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Surveying of Mine Workings Supported with Rock Bolts

Modern mining industry of Ukraine is currently facing the issues of gradual raising of coal production and its intensification. Supporting system like rock bolt is used as a safeguard against toppling caused by intensive coal extraction and it transfers the load from unstable exterior to the confined interior of rock mass. It should be recognized that installation of various reinforcement systems and their timely maintenance leads to significant cost savings. Besides, anchoring provides the resistance and reliability of mine workings while reducing metal costs.

Over the last decade, research on condition of mine workings supported with rock bolts has increasingly demonstrated that the rate of deformation at the edge of massif previously neglected by mine surveyors requires detailed study.

The lack of a unified approach to the normative standards and nonconformance with collected data about conditions of mine workings to passport of mine workings supported with reinforcement systems may be hazardous for mine surveyors whose job is to efficiently estimate the condition of deformation at the edge of massif in a particular mine working.

Until now, mine surveyors apply the method of visual monitoring and measuring to estimate the rate of edge massif deformation on a specially constructed observation stations. Observation stations are usually constructed during the entry driving. Regular measurements are carried out at these stations and vertical and horizontal convergence is defined.

The aim of this work is to develop a method that enables the mine surveyor to effectively assess the state of workings and to predict areas that require immediate reinforcement. Reference picket, heights and width, seam height of mine working serve as initial data for any mine surveyor who want to compare the actual condition of mine opening with a previous one.

Due to its relative simplicity and accuracy in measurements method proposed can be introduced and practised in mine workings of Ukraine without attraction of additional human and technical resources