

Detecting and Locating Tubing-Casing Leaks from Analysis and Acoustic Fluid Level Records

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Abstract:

The efficiency of most artificial lift systems is reduced significantly whenever the tubing and the casing annulus are in communication due to the presence of unwanted holes or leaks developed in some of the hardware used in the completion. Detection of the problem from analysis production records must be followed with field tests that verify the diagnostic before proceeding with repair operations.

Conventional single-shot acoustic fluid level measurements have been used in the past, using special procedures, to generate acoustic records that in the presence of tubing-casing holes may exhibit anomalies that point to the location of the hole or leak.

This presentation describes a new, advanced user-friendly system that allows simultaneous acquisition of dual acoustic records, one via the tubing and one via the annulus, using acoustic sensors for easy and efficient installation. The procedures for acquiring the data and the latest software tools used for the analysis to verify the presence of the hole and locate its position within the wellbore are discussed in detail. Field examples of measurements performed in gas lift and plunger lift wells are presented to illustrate the new application.