Contribution ID: **88** Type: **Poster**

Design and Safety Considerations to Perform Coiled Tubing Operations in Large-Diameter, High-Temperature Geothermal Wells

Wednesday, October 9, 2019 5:40 PM (20 minutes)

With limited CT operations in HT, large-diameter geothermal wells across the world, planning and executing interventions under those conditions can be challenging. As such, equipment failure risk is high, preventing successful nitrogen lift operations. To gain further understanding of operations in HT and cold water down-flow environments, CT simulations were combined with simulations from geothermal reservoir to overcome modeling limitations. The outcome helped designing customized downhole tools (e.g., nozzles) and a new cooling loop system; they also allowed optimizing the nitrogen lift technique. As a result, two large-diameter geothermal wells were lifted safely and successfully with 2-in. CT.
Best practices extracted from this study will be best applied as a reference to design, prepare, and safely perform CT jobs in wells with large-diameter casing and high bottomhole temperatures.
Engineering methods and steps taken to prepare and execute successful CT operations under those conditions are provided so that operational setup can be optimized to minimize risk and improve efficiency. This study specifically focuses on CT operations performed in South-East Asia and aiming to lift geothermal wells with nitrogen. It details how the equipment—such as bottom-hole nozzles, surface cooling loop designs, pressure control equipment, bottomhole assembly seal material—was engineered to perform under the harsh conditions encountered in HT, large-completion geothermal wells. The optimum kickoff depths along with N2 rates from CT simulations were combined with the results from geothermal reservoir simulations, which led to very good results. Specifically, on-job temperature readings showed effectiveness of the new design, in particular for the cooling loop system utilized on surface with heat exchange riser to maintain wellhead stack temperature below 200 degF, thus allowing safe working conditions in HT wells. The comparison between downhole tools such as normal spherical nozzles along with customized tapered nozzles with appropriate standoff shall also be discussed.

Author: Mr SINGH, Ishaan

Presenter: Mr SINGH, Ishaan

Session Classification: Poster Session