Assessment of Mine Haulage Drift Safety Using Probabilistic Methods of Analysis

Abdellah, W., Mitri, H. S., and Thibodeau, D.

Abstract:

Mine haulage drifts are the arteries of any mine, as they are used to transport the valuable ore out of mining zones, as well as, miners and equipments. Hence, their stability is considered a crucial issue in deep underground mines. Drift instability leads to serious consequences such as injuries, production delays and higher operational cost. This paper examines the issue of haulage drift safety, and probabilistic methods are used to assess the drift failure or unsatisfactory performance. Criteria used to define drift failure conditions are; extent of yielding, and brittle shear failure. The Monte-Carlo Simulation (MCS) technique is used in conjunction with finite difference modelling software FLAC for random assignment of model input parameters in the FLAC grid. Comparison between these different failure conditions is carried out to determine the most critical failure or unsafe performance conditions of the mine haulage drift.

Keywords:

Underground Mining, Haulage drifts Stability; Numerical modelling; Monte-Carlo Simulation (MCS).

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