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CAPABILITIES OF NUMERICAL MODELING OF STORAGE CAVERNS LOCATED IN CLOSE PROXIMITY TO DOMAL BOUNDARIES

Cody A. Vining, RESPEC, Rapid City, South Dakota USA
Stuart A. Buchholz, RESPEC, Rapid City, South Dakota USA

Abstract

This paper presents the results of a modeling study that was performed to identify possible limitations of numerical models representing a solution-mined cavern in proximity to domal boundaries. Factors are identified that have a significant impact on the predicted structural stability and operational performance of the cavern. Three-dimensional, finite difference numerical models of a solution-mined salt cavern were developed to assess the assumptions for in situ stress, material properties, domal boundary distance, and constitutive models. The results of this parametric study indicate that the predicted cavern performance is highly dependent on these assumptions, and discretions should be taken to identify a constitutive model and material properties that accurately represent the behavior of the formation surrounding the dome.

Key words: Numerical Modeling, Domal Boundary, Solution-Mined Caverns

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