

GAS STORAGE IN SALT CAVERNS ZUIDWENDING - THE NETHERLANDS

Quirijn Hoelen - N.V. Nederlandse Gasunie - The Netherlands

Henk Dijk - Akzo Nobel Salt - The Netherlands

Fritz Wilke - DEEP. Underground Engineering GmbH - Germany

Max Wippich - DEEP. Underground Engineering GmbH - Germany

Abstract

The Dutch based national gas transport company Gasunie is finalizing an underground gas storage project involving the storage of natural gas in salt caverns. The project is the first of its kind in the Netherlands. AkzoNobel has been cooperating in the realization of the caverns.

The storage project is located in a salt dome near the village of Zuidwending in the province of Groningen, situated in an area, where AkzoNobel has held a mining license since the 1960s. AkzoNobel has produced and is currently producing brine from this area, which is being processed in its Delfzijl facilities. Coincidentally, this salt dome lies on top of the Groningen gas field. The Zuidwending project received board approval to start construction early in 2006 with gas coming on-stream by the end of 2010.

Four caverns, with geometrical volumes of approx. 600 000 m³ each, have been leached during the last three years. Two of the four initial caverns have recently been filled with gas, whereas the third and the fourth cavern will reach this stage in November this year. The caverns will be operated between 90 and 180 bar, resulting in a working gas volume of some 50 million m³ (n) per cavern. In order to obtain high send-out capacities and high send-in capacities of 0.4 million m³/h per cavern with low pressure drop, two wells are installed per cavern.

The gas facilities were mechanically completed by end of June 2010 and are being commissioned and tested in the last quarter of 2010. The gas storage will be owned by Gasunie Zuidwending BV, a 100% subsidiary of Gasunie. As Gasunie has been appointed as operator by the Dutch State Supervision of Mines, Gasunie will conduct the operations and maintenance on behalf of Gasunie Zuidwending BV. A fifth cavern with a targeted volume of 900 000 m³ has been in the leaching stage since February 2010 and will come on-stream by the end of 2013.

The paper will give an overview about the different aspects of the first gas cavern project in The Netherlands and will also introduce two further presentations regarding the geological challenges of cavern construction and the characteristics of leaching the caverns with two boreholes.

Key words: Caverns for Gas Storage, Cavern Design, Drilling, Seismic, MIT, Rock Mechanics, Subsidence