

RECOMPLETION OF A GAS STORAGE CAVERN UNDER ATMOSPHERIC PRESSURE

Botho Saalbach, Kavernen Bau- und Betriebs-GmbH, Hannover, Germany

Jacobus Steijn, Kavernen Bau- und Betriebs-GmbH, Hannover, Germany

Heinz Berger, EWE Aktiengesellschaft, Oldenburg, Germany

Dirk Zander-Schiebenhöfer, IUB, Universität Hannover, Germany

Abstract

EWE Aktiengesellschaft (North-West Germany) operates a gas storage cavern field in Nüttermoor with a working gas volume of approx. $1 \times 10^9 \text{ m}^3$ (V_{st}). The subsurface equipment of one of the 16 existing caverns required recompletion due to a leaking travel joint. Recompletion job required the cavern to be flooded, which in turn required the following particulars to be taken into account:

The brine left at the cavern bottom was covered during the gas first fill in 1982 with a special sump sealing medium, named "Oppanol", to reduce the water vapour content in the gas. In September 2002, a sample was taken from the fluid left at the cavern bottom. It was found the Oppanol was still in place. To perform the recompletion the cavern was flooded with water. To avoid an outflow of the Oppanol from the cavern – and possible contamination and disposal issues – it was decided to flood the cavern only up to the cavern roof. During the recompletion the well was filled with nitrogen. Recompletion was at atmospheric pressure at the cavern roof. The new completion was installed with a pre-stressed gas production string without a travel joint and with a subsurface safety valve in upper position.

Key words: sump sealing fluid, leak detection, atmospheric cavern pressure, cavern neck, recompletion, releaching.