Abstract

In performing the mechanical integrity test (MIT) on storage cavern wells the most widely used method world wide is the In Situ Balance method (ISB). The principal sources of errors in the execution and evaluation of the test are the variables depth change of the gas/liquid interface and the surface area of the interface.

In the past the interface depth has been predominantly determined using radioactive methods, i.e. gamma-gamma, neutron-gamma and neutron-neutron tools. The disadvantages of these methods are the low measurement accuracy and the need to perform several tool runs during the test period (additional source of error!) because cost factors normally prevent continuous measurements.

This paper presents a method (SoMIT) based on ultrasonic techniques in which the interface depth, the temperature and the differential pressure at the interface depth can be measured continuously during the tightness test while achieving much greater levels of accuracy than was previously the case. In the SoMIT method a tool is fixed in place throughout the entire test period such that the problems associated with several tool runs are also avoided.

The advantages for users are to be found in the greater accuracy available to verify the tightness of the well and also in the reduced test period.