

Artyom Yarkovich
V.I. Buzilo, research supervisor
N.V. Poperechna, language adviser
SHEI «National Mining University», Dnipropetrovsk

Technology Solutions for Developing Very Thin Coal Seams in Western Donbass

Currently coal mines in Ukraine have extracted more than 2 billion tons of rock, which is stored in 1270 waste dumps. At the same time more than 30 thousand hectares of the land are taken out of the economic use. The annual increase in the area of disturbed land, caused by mining operations, is more than 500 hectares. Only in Western Donbass more than 6,000 hectares of fertile lands were flooded and swamped as a result of underworking.

Increasingly thin and very thin seams, which account for 70% of the total amount, are being mined. The use of old machinery and technology for their extraction is accompanied by significant undercutting of roof or ground wall rocks, which results in substantial waste rock dilution.

All of the above mentioned highlights the need of leaving mining waste rock in situ, i.e. modern technology of stoping on the thin coal seams should be applied to a full or partial goaf stowing.

This technology can solve not only the problem of waste rock disposal, but also other problems: monitoring the rock pressure effectively, reducing gas emission and inflow of water into the mine working, improving mineral recovery rate and reducing its dilution, improving safety and working conditions of miners.

However, in order to leave waste rock underground it must be separated from the coal during the process of production. It may be possible by implementing selective extraction of coal from undercut rocks with backfilling waste rocks in worked-out area while developing thin and very thin seams.

The technology of selective mining of thin and very thin coal seams with backfilling worked-out area eliminates negative trends in the mining industry improving the quality of the mined products, ergonomics and environmental friendliness of mining. In addition, it provides a feasibility of mining very thin seams of coal, classified as non-commercial increasing the life of a number of mines.

So the investigation carried out at the Department of Underground Mining of the National Mining University showed that:

- development of very thin coal seams will extend the life of Pavlogradugol mines by an average of 25 years, and in some cases – up to 65 years;
- reserves which are considered to be unpromising can be worked out providing an additional 341 million tons of coal;
- cost of coal production will decrease by 10-13%;
- coal ash content is not more than 18%, which is 7% lower than in conventional ore processing.