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Re-assessment of the Creep Behaviour of the Rüstringen Salt Dome for Optimization and Future Development of the Crude Oil Cavern Storage Facility

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Abstract

The Rüstringen cavern storage, owned by the Erdölbevorratungsverband (EBV), is operated by the Nord-West Kavernengesellschaft (NWKG) for more than 30 years as part of the German strategic petroleum reserve. For the re-evaluation of the more than 30 year old rock mechanical design and future development of the cavern storage, NWKG set up a master plan starting with studies in order to re-assess and extend the knowledge about the Rüstringen salt dome in terms of geology and rock mechanics.

In the rock mechanical part of this study the strength characteristics of the rock salt and its time dependent deformation behaviour had to be re-evaluated.

This was difficult, as not sufficient salt core material was available in order to carry out a representative rock mechanical study in the laboratory. To compensate for this shortcoming, field data and experience gathered during operation had to be taken into account to re-assess the rock mechanical properties of the rock salt mass.

The paper outlines the general concept of the applied indirect evaluation procedure. Field observations, measurements as well as in situ test data are incorporated to develop an overall picture of the creep ability of the rock salt mass surrounding the caverns.

Keywords: *rock mechanics, back analysis and interpretation, in situ testing*