

A New Approach - A Numerical Assessment of Ground Strata Failure Potentials in Underground Mines

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Abstract : Ground strata failure or fall-of-ground is one of the underground mines' most prominent catastrophic risks. Mining companies use various methods/technics to prevent and critically control the associated risks. Some of those are safety by design, excavation methods, ground support, training, and competency, which all require quality control and assurance activities to confirm their efficiencies and performances and identify improvement opportunities through monitoring. However, many mining companies use quality control (QC) methods without quality assurance (QA), and they call it QA/QC together as a habit. From a simple definition, QC is a method of detecting defects, and QA is a method of preventing defects. Testing the final products at the end of the production line is not the way of proper QA/QC application but testing every component before assembly and the final product once completed. The installed ground support elements are some final products mining companies use to prevent ground strata failure. Testing the final product (i.e., rock bolt pull testing, shotcrete strength test, etc.) with QC methods only while those areas are already accessible; is not like testing an airplane full of passengers right after the production line or testing a car after the sale. Can only QC methods be called QA/QC? Can QA/QC activities be numerically scored for each critical control implemented to assess ground strata failure potential? Can numerical scores be used to identify Geotechnical Risk Rating (GRR) to determine the ground strata failure risk and its probability? This paper sets out to provide a specific QA/QC methodology to manage and confirm efficiencies and performances of the implemented critical controls and a numerical approach through the Geotechnical Risk Rating (GRR) process to assess ground strata failure risk to determine the gaps where proactive action is required to evaluate the probability of ground strata failures in underground mines.

Keywords : fall of ground, ground strata failure, QA/QC, underground

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