Management Model for the Mining Process

in the Conditions of Restructuring a Mining Company

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Summary

This dissertation presents a new model for managing the mining process in a hard coal mine. The repetitive procedures proposed in the newly developed model are mainly aimed at assessing the economic viability of carrying out planned mining operations in terms of opening, development and extraction of a specific area of reserves or a part thereof. Most importantly, this assessment is done before any work begins, meaning before the associated costs are incurred.

In its assumptions the newly developed mining process management model for mining companies and their coal mines concerns the planning processes and it allows for:

1. performing a preliminary assessment of the suitability of a particular area of reserves for economically efficient mining,
2. estimating direct costs of possible variants of developing the deposit, its exploitation and work organisation, and thus selecting the most economically beneficial variant,
3. performing a measurable assessment of the reliability of the planned (forecasted) extraction volumes that determine the level of revenues from sales of commercial coal at a given sales price.

The measurable, preliminary assessment of the suitability of an area of reserves for extraction is made based on a number of established technical parameters that have been assigned specific weight values.

Spreadsheets will be used to estimate the direct costs of developing and mining an area of reserves. The theoretical idea behind the spreadsheets, presented earlier in professional literature, through the introduction of numerous modifications, was used to create a real tool to calculate these costs (a special computer programme was developed to facilitate the completion of the spreadsheets).

To perform a measurable assessment of reliability of the adopted mining plans, the last step of the new method, the calculation of the so-called mean forecast error was proposed.

After providing the above theoretical assumptions, the dissertation presents the results of the model verification tests performed. They concern the selection of two coal seams in the reserves of two coal mines - the appendices to the dissertation contain excerpts from their maps with the proposed areas of development of those seams along with a schedules of planned heading, reinforcement, mining and phase-out works.

The next chapter of the dissertation presents a detailed analysis of the obtained research results, including a presentation of how the estimated direct costs of the planned mining works can be used in a given mine to assess economic profitability. Moreover, suggestions are included for making changes to the existing spreadsheets to adapt them for better use in practice. This chapter also describes some additional insights that arose in the process of verifying the proposed assumptions, which relate to improving the way mining processes are managed in the facilities of a mining company.

The last chapter of the dissertation is a summary of conclusions and recommendations, formulated on the basis of the proposed assumptions of the new model, their practical verification and its results.