](https://doi.org/10.52209/1609-1825_2023_4_171)

– Right for the object protected by copyright Khalikova E.R., Meshcheryakov K.O. “Technological solutions for fixing rock massifs in zones of increased rock pressure behind the longwall face”, Application No. 42660 dated 06.02.2024.

– Demin, V., Khalikova, E., Rabatuly, M., Amanzholov, Z., Zhumabekova, A., Syzdykbaeva, D., Bakhmagambetova, G., & Yelzhanov, Y. (2024). Research into mine working fastening technology in the zones of increased rock pressure behind the longwall face to ensure

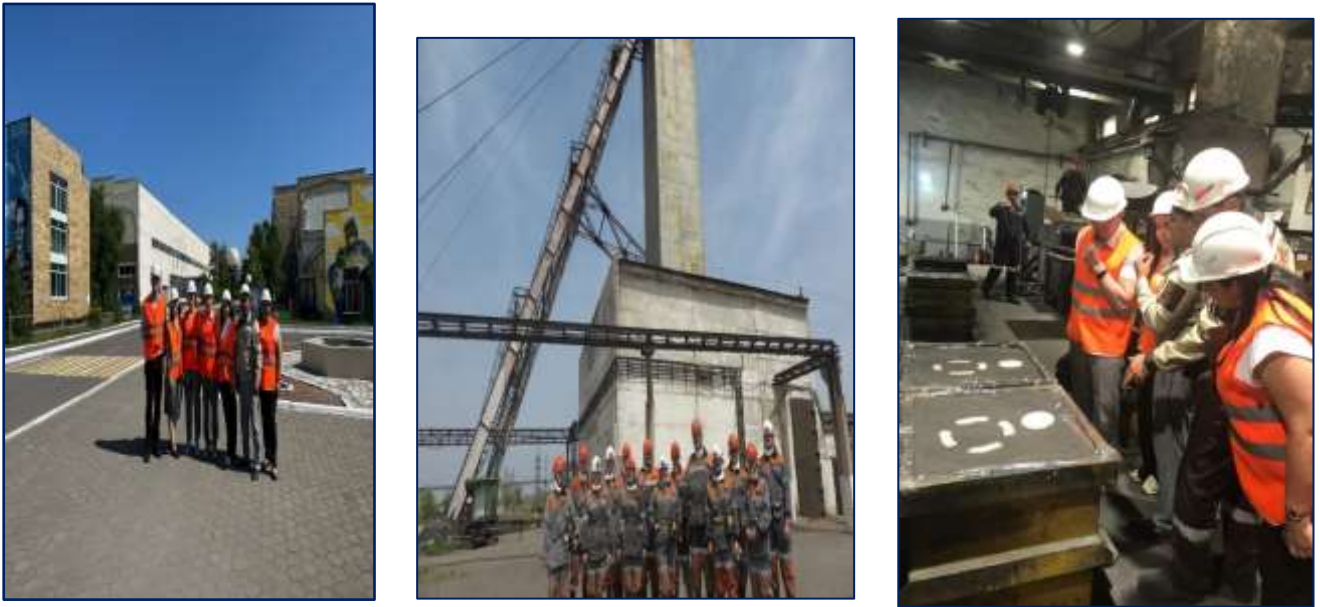


Figure 1 - Research work within the framework of the project at industrial enterprises of Karaganda region



Figure 2 - Project work on calculation of fastening materials for the entire length of the mine workings in the K-MINE program

Research team:

1. Khalikova Elvira Ravirovna – PhD, Senior Researcher at KazMRDI, Senior Lecturer at the Department of “Development of Mineral Deposits”.

Hirsch Index - 2.

Author ID в Scopus: 57212216553

Researcher ID Web of Science: ABE-4117-2021

ORCID ID: 0000-0003-1501-8492

Researcher ID in Publons: ABE-4117-2021

<https://person.kstu.kz/halikova-elvira-ravirovna-2/>

2. Demin Vladimir Fedorovich – Scientific Advisor, Professor of the Department “Development of Mineral Deposits”.

Hirsch Index - 3.

Author ID B Scopus: 57212219714

Researcher ID Web of Science: AAD-7143-2022

ORCID ID: 0000-0002-1718-856X

Researcher ID in Publons: AAD-7143-2022

<https://person.kstu.kz/demin-vladimir-fedorovich-4/>

List of publications:

– E.R. Khalikova, V.F. Diomin, R.A. Mussin, A.P. Krakovsky, U.Zh. Khanafin. Monitoring of the stress-strain state during preparatory workings. Complex Use of Mineral Resources. 2023. №1. 68-75. <https://doi.org/10.31643/2024/6445.08>

– Khalikova E.R., Demin V.F., Demina T.V., Syzdykbaeva .S., Zairov Sh.Sh. Technological conditions for ensuring the stability of the array of enclosing rocks during the fastening of mine workings. Complex Use of Mineral Resources. 2024; 330(3):76-84.

[DOI: 10.31643/2024/6445.31](https://doi.org/10.31643/2024/6445.31)

– Khalikova E.R., Demin V.F., Tanekeeva G.D., Abdrakhman E.A. Tau-ken qazbalarynyñ aralas bekıtpelerınıñ kezinde bos jynystardağy deformasiğa tau-ken tehnikalyq jağdailarynyñ äseri. Proceedings of the University. 2023. No.4. 171-177.

[DOI 10.52209/1609-1825_2023_4_171](https://doi.org/10.52209/1609-1825_2023_4_171)

– Zholmagambetov N, Khalikova E, Demin V, Balabas A, Abdrashev R, & Suiintayeva S. (2023). Ensuring a safe geomechanical state of the rock mass surrounding the mine workings in the Karaganda coal basin, Kazakhstan. Mining of Mineral Deposits, 17(1), 74-83. <https://doi.org/10.33271/mining17.01.074>

– Demin, V., Khalikova, E., Rabatuly, M., Amanzholov, Z., Zhumabekova, A., Syzdykbaeva, D., Bakhmagambetova, G., & Yelzhanov, Y. (2024). Research into mine working fastening technology in the zones of increased rock pressure behind the longwall face to ensure safe mining operations. Mining of Mineral Deposits, 18(1), 27-36. <https://doi.org/10.33271/mining18.01.027>

– Patent No. 7955 from 14.04.2023 Rope anchor / Khalikova E.R., Demin V.F., Isakov B.K., Zhumabekova A.E., Demina T.V., Abdrakhman E.A., Tanekeeva G.D., Balabas A.Yu. -2 p

– Right for the object protected by copyright Khalikova E.R., Meshcheryakov K.O. “Technological solutions for fixing rock massifs in zones of increased rock pressure behind the longwall face”, Application No. 42660 dated 06.02.2024.

Information for potential users:

As a result of the project realization the technological schemes of installation of the developed fasteners will be developed, providing reduction of expenses for maintenance of workings in the disturbed rock mass, commensurable on amplitude with the taken out capacity of a layer at motivation of realization of works on increase of safety and efficiency of coal mining at mines of Karaganda basin..

Scope:

Mining operations of the coal industry with the extension of the obtained scientific and technical potential to underground mining enterprises.

Information update date: 05.07.2024