THE DEVELOPMENT OF NATURAL GAS CAVERNS AS A TRADING TOOL AND THE CONSEQUENCES

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Abstract

It is becoming increasingly important to carry out thermodynamic calculations starting from the very first stage of storage planning and continuing right on up to the actual storage operation in gas caverns. The reason for this is that on the one hand the availability of gas quantities and the efficiency of the storage facilities need to be determined and on the other hand these have to be predicted as reliably and as quickly as possible. History match methods and particularly the predictions (on a daily or hourly basis) of pressures, temperatures and operating gas amounts in relation to the existing storage situation are therefore important tools for the storage operator to enable him to react to short and medium-term market needs.

SOCON Sonar Control Kavernenvermessung GmbH recognized the need for and so developed a software package that, based on the SOCON sonar survey in caverns under gas together with the accompanying logs, answers the remaining thermodynamic and rock mechanics questions. This provides the cavern operator with the opportunity to increase operational safety and at the same time allows the capacities and performance profiles during injection and extraction to be assessed (history match) and predicted.

Key words: Gas storage caverns, Thermodynamic simulation, Convergence, History match, Prediction, Dew point, Hydrate formation conditions