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### Appraisal of key operational parameters in a large-scale steam flood pilots in Kuwait Heavy Oil field

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The first phase of development of the viscous oil resources of Kuwait is planned to be delivered through cyclic steam and steam flood technology. The objective of this study is to evaluate the impact of steam flood operational parameters (steam pressure, injection rates, steam quality) on the recovery performance, aiming to maximize oil recovery whilst lowering operating cost.

Based on a dynamic simulation model, which was calibrated with field data of the pilots, a study using a sensitivity analysis tool was conducted to evaluate steam flood operational parameters for two adjacent steam flood pilots. The model covers multiple pilots with different well spacing and depletion intervals in a common area, so that the effects of interference can be included and evaluated. An objective function of Cumulative Net Oil (CNO) has been used to evaluate the impact of various key operational parameters on the pilot performance.

Based on different sets of study cases conducted from the sensitivity analysis, it was observed that the producer bottom hole pressure is key parameter to optimize the Cumulative Net Oil (CNO) in the steam flood operation. From this study, the pilots steam flood performance (CNO) could be potentially improved from the pre-steam flood forecast base case by changing the setting of the injection rate, producer bottom hole pressure, injection bottom hole pressure and steam decline rate. In this study, the values of the CNO improved about 40% for 10-acre pattern and 36% for 5-acre pattern, respectively.

The study summarizes how the sensitivity analysis can be used to evaluate the impact of key operational parameters in a steam flood operation and to help the decision making for current and future thermal commercial projects.

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