

TDR MONITORING OF OVERBURDEN DEFORMATION TO VERIFY MODELED BEHAVIOR

Kevin M. O'Connor¹ and John A. Siekmeier²

Abstract

This paper presents research on measuring and modeling overburden response to longwall mining. The goal of this research has been to define the probable mechanics of rock mass failure over high extraction mines. A procedure has been developed to systematically locate horizontal discontinuities within the model based on drill-core logs and rock mass ratings. Subsurface displacements were monitored by placing coaxial cables in the drill holes, anchoring them to the rock with expansive grout, and interrogating the cables using time domain reflectometry (TDR). The commercially available Universal Distinct Element Code (UDEC) was used to simulate the plane strain response of horizontally bedded sedimentary rock along the centerline of a longwall panel. Simulated displacements along rock mass discontinuities are consistent with those measured using TDR. The analysis of eight high extraction mines has shown the importance of incorporating the bedded structure of the rock mass and plastic sliding along discontinuities into any numerical model that is intended to accurately simulate rock mass behavior.

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