

10 years of experience and practical application of the SOMIT™-method during MITs in Europe - Perspectives for application during MITs in North America

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Abstract

Mechanical integrity testing is part of the standard cavern acceptance procedure before commissioning of a storage cavern or as periodical control during storage phase.

Since 10 years the SOMIT™-method (Sonar Mechanical Integrity test method) has been applied successfully in several cavern fields spreaded all over Europe on about 80 wells in total up to now. This method has the highest accuracy in determination of changes in the interface depth among all interface determination methods (mm range). Therefore test duration can be shortened down significantly.

When the debrining string is snubbed out the interface is set below the inner pipe and the tool “looks” from above with its high precision sonar to the brine/ testmedium interface. However, an interface in the annulus cannot be detected without further installations.

In many North American storage caverns the debrining string is left inside the cavern and therefore the interface is correspondingly set in the annulus during the MIT.

To apply the SOMIT™-method also for this kind of installations is possible if a bypass is installed at the wellhead between annulus and inner pipe and the testmedium is injected then parallel into both strings. Following the law of communicating pipes the interface in the annulus can be set to the required test depth. The control of interface changes can then be controlled with the SOMIT™ tool inside the inner pipe. Due to the high accuracy of the tool it is possible then to detect interface changes on large cavern areas in acceptable time duration which could be tested otherwise only with a brine pressure test.

As the tool is equipped beside the sonar with a high precision temperature and pressure sensor the temperature and pressure changes can be monitored continuously during the test in addition to recording temperature and pressure profiles along the length of the well at the beginning and end of the survey.

The paper gives an overview of the SOMIT™-method based on the practical field experiences in Europe and shows that only minor modifications on the general test procedure are necessary to make this method applicable for North American caverns especially for caverns which can be tested up to now only with pressure tests.

Keywords: SOMIT, MIT, Mechanical Integrity Test, sonar, cavern testing