

## **Acting in Time through Logging-While-Drilling (LWD) - A Case Study in Bombay Offshore Basin, India**

**Ajay Kumar and Mohit Khanna**

*BG Exploration and Production India Limited, BG House, Lake Boulevard, Hiranandani Business Park, Powai, Mumbai – 400 076, India*

[ajay\\_ku6@rediffmail.com](mailto:ajay_ku6@rediffmail.com)

Real time formation evaluation is carried out through the basic Logging-While-Drilling (LWD) service in the carbonate field, Bombay Offshore Basin. The LWD suite includes gamma ray (GR), density-neutron porosities (RHOB-NPHI) and resistivity at different depth of investigation. In this paper, two examples of horizontal wells A and B are presented which demonstrates the utility of LWD data and real time formation evaluation. This study is focused in Panna Field which is situated ~ 100 kilometers northwest of Mumbai city and 50 kilometers east of giant Bombay High Field in Bombay Offshore Basin. The field has a thin oil rim overlain by a large gas cap, and underlain by a large aquifer, and as such is a coning dominated reservoir. Large exposure multi-lateral wells are used to improve drainage of the oil rim by reducing the tendency for gas coning and water coning.

Well A was drilled as a horizontal development well with a aim to drill ~ 431.53 m 8.5” horizontal main bore and 767.46 m 8.5” lateral within the reservoir zone to produce 800-1000 bbls at a drawdown value of < 40 psi. The other objective was to drill the horizontal section along a depth 6m above the OWC as an optimised standoff from both the GOC and OWC. This would minimise gas/water coning and maximize recovery and production. The drilling of the well started as per plan but the real time formation evaluation indicated the formation fluid as gas and as a result well was not landed at required depth. Instead, the well was drilled vertically down and to encounter the GOC which came 16m deeper than prognosed. Due to severe mud losses, drilling was terminated and the well was plugged and abandoned without any completion.

To confirm the fluid type, well was sidetracked with 8.5” BHA below the 9-5/8” shoe and 100m of formation was drilled landing at the planned depth. MDT was run to take pressure points and CFA sampling was carried out which confirmed the presence of gas. The Density-Neutron log also suggested gas in the formation.

The example shows the importance of LWD in terms of quick decision making over wire line logs which are recorded after the well is drilled up to target depth.