

# Planning and Testing of a New Process for the Forced Drying of HP-Natural Gas Caverns

*by*

P. Jensen

Dansk Olie- og Gasproduktion A/S

U.E. Todt

KBB-GmbH

## 1 Abstract

Over the last 20 years there have been various attempts at optimising the operating behaviour of gas storage caverns during the initial years of operation targeted at maximising the working gas volume and the production capacity. A primary aspect is to reduce the water content of the stored gas, thereby lowering the dewpoint and suppressing early hydrate formation.

This enlarges the effective working gas volume and simplifies gas handling. The emplacement of a sump seal is one of the methods tried and proven in practice. This inhibits evaporation of water from the cavern sump, one of the sources of water responsible for a raised dewpoint.

In order to improve the operating behaviour of the cavern store still further, i.e. additionally lowering the water content of the stored gas, the DOPAS Forced Drying Method was planned, tried and patent applied for in collaboration with KBB. The objective of this process is to accelerate the drying of the cavern walls to remove one more source of water which would raise the dewpoint.

This method entails the forced, piston-like displacement of the stored gas via a 4 1/2" riser pipe and the 9 5/8" - 4 1/2" annulus. This drying of the cavern walls enables the water content of the stored gas to be lowered to achieve the desired dewpoint, for example down to pipeline specifications within less than half or a third of the time required by conventional drying in the course of frequent turnovers.

Forced drying is straightforward and extremely cost-effective. Full security of supply is given during the procedure. A full scale test with excellent results was performed by DOPAS in cooperation with KBB on two caverns belonging to DANGAS in LI.Torup/Denmark.

The presentation describes the development and planning of the full-scale test, and the evaluation of the results.

Operational and cost aspects are also discussed.