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EFFECTS OF CHANGES IN THE PRESSURE AND TEMPERATURE OF THE TESTING FLUID DURING A LIQUID-LIQUID MIT

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Abstract

Every year, hundreds of mechanical integrity tests (MITs) are performed worldwide. A large amount of literature has been dedicated to various technical aspects of MITs. The Solution Mining Research Institute (SMRI) suggested a reference for interpreting the results of an MIT (Crotono, 1996). However, especially in densely inhabited areas of Europe, there is a growing public concern about the safety of underground storage; when performing tests, higher accuracies are currently required.

One objective of current research is to achieve a 1-cm resolution in the measurement of interface displacement. In such a context, a precise mathematical description of the test is required. Skaug et al. (2011) and Lampe and Ratigan (2014) have discussed the influence of transient disequilibrium in the vertical distribution of temperature in the wellbore. The present paper concerns the effects of cavern pressure and wellbore transient temperatures in the case of a Liquid-Liquid MIT and how they affect MIT results both when the standard method (logging tool) and the pressure-differential method are used.

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