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Angular Measuring Errors in Underground Surveying Reference Networks

One of crucial tasks of angular measuring is to avoid the regular error occurrence. Traditionally, the surveying reference networks have been used as a main geometrical basis of all underground surveys which involve polygonometric traverse laying, as a rule, on the permanent mine opening and main opening.

Mine surveyors utilize this practice while making measurements inside proposed mine openings in a particular designated underground area. Deflection angles are measured between every two adjacent sides of traverse, declivity angles and stroke lateral length of each individual polygon. Every single measurement is made with some tolerable error which finally results in the error accumulation and the state of being unable to adequately plot the points position. The process of error accumulation is predetermined by polygonometric traverse and its configuration specifics characterized by short length of traverse and the scarcity of benchmarking.

Measurement precision of polygonometric traverse laid at plotting of underground surveyor supporting network is harmonized with normative standards (further referred as standard 1 and standard 2)

Current research makes an attempt to systematize and optimize measurements by comparing them with mentioned above normative standards. Consequently, the data received let us make some implications:

Recommendations within normative standards "Surveying operations in coal mines and drill cores on how to use theodolites with measurements precision of 15 seconds" do not guarantee the required accuracy in measurements of deflectional angles.

This suggests that current research results can be recommended for minimization of angular measuring errors occurrence for any prospective measurement procedures.