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The research project "Bernburg Testcavern"

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esco – european salt company, Bernburg salt work - Germany

Abstract

The Bernburg salt work, esco – european salt company GmbH & Co. KG, uses the existing deposit by extraction of rock salt with drilling and blasting and by leaching from surface drillings since 1965.

The extensive product assortment made of rock salt and brine finds use in the chemical industry, in the processing trade and as food salt. 75 % of the rock salt won by extraction are uses for road salt. The leached cavities are used for storage of sources of energy, e.g. for liquid gas since 1969 and for natural gas since 1974.

The knowledge of geomechanical parameters is crucial for planing of mining activities, e.g. the dimensioning of the single cavern, the cavity field and, particularly, the determination of the optimal storage pressure. In order to extend the knowledge of these geomechanical parameters, extensive research has been done in the past.

Based on the long term experiences in salt mining by solution and traditional techniques of the Bernburg salt work a field test has been performed underground. In the project "Bernburg Testcavern" the following aspects were regarded:

1. Validity of the applied dimensioning procedure for mining and cavern design for long period of operation.
2. Determination of the extent of permeation processes into the cavern wall after brine filling and pressurization to facilitate applications to flooded salt mines.
3. Serving a geotechnical data basis for describing long term convergence processes by adjusting of the secondary stationary creep conditions in the post-closure phase of operation.
4. Comparison of the knowledge of results of tests in cavities in salt domes in large depths with those of flat bedded salt formations.
5. Consequences for long-term safty of barrier pillars against brine-filled and sealed cavities and salt mines.