Optimizing Standards for Setting Production Packer in ERD Wells with Smart Completions using Specialized Glass Disk Technology: A Saudi Arabian Global Success Story of the First Application in Closed System


Abstract:
OBJECTIVES/SCOPE: The objective of this paper is to share the success story of improving the process of activating production packers in high-angled ERD wells with Smart Completions installed. The challenges involved were resolved through the use of the specialized Glass Disk Technology rather than the conventional mechanical bridge plug method. It was the first time globally that this specialized Glass Disk Technology was used on a closed system application.

METHODS, PROCEDURES, PROCESS: Installing barriers for activating production packers in high-angled extended-reach wells is fraught with risks of stuck plugs, partially set packers, and costly remedial jobs. These risks are amplified in the presence of smart completions where-in it is critical to mate the upper part of the smart completions with the lower part of the completions. Past job failures have resulted in costs of over $500k per failure incident. In contrast, Glass Disk Technology valve is a close-ended sub-integral to the completion string. It is a multi-cycle, remote-activated glass plug. The simplicity of the valve’s operations helps eliminate several operational steps that could lead to problems in the conventional method.

RESULTS, OBSERVATIONS, CONCLUSIONS: Glass Disk Technology job plan for the first candidate well with smart completions involved preparing a customized set of procedures to match the use of Glass Disk Technology with the trial well parameters. To ensure job success steps, critical core modules were built into the overall job plan. A proper communication protocol was established with all parties involved. The tools were prepared and tested in the workshop prior to mobilization to rig site. The Glass Disk Technology was run and then tested to set the production packer. Subsequently, the Glass Disk Technology was to be pressure cycled fourteen (14) times with 2650psi.
In the first job trial for the application, the upper ESP completions was modified with the inclusion of a Single-cycle tool and the Glass Disk Technology. The completion was then successfully run, and the production packer energized using the Glass Disk Technology. The glass shattered at exactly the last cycle as per plan. Additionally, in case of failure to shear, the contingency would have been a simple run of a tool for shattering the disk.
Novel / Additive information to the existing body: Continuous drive for improvement led to the discovery of the applicability of Glass Disk Technology to further enhance ESP-plus-Smart completions job execution, thus not only helping to reduce risks involved with conventional method but also resulting in significant cost savings.