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## Abstract


**Objectives/Scope:**
Over 75% of North Kuwait reservoirs are depletion drive reservoirs requiring injection for pressure support. Until recently, dedicated wells have been drilled for Injection, or Production. With the exponential increase of Injection wells needed for pressure maintenance, and the infill drilling of Producers, finding available real estate to drill new wells has become a major challenge. Dual-purpose Simultaneous Injection & Production completions have been utilized to achieve the accelerated development at a significantly reduced Capex. The initial application of this technology has yielded excellent results, but with a few very subtle flaws that require minimal, but essential adjustment to achieve the required economic sustainability.

**Methods, Procedures, Process:**
Two (2) scenarios were considered in the dual concentric design, namely Inject above, produce below (Scenario-A), and Inject below, produce above (Scenario-B). Relative tubular movement was meticulously considered to ensure completion integrity and sustained operation in all the various operating conditions. The critical operating conditions include Inject only, Produce only, and Simultaneous Injection & ESP Production. To ensure maximum and sustained injectivity, all injection intervals were stimulated during initial completion. 5½" x 3½" tubing sizes were selected to achieve the injection and production rates required. Owing to the depth of the wells, the hook-load capacity of the conventional rigs were found unsuitable, and therefore a drilling rig was required.

**Results, Observations, Conclusions:**
With the enhanced injectivity after stimulation, greater volumes were achieved at much less injection wellhead pressures. This was considered a major reservoir management advantage, as well as a completion integrity advantage, since injection wellhead pressure was one of the key operating parameters to be controlled/limited with respect to tubular movement and pressure rating. What was unfortunately overlooked, however, was the erosional effect caused by the excessive turbulence caused at the internal diameter profile changes at the higher fluid velocities. Fluid velocity is therefore now a major limitation with existing dimensions and metallurgy. In scenario-A, however, effective gas handling became a important design consideration, since an encapsulated ESP is a major component which requires FBHP's above bubble point and/or gas venting capability. Though wellhead height was reduced to accommodate the standard substructure height within the rig fleet, the existing wellhead height still limits the rig capability, and further modifications are yet required to the wellhead and/or cellar depth to widen the rig capability throughout the entire rig fleet.

**Novel/Additive Information:** As prevailing economic conditions continue to dominate the hydrocarbon resource development strategy, it is imperative to optimize all the cost-effective solutions that will maintain a global competitive advantage. Simultaneous Injection & Production is a key technology that significantly reduces Capex and the concurrent demand for individual well surface allocation, especially in a multiple stacked reservoir environment.