MATURE FIELDS

CASE STUDY

Caelus Energy Alaska Avoids Costly Workover and Saves USD 3 Million

ACOUSTIC CONFORMANCE XAMINER® (ACX™) TOOL IDENTIFIES LOW-RATE GAS LEAK IN PRODUCTION CASING

ALASKA

CHALLENGES

- A well with a gas lift completion could not be gas lifted due to a leak.
- Previous attempts by competitors to locate leaks in the operator's wells were unsuccessful.

SOLUTIONS

- Halliburton recommended its Acoustic Conformance Xaminer® (ACX™) service, which uses hydrophone array technology to locate and describe communication paths and flow areas – vertically and radially – in the wellbore area in real time.
- Unlike other ultrasonic leak detection technologies, the ACX tool's radial locator has proven invaluable in some wells that have been logged by identifying which annulus or component of a completions system is leaking.

RESULTS

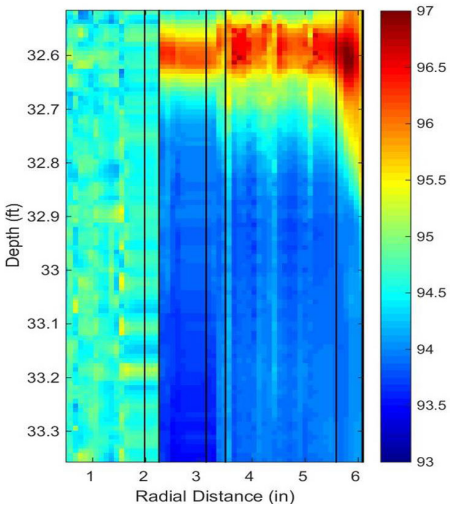
- The service was able to identify the leak in the production hanger casing, as well as in a gas lift mandrel. The repairs could be made from the surface, saving Caelus Energy Alaska a costly workover operation and approximately USD 3 million.
- The ACX service was able to accurately identify the leak, and Caelus Energy Alaska was able to use the gathered data to remediate the leaks and get production back on track.

OVERVIEW

Caelus Energy Alaska had a well with a gas lift completion experiencing inner annulus (IA) to outer annulus (OA) pressure communication (95 psi/day OA buildup) when the IA was pressurized with gas. Because of the leak, the well could not be gas lifted, limiting production. Previous attempts to locate leaks in the field with ultrasonic leak detection technologies were unsuccessful, and efforts to solve this problem were abandoned. Halliburton proposed locating the leak using the Acoustic Conformance Xaminer® (ACX™) tool. The gas-only leak was activated by pressurizing the IA while bleeding pressure from the OA. The entire well was logged with the ACX tool, and additional stationary readings were taken at zones of interest. High-definition waveforms and flow map processing identified a shallow leak in the production casing hanger, while ruling out several zones of interest by using radial location, which is unique to the ACX tool. Since the leak was identified near surface, Caelus Energy Alaska plans to use a sealant repair method and avoid a USD 3 million workover operation. Another leak in a gas lift mandrel was remedied with a dummy valve, which was confirmed to be successfully repaired during a subsequent run.

CHALLENGE

Caelus Energy Alaska had a well with a gas lift completion experiencing inner annulus (IA) to outer annulus (OA) pressure communication (95 psi/day OA buildup) when the IA was pressurized with gas. The well could not be gas lifted due to this leak, limiting production. Previous ultrasonic leak detection technologies were unable to reliably locate such leaks, which affected several of this operator's wells, and efforts to solve this problem were abandoned.



The flow map is clearly illustrating a leak from the inner annulus (IA) to the outer annulus (OA) only 32 ft from surface. The gas injection was in the IA.

SOLUTION

Halliburton proposed locating the leak using the new Acoustic Conformance Xaminer (ACX) tool, which uses hydrophone array technology to locate and describe communication paths and flow areas – vertically and radially – in the wellbore area in real time. The array triangulates on the sound/flow source in or around the wellbore. Array analysis also helps eliminate false readings that have more to do with the well structure than the leak source.

HALLIBURTON

The new ACX technology will be invaluable to our organization to find small tubing or casing leaks, which previously we were not able to locate

The radial locator has proven invaluable in some wells that have been logged by identifying which annulus or component of a completions system is leaking.

The gas-only leak was activated by pressurizing the IA while bleeding pressure from the OA. The entire well was logged with the ACX tool, and additional stationary readings were taken at zones of interest. One such zone was near the production casing hanger, which is where the leak was identified by using high-definition waveforms and flow map processing. This same processing was able to rule out several other zones of interest by using radial location, which other ultrasonic technologies cannot do. An additional leak (IA to tubing) was located at a gas lift mandrel and was confirmed to be repaired on a subsequent ACX run after the Halliburton Slickline group changed out the dummy valve.

RESULT

Since the leak was identified near surface, Caelus Energy Alaska plans to use a sealant repair method and avoid a USD 3 million workover operation.

A subsurface manager with Caelus Energy Alaska noted, "The new ACX technology will be invaluable to our organization to find small tubing or casing leaks, which previously we were not able to locate. Knowing definitively where the leak is provides us the best opportunity to perform a repair. Being in Alaska, our costs are extremely high, so reducing the amount of time diagnosing and repairing leaks has a large value to us."

ACOUSTIC CONFORMANCE
XAMINER® TOOL
SAVED
CAELUS ENERGY ALASKA
USD 3 MILLION

www.halliburton.com

HALLIBURTON