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Updated Screening Criteria for Steam Injection Projects Based on Oil World Wide Survey

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ABSTRACT

Many of the screening criteria for steam flooding that have been described in the literature were based on data collected from EOR surveys biennially published in the Oil & Gas Journal. However, these datasets contain some problems, including outliers, missing data, inconsistent data and duplicate data, which could affect the accuracy of the results. Despite the importance of ensuring the quality of a dataset before running analyses, data quality has not been addressed in previous research related to EOR screening criteria. The objective of this current work was to update the screening criteria for steam flooding by using a database that had been cleaned. The original dataset included 1078 steam flooding field projects from around the world (Brazil, Canada, China, Colombia, Congo, France, Germany, Indonesia, Trinidad, U.S. and Venezuela). These projects had been reported in the Oil and Gas Journal from 1996 to 2014. After detecting and deleting the duplicate projects, only 221 field projects remained. To analyze and describe the results of the dataset, both graphical and statistical methods were used. A box plot and cross plots were used to detect and identify data problems, allowing for the removal of outliers and inconsistent data. After removing outlier data, a model to estimate the recovery factor were built by using the Minitab software. Histogram distributions and box plots were used to show the distribution of each parameter and present the range of the dataset. New screening criteria for steam flooding were developed based on these statistics and the defined data parameters. The developed criteria were compared with previously published criteria, and their differences are explained.

Keywords: steam, data, outlier, screening.