

Lithofacies variation of the Gachsaran Formation and its impact on the pressure regime in Abadan plain

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Abstract

The Gachsaran Formation (Miocene in age) is the efficient cap rock for the Asmari reservoir in the Dezful embayment. Also, due to the plastic characteristic, it behaves as the upper detachment during Zagros folding. In addition, the recognition of specific pressure regime of this Formation is very important and vital in casing design and mud weight. In the current study, using the subsurface data from a number of 20 drilled wells covering Abadan Plain and contiguous area, the probable control of lithofacies on the pressure regime of the Gachsaran Formation was investigated. Hence, a number of stratigraphic correlation charts, isopach maps for the entire sequence of Gachsaran Fm. and members 4, 3 and 2 was provided. The correlation charts, show that the Gachsaran Formation consists of an alternation of marl, anhydrite with some minor carbonate interbeds, but without any salt beds in the crestal part of the Azadegan paleohigh in Abadan plain. Distancing from the crestal part of the paleohigh, toward the north and northeast, due to deepening of the depositional environment gradually salt interbeds appear, first in Member 4, then in Members 2 and 3. Integrating the lithofacies and operational data reveal the remarkable control of the lithofacies on the pressure regime of the Gachsaran Formation. Among the various mechanisms, the disequilibrium compaction can be considered as the cause for overpressuring, which amplified with the plastic behavior of salt interbeds.

Keywords: *Pressure regime, Gachsaran, Abadan plain, Lithofacies variation.*