

Reservoir Characterization of Bassein Formation in Mukta Field, Western Offshore Basin, India

Vinay Jain and Mohit Khanna, Iti Agrawal, Rajeev Lakhera, Anurag Grover, and Ajay Kumar

BG-India, BG House, Hiranandani Business Park, Powai, Mumbai 400076

vinay.jain@bg-group.com

Mukta field is located in the Heera-Panna-Bassein (HPB) block in the western offshore basin of India was discovered in 1981 by ONGC based on 2D seismic data. The field came into production in the year 1991 from eastern part through MA platform. The field was awarded to JVs in 1995 first to ENRON and later on taken by BG in 2002.

The Middle Eocene to Late Oligocene limestone reservoirs of Bassein Formation deposited over the Panna clastic (Paleocene - Early Eocene) are the major targets as they were proven to be productive since discovery. The Bassein reservoir is the main pay horizon which has been further divided into three distinct subunits namely Bassein Upper, Middle and Lower (BU, BM and BL) separated by intervening tight zones (TZ3&TZ2).

Seismic interpretation of newly acquired 3D data has brought out the new structural style along with the identification of fault pattern in the entire seismic cube of Mukta field. Acoustic impedance derived from the seismic inversion studies has been used as a secondary variable to condition the properties (PHIT) and has been co-simulated by co-located co-kriging. Petrophysical evaluation has been carried out on the processed logs of all available wells, core studies of few key wells and reservoir parameter has been fixed based on few well test data. Poro-perm relation has been generated with limited core data and has been used for permeability modeling. Saturation height function from FWL has been made use of for creating water saturation from MB-1 core data. Based on these studies the 3D Geocellular model has been attempted for proper characterization of heterogeneities (vertical and horizontal) of Bassein Pay.

Reservoir in the Bassein B has been characterized and sweet spots in the entire field have been identified for exploitation of locked HC. The potential of three hydrodynamically separated reservoir viz. B Upper, Middle and Lower has been assessed. The static model has been used for simulation purpose to plan the development strategy within the field.