Paper Number 49017
Title Cyclic Steam Injection on Parallel Horizontal Wells: Geostatistical Description, Thermal Simulation and Field Experience
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Source SPE Annual Technical Conference and Exhibition, 27-30 September, New Orleans, Louisiana

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Abstract

Recent development of Bachaquero 2 Field (Lake Maracaibo, Venezuela) has been based mainly on cyclic steam injection on horizontal wells. Initial oil deliverability of the heated wells proved to be up to 5 times greater with respect to the cold wells.

This paper presents the results of a multi-disciplinary project focussed on the drilling of a pair of horizontal wells for cyclic stearn injection. The project involved a reservoir characterization and a numerical simulation phase, the drilling, steam injection and production of these wells, a data acquisition project and eventually a fial detailed simulation stage.

Experimental and numerical results show that the presence and the thickness of interbedded shale has a severe impact on heat distribution. Very little interference has to be expected between parallel horizontal wells when the separating shale is continuous and its average thickness is greater than about 12 feet. A preliminary stochastic description of the reservoir can be very useful in assessing the presence and expected average thickness of the interbedded shale.

The experience allowed us to set the best production strategy for the 2-horizontal well system, in terms of sequence and duration of the cycles, steam rate, total injected steam, steam quality and soak time. It also helped in setting guidelines for the future development of the Bachaquero 2 Field.