

Discrete and continuous models and monitoring in mining industry  
(Monograph)

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The complex model which reproduces processes of joint functioning of technology is developed for conditions of big group of underground mines of Russia and CIS countries of equipment and the organizations of production and allows making their calculations. The model is steady in time that allows using it for calculations within 5-7 next years after its construction. It is convenient in calculations, contains only three factors, and considers about 76% of all expenses for production of crude iron ore by underground way.

The complex model includes key parameters of production: the annual production rate of work, the capital-labor ratio and the annual capacity of mine and characterizes their influence on prime cost.

New data on the nature and degree of influence on the final performance of technological, technical and organizational factors are obtained. These data are important information for expected calculations of technology and equipment of underground mines; use of these data significantly increases reliability and accuracy of calculations.

Calculate the approximate unit cost of equipment and costs that depend on the technology and organization of production, which, together with the calculated correction factors increase the reliability and accuracy of the calculations. They can be used in the practice of design institutes and industrial associations in the design plans of modernization in the industry.

On the basis of complex model is constructed, that the discrete and continuous model of production is more fully than specific features of certain; accuracy of calculations for this model increases from 27 to 46%.

With the using of complex model the technique of an assessment of additional mountain opportunities of mines at their modernization is developed that more effectively to carry out additional increase in volume of production of ore at design of modernization of mines in scales of certain regions, instead of branch as a whole at necessary relative increase of the necessary capital-labor ratio no more than 5%.

The technique of short-term expected calculations is developed at design of modernization of mines.

The method of expeditious control of technology, equipment and the production organization by monitoring of level and nature of change of the corresponding expenses is offered, which can signal the need to take effective measures to address the final trends of mines.