Installation And Evaluation Of Electric Intelligent Completions

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Abstract

Objectives/Scope: Electric intelligent completions are being increasingly used in the industry enabling real time downhole monitoring and downhole inflow control from multiple compartments. In addition to the full electric downhole valves the system may have additional sensors like pressure and temperature sensors, venturi flow meters, and water cut sensors. The system can be combined with downhole wet connect tool which allows for two-stage installations. The objective of the proposed paper is to present the installation of the electric intelligent completions and the functionality of all its components.

Methods, Procedures, Process: Various procedures were employed to evaluate and test the equipment, the first approach involved assessing the design and product validation tests. Additionally, the shop tests conducted on the equipment will be discussed in the paper. Furthermore, the paper will address the upgrades that were conducted on the equipment and the completion architecture. The installation of the equipment and the function tests conducted on the inflow control valves and downhole sensors will be highlighted in the paper.

Results, Observations, Conclusions: During the installation, the downhole wet connect was tested and it has allowed for the completion to be installed in two trips. The test shows that the power and data between surface and downhole equipment were successfully transmitted with no communication errors or data loss. During the evaluation phase, the equipment has been tested during the well flowing and shut-in scenarios. The results from the function tests performed indicates that the valves are functional and were tested by operating them from fully closed to fully open in 5% increments. The downhole parameters like pressures, rates and water cut were directly measured and calculated from the measured values.

Novel/Additive Information: The utilization of electric intelligent completions is becoming increasingly favored as a viable alternative to current hydraulic systems because of the increasing reliability of high temperature electronics. This paper aims to contribute to the industry’s knowledge base of the equipment and the necessary function tests to verify its reliable operation and optimal performance.