

BR24992803 « Development of rational technology for mining operations based on the impact on the technogenic state of the host rock massif». s.r. - Abeuov E.A.

Program annotation:

A very important problem of underground mining of mineral deposits at the stage of deep reform of the fuel and energy complex industries is ensuring a stable state of the rock mass in the vicinity of mine workings in order to create conditions for their reliable performance of their functions. During the construction and operation of mines and pits, the problem of the stability of the rock mass in mine workings is of great importance, and when conducting mining operations in complex mining and geological conditions, it requires urgent scientific and technical solutions.

The problem of maintaining mine workings during their service life exists in unstable rocks, where the stresses in the massif are comparable to its strength: at great depths, in zones of influence of cleaning works and tectonic disturbances. It is most acute in new deposits and ore fields due to the lack of objective information on the stability of rocks for choosing certain methods of their physical and chemical strengthening.

The increase in the depth of mining operations leads to the complication of mining-geological and mining-technical conditions for the development of mineral deposits and requires a systematic approach to the production of processes for the conduct and support of underground workings. At the same time, the need for geomechanically monitoring, analysis and forecasting of the state for the effective maintenance of mine workings is growing, due to the various forms of manifestation of rock pressure.

The purpose of the program:

Creation of a rational technology for conducting mine workings based on the impact on the technogenic state of the host rock massif, with the establishment of its optimal parameters depending on the mining and technical conditions of development.

The objectives of the program are:

1. analysis of the current state of the industry and development of the concept and characteristics of new products.
2. assessment of the scope of application of the proposed technical and technological solutions with the selection of the best alternatives for development and implementation.
3. formation of a model for zoning and establishing the area of rational application of means of fastening and stabilizing the near-contour rock mass around mine workings.
4. substantiation of the parameters for fastening and stabilizing the rock mass, taking into account the man-made manifestations of mining factors based on computer modeling using the finite element method using the Ansys, RS2 and UW programs.
5. development of normative and technical documentation.
6. experimental design development of progressive methods and means of fastening for managing the state of the massif and improving the quality of anchored rocks, adaptive to changes in mining and technical conditions of development, based on the use of the man-made stress-strain state of the massif of marginal rocks.
7. experimental and technological work with the implementation of complex work on the implementation of developments in industrial conditions, based on regulatory and technical documentation with an assessment of the conformity of samples with design characteristics and the effectiveness of their use in mines and pits.
8. commercialization of technologies, methods, means of fastening and stabilization for mines and quarries. Production of a pilot batch.

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