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NEW APPROACH TO THE DESIGN OF MINING OPERATIONS

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Purpose is to develop a new approach to the design of mining operations basing upon models and methods of decision making.

Methodology. The paper has applied a complex approach involving approaches of decision-making theory. Analysis of the production development scenarios is proposed for strategic activity planning; criteria to make decisions under the uncertainty conditions as well as decision-making trees for day-to-day management are proposed to determine balanced production level.

Findings. It has been identified that mining production design is of the determined character demonstrating changes in "state of the nature" depending upon the made decisions. The idea of mining production is to reduce uncertainty gradually by means of analysis of production scenarios, and elimination of unfavourable alternatives. Operative management is implemented while constructing decision trees, and optimizing operation parameters. Representation of sets of rational equipment types as well as development scenarios, and their comparison in terms of decision-making parameters makes it possible to determine adequate capacity of a working area, and to reduce expenditures connected with the equipment purchase and maintenance. In this context, limiting factors, effecting anticipatory mining output, are taken into consideration.

The study has been carried out within the framework of research project of the NAS of Ukraine for young scientists "Resource-saving techniques to support mine

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FREQUENCY COMPATIBILITY OF DRIVE SYSTEMS WITH DYNAMICS OF DRILLING RIGS

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Purpose. Solution of the actual scientific and applied problem of the modern quick-acting drive systems frequency characteristics dynamic compatibility with the drilling rigs dynamic characteristic.

Methodology. Experimental study of the DC drive armature current, AC drive stator current, rotational speed, power consumption, vibration displacement of the pressure swivel head crosspiece and harmonic analysis of transient graphs in the start and start drilling modes.

Findings. Analyzing the experimental data obtained in the mining and geological conditions of mining and processing plants, the following generalizations one can be made: 1. Increase in the speed of the bit rotation leads to increase in the frequency and amplitude of the drill rod oscillations; 2. Axial pressure on the drill rod practically does not affect the values of the frequencies of forced vibrations; 3. With increase in drilling depth, the vibration amplitudes increase due to a decrease in the rigidity of the transmission (since with an increase in the depth of the well, the operating rotation frequencies become lower).

In the drilling rig SBShS-250N in the with an AC transistor drive has appeared new regularity: with an increase in the rotational speed of the drill bit, the unacceptable oscillation amplitudes of the drill rod are appear at frequencies lower than in the SBSh-250MN-32 drilling rig with a DC drive.