**Conference:** IPTC, 12-14 Feb 2024, Dhahran

**Paper Title:** Annular Barrier Evaluation across Multiple Casings to Diagnose Well Integrity

**Paper No:** IPTC-23553-MS

**Authors:**
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1. **Objectives/Scope.** Please list the objective and/or scope of the proposed paper (25-75 words).

Evaluation of the annular barrier is an integral part of well construction, production assurance and side-track scope. The current industry practice is to run sonic and ultrasonic tools to evaluate the barrier quality across a single string. However, many wells require the evaluation of the barrier behind a second pipe, for which today, the inner string has to be pulled out to log the outer string. The dual-string technology allows the simultaneous evaluation of both string annulus without having to remove the inner string.

[84 words]

2. **Methods, Procedures.** Process Briefly explain your overall approach, including your methods, procedures and process (75-100 words).

A new innovative technology using a combination of multimodality ultrasonic imaging and multimode advanced array sonic measurements has been developed to evaluate the barrier quality in the second annulus. The paper will describe the underlying measurement physics, the implication of well geometry, the impact of pipe-to-pipe standoff, the correction, and the validation scheme.

[53 words]

3. **Results, Observations, Conclusions.** Please describe the results, observations and conclusions of the proposed paper (100-200 words).

The dual-string barrier evaluation technology was logged in an offshore well in the Middle East. Data were recorded with both 9 5/8-in. and 13 3/8-in. dual string configuration. The 9 5/8-in. string was pulled out and a subsequent log was recorded in 13 3/8-in. for validation. Data interpretation and benchmarking provided insights on the qualitative barrier state and demonstrated dual-string measurement robustness and accuracy. The technology will allow the drilling and completion team to obtain key integrity data earlier, in order to make informed decisions ahead of rig arrival for workovers and sidetracks.

[83 words]

4. **Novelty/Significance/Additive Information.** Please explain how this paper will present novel (new) or additive information to the existing body of literature that can be of benefit to and/or add to the state of knowledge in the petroleum industry (25-75 words).

Dual-string barrier evaluation technology provides a new solution to assess zonal isolation for two strings at the same time. This technology enables more efficient well integrity diagnostics and provides insights to plan ahead. Potential rig savings are realized by not having to pull the inner string if the cement/barrier quality behind the outer string is sufficient. The technology also provides data to plan for any remedial operation.

[67 words]