

## **Interpretation of Basal Clastic Reservoir Rock from Impedances Studies - a Case Study**

**N. K. Khatri Bhumija**

Impedance of the reservoir rocks is inversely related to the porosity. In the set up, where the sand impedance is higher than the encasing shale, impedance of porous sands is closer to the shale on impedance axis and farthest for tight sands. Basal clastic sand unit of Panna formation in Heera of Mumbai offshore basin is one such example. Shale in the Basal clastic sand (BCS) unit is characterized by a unique value of impedance. Sands in the BCS unit have higher impedance, and their presence enhances the average impedance of the unit enabling delineation of sands on average impedance scale of the unit.

Certain percentage of Chlorite clay mineral and also higher impedance minerals are reported from core studies to be present in BCS unit. Very thin streaks of shale characterized by high density and NPHI are interpreted to be given by Chlorite as clay mineral on well logs within Panna formation. Presence of minor quantity of Chlorite mineral with sand does not influence the impedance of the reservoir significantly; where as the presence of heavy minerals with sand enhances the impedance of reservoir rock.

Higher average impedance of the BCS unit above shale impedance (threshold) value is given by the presence of reservoir facies, irrespective of whether it is clean or shaly or mixed with heavy minerals and/or chlorite as clay mineral. Mapping of reservoir facies over the area from the average impedance above the said threshold value shows presence of reservoir rock all over the field and total impedance reveals its thickness qualitatively. This information in combination with the structural element helps to delineate the reservoir for exploration and exploitation.