

CAVERN ABANDONMENT: THREE IN SITU TESTS

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Abstract

Three tests, with the main objective of analyzing the long-term behavior of abandoned caverns, currently are performed: at Etrez, a gas storage facility operated by Storengy, since 1997; at Carresse, a decommissioned LPG storage facility operated by Total, since 2005; and at Gellenoncourt, a brine field operated by CSME, since 2009.

The Etrez and Carresse tests (trial-and-error tests) were supported by the SMRI. After these tests were completed, pressure gauges were left *at the wellhead*, providing additional available data.

The results of the Gellenoncourt test were not published yet. During this test, pressure and temperature gauges were set *in the cavern*.

These caverns are relatively shallow (950 m, 310 m and 250 m, respectively). They had been kept idle for a long time before the tests were run, and the rock masses had reached thermal equilibrium — except for the Carresse cavern, which had been “de-propaned” three years before the test began. In such conditions (1) cavern creep closure and brine permeation through the cavern walls are the main phenomena governing pressure evolution, (2) the pressure consistently remains smaller than geostatic, and (3) the risk of fracture onset due to high cavern brine pressure can be ruled out.

Key words: salt caverns, cavern abandonment, in situ tests