

Reservoir Monitoring Through Cased Hole Formation Resistivity Tool- A Case Study from Sobhasan Complex Mehsana Asset, Gujarat India

Saurabh Pandey, Sanjoy Das, B. K. Das, Mohan Lal, and Jai Nath Ram

Sub-Surface Team, ONGC, Mehsana Asset

spandey05@yahoo.com

Enhancement of oil recovery in mature field like Sobhasan complex requires a close reservoir monitoring of pressure as well as hydrocarbon saturation with time. In comparison to the pressure, saturation in reservoir is always been ignored. Knowledge of variation of saturation with time helps for better understanding depletion of reservoir and thus helps to decide better completion and perforation policies.

Sobhasan Field located in the Ahmedabad - Mehsana Tectonic block of Cambay basin spread over 40 Km², extends 25 km to the north of Mehsana city and upto Dholasan Village in the south. It is the 2nd largest producing field of Mehsana Asset. Sobhasan Field was discovered in 1968, since then hydrocarbon is being exploited from multilayered reservoir of Kalol, Sobhasan, BCS and Mandhali Pay Sands. Production from the field was started in 1969 @ 25 tpd, with continuous development of various oil pools/ reservoirs production from the field has touched to a peak of 1767 tpd during 1991, but in the subsequent year field experiences a continuous decline in oil production, as on date the field is producing @ 1102 tpd. Increasing water cut in peripheral wells of Kalol and Sobhasan Sand are the major reason for decline in oil production. This needs reservoir monitoring through a better and improved technology. In this regard Cased hole formation resistivity tool have been used to know the movement of OWC, identification of bypassed oil and thereby extent of depletion of reservoir. Study reveals the movement of OWC, which helps to carry out Water shutoff jobs and relook into the perforation policy adopted earlier.

The case study presented in the paper describes a successful water shutoff operations in two wells of Sobhasan field from the kalol and Sobhasan Pays and the encouraging results were achieved with substantially decrease in Watercut and increase in oil gain. Studying these wells not only resulted in net oil gain realized but also helps to decide better perforation and completion policies for the other wells completed in these sands.

In this paper, the reason in choosing resistivity behind casing, acquisition and time lapse formation evaluation to monitor present saturation profile have been discussed in details. Comparison between original and present water saturation level immediately detects the depletion zones and the degree of depletion across perforated intervals. This is considered as an indication of rise in oil-water-contact or lengthening of transition zone.