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## **MATHEMATICAL MODEL OF ROCKMASS BEHAVIOUR IN UNDERGROUND COAL GASIFICATION**

Mechanism of rockmass behaviour in underground coal gasification is in a great extent alike to the processes which accompany the wallface coal extracting in mining. Therefore it is necessary to conduct research of the deformed state of rockmass around underground gasgenerator on the basis of change conformities of rockmass moving in the mine conditions.

In research of rocks deformations by mine pressure, where the methods of calculation are based on hypotheses or statistical information, the row of hypotheses is used which connect lowering of daily surface to the limits of the wallface taking out through the angle of rocks destruction. These angles and moving rocks of daily surface are based on nature researches. At this method of calculation basic attention is paid to the calculations of deformation of daily surface lowering.

The mathematical model of the tensely-deformed state of rockmass is based on the theory of plasticity, resiliency and maximum equilibrium.

The results of calculations are accepted only for the terms, where nature research was conducted.

Application of calculation method of the tensely-deformed state of rocks, developed in NMU by Professor A.V. Savostianov, will allow to define geomechanical parameters, related to the conduct of rockmass during gasification of coal seam.

The advantage of this method of calculation is taking the features of rockmass stratification with formation of cavities stratification, unevenness of loadings distribution in rock seams, dynamics of rocks behaviour.

The methods of calculating of parameters supporting pressure ahead of wallface mean the determination the width of supporting area and degree of tensions in it at the mining seam level. Description of seam area and determining location of maximum tensions requires mine measurings at the level of seam.

The developed a mathematical apparatus and algorithm of calculating borehole underground coal gasification (BUCG) and allow:

- to take into account stratification, formation of vertical cracks and cavities
- to determine rockmass stress recognition with account to natural factor and technological parameters, including the features of coal seam gasification;
- on the basis of prognosis rockmass behaviour at BUCG it is possible to ground the dynamics parameters of stratification cavities, set the rational parameters of injection technology which provides the reliability of underground gasgenerator operation;
- to set the parameters of coal seams gasified with account to the changes in rockmass stress;
- the results of calculations allow to set the parameters of stratification cavities, the place of their location in a rockmass in relation to underground gasgenerator, considering geological and technological conditions.