

Safety evaluation of cavern completions and cavern repairs

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Summary

A number of underground storage reservoirs have been in operation for 30 years and even longer.

Contrary to surface installations, which are subject to supervision provided by law, underground installations are subjected only to occasional investigations.

Thus, after more than 30 years of operation, the question must be raised concerning the safety-engineering status of these installations.

Based on the existing geological and technical documentations, operating know-how, as well as measurements, a method has been developed that permits the estimation of the safety-engineering status of production and observation wells. These measurements also include casing inspections indicating the wall thickness and the oval shape as a function of the depth - but also testing procedures for checking the casing joints.

The safety-engineering evaluation permits steps to be taken that serve the maintenance and / or increase of the safety of operation. As an exception to the rule, these might be re-completions. So far, cavern re-completions always used to go along with flooding the cavity.

In order to save the expenses involved, techniques for cavern repairs under gas pressure have been developed.

Applying to all the three items listed:

- safety-engineering evaluation of wells
- casing inspection, and
- cavern repair under pressure

Practical experiences have been gathered in all these fields.