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**WORKING OUT OF THE GEOMECHANICAL PARAMETERS
AND THE WAYS OF CREATION ROCKBEARING
CONSTRUCTION FROM UNLOADED BY EXPLOSION
AND THE STRENGTHENED ROCKS IN MINING
DEVELOPMENTS**

05.15.11 "Physical processes
Mining extraction»
05.15.02 "Underground mining
Deposits useful Minerals »

THE AUTHOR'S ABSTRACT
Thesis on scientific degree competition
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GENERAL CHARACTERISTIC

Dissertational job is executed on chair "Building of mines and underground constructions" Komunarsk Mining and Metallurgical Institute during the period with 1973 for 1987 according to the program of scientific and technical problems on underground mining on the basis of improvement of technological processes, creation of new ways and means of carrying out, protection and maintenance of mining developments.

The fulfillment researches is a component of these researches №15.04 Mining Ministry of Coal USSR and reflected in scientific reports № GR 71045753, 76021074, 74037651, 01630022522, 01830032648, 80016828, 81055755, etc. under a scientific management of the author.

The research purpose: an establishment of laws, and a substantiation of methods of calculation of displays of rock pressure, working out and introduction in industry of ways and means active mining influences on a status of rocks round the horizontal developments for providing their operational stability.

The idea of job consists in management of a stress status and durability of rocks massif and creation round development powerful rockbearing construction from the unloaded and strengthened rocks, capable to prevent negative consequences of rock pressure.

Methods and objects of research. The scientific substantiation, working out and the practical application of methods of calculation and ways of support of stability of mining developments were carried out by application of the complex technique which are switching on as compound, mutually supplementing elements, analytical researches, mine tool supervision, laboratory experiments, industrial check and introduction of scientific design and recommendations, about a massif of rocks, them strengthen and deformation properties, development of mechanical processes of deformation and destruction of rocks massif round capital and preparatory mining developments, influence of extraction works, ways of increasing of horizontal developments stability.

The most essential scientific results received personally by the competitor and their novelty:

1. Laws of development of rocks destruction round the development, consisting that stability of development depends on a kind of an stress status of rock are theoretically proved and experimentally confirmed: destruction of rocks from the compression, conducting(leading), to increase of concentration of pressure(voltage), promotes the further movement of front of fragile destruction and decrease in stability

of development() whereas process of destruction from stretching(dragging out) pressure(voltage) spontaneously stops also a new contour of development() gets the steady form.

Laws are established(installed) and the mathematical model of formation of a zone of not elastic deformations round the development, differing by the account of nonlinearity of other-wordly deformation of rocks and antisymmetrical influences of major factors from which follows, that an initial field of stress in situ is the most important, factors of strength anisotropy and heterogeneity of rocks are enough important, and mass forces in near contours rocks are essential only at low residual bearing ability of rocks and small support repulse.

3. The mathematical model kinetic fragile destruction of the rocks, differing by concept association thermo fluctuating durability and concept damages theories, as its measures, is developed. For the first time are experimentally defined rheonomical properties of rocks, the mechanism of development of destruction near contours rocks round development in time is opened and proved as kinetic process of growth micro damages in massif in a different field of stress of moving front of destruction/ Problems kinetical movements of destruction front round development are solved for the first time.

4. Laws of change of an stress status of a massif and stability of preparatory development in a vicinity of a moving longwall on which basis necessity of the account of periodicity a sloughing of the basic rock roof is proved, lengths of its console and speed of movement of a longwall are experimentally established and theoretically proved at management of rock pressure.

5. New ways of support of stability of mining developments are developed at not elastic deformation of the surrounding rocks, based on management of an stress state and durability of a massif of rocks and differing by active unloading of a massif, forming the unloaded zone of rocks of the set form and the sizes, and then create rockbearing real design by their deep strengthening.

Validity and reliability of scientific positions, conclusions and recommendations are proved:

In experimental researches - representative data of great volume of mine tool supervision and the laboratory researches spent in mining developments and on rocks samples in a wide interval of change of the basic influencing factors taking into account requirements of metrology, with use of modern techniques, the equipment and devices that has provided demanded degree of accuracy and reliability (with probability of 0.9 deviations of defined parameters have not exceeded 15-30 %);

In theoretical researches - validity of the accepted initial preconditions and methods of researches, with use of scientific concepts of solid mechanics, the theory of durability and plasticity, mechanics of destruction, physics of rocks, a correctness of statement and the decision of problems of analytical researches. All calculations are finished to numerical results and compared to experimental data, and the divergence does not exceed 30 %. Inevitable idealizations of settlement schemes are analyzed, compared with data of laboratory and natural researches and, if necessary, are specified for achievement of adequacy to nature.

The creations of active ways of support of developments stability are confirmed by mine implementation, and at a final stage - successful use in the design and industrial organizations.

Scientific value of thesis consists in theoretical generalization, a formulation and a substantiation of scientific positions under the description of stability and process of destruction of rocks round underground developments, in creation of the theory of active ways of management by geomechanical parameters and intense stresses and durability of rocks for support of developments stability.

Practical value of thesis consists in a substantiation, creation and implementation of the active ways of management by rocks stability and mechanical processes round developments; creation rockbearing designs from unloaded by explosion and the strengthened rocks, calculation and optimization of their geomechanical and technological parameters.

Offered classification and methods of calculation of the rocks stability are based on laws of kinetic rocks destructions, and allow to pass to new level of the description of rocks destruction and deformation in underground developments, to increase reliability of design decisions, to lower expenses for lining, maintenance and protection of developments stability.

Publications. Thesis substantive provisions are published in 80 printing articles and 50 patents.

Structure and thesis volume. The thesis consists of introduction, 5 chapters, the conclusion and 6 applications, contains 121 drawing, 17 tables and references from 396 names. Thesis is stated on 272 pages, its total amount of 487 pages.

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