

Safe and economic cavern construction in the Etzel Cavern Field based on geological 3D-Modelling

Bärbel Kleinefeld¹, Joachim Behlau², Hans-Joachim Schweinsberg³

¹ DEEP. Underground Engineering GmbH, Bad Zwischenahn, Germany

² Federal Institute for Geosciences and Natural Resources (BGR), Hannover, Germany

³ IVG Kavernen GmbH, Friedeburg, Germany

Abstract

The main objective of the geological planning and supervision of any drilling campaign for salt cavern construction is the sound understanding of the geological conditions within and around each cavern well and the entire salt deposit. That way, geological risks for the drilling activities and solution mining process can be identified as early as possible and appropriate measures can be taken.

In fall 2006 a new drilling campaign commenced on the Etzel salt dome aiming to extend the storage capacity beyond the limits of the existing cavern field that had been visualised in a geological 3D-model the years before. Thus, for the first time in cavern business a detailed digital 3D-model could be used for selection and evaluation of new cavern locations and strategic optimization of the drilling schedule. In the course of the ongoing drilling campaign with up to 4 rigs operating simultaneously, the model has proven its very high accuracy and hence holds a strong potential for an significantly enhanced utilisation of salt resources with positive effects on time and cost optimization.

The paper is to be seen in the succession of previous papers on the use of geological 3D-modelling and an extensive geological programme and presents first practical examples of their benefit for safe and economic cavern construction [1, 2, 3].

Keywords: Geology, Domal salt, Computer Modelling, Cavern Design