

Monitoring Multi-Zone Gas Wells to Reduce Operational Cost and Risk

Alejandro Sanchez
Schlumberger Canada Ltd, Calgary
asancheze@slb.com

There are a large number of gas wells in the Western Canadian Sedimentary Basin (WCSB) that are completed with a velocity string. Velocity strings are typically installed to increase the velocity of the produced fluids to aid in the removal of liquids from gas wells. With such strings installed, it is typically impossible to perform production logging operations to determine production profiles. The determination of production profiles is important to identify contributing intervals and properly allocate production to different geologic zones or formations.

This presentation will discuss how slickline conveyed fiber optic distributed temperature sensors provide the measurements required to create an inflow profiling solution for Western Canadian operators. By monitoring multi-zone gas wells which have a velocity string installed with this new technique, operators are able to reduce operational risks when compared to running conventional production logs with the incumbent workover activities required.

In a multi-zone gas well, monitoring the measurement of continuous and simultaneous temperature traces versus depth and time is important to understand the dynamics of the wellbore. These measurements are conducted through the velocity string completion where the tubing shoe is located below the perforated intervals. This eliminates the need of expensive workover/snubbing operations that would typically be required to perform conventional spinner production log. The fiber optic slick-line is run inside the velocity string tubing thereby allowing the annulus to produce the gas and measuring the temperature profile along the entire well. The distributed temperature data results are used to calculate the inflow gas reservoir contribution through thermal analysis. Recently, operators are realizing the benefits of monitoring multi-zone gas wells through a velocity string are a cost effective method that reduces operational risk in comparison with conventional production logs. This process has been used successfully in several instances in Western Canada.