

Modelling of Fractures Developed Due to Structural Deformation in the Karjan Prospect of Cambay Basin in India.

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The unconventional fractured basalt reservoir of the Karjan prospect in Cambay basin has proven to be promising oil plays in the area. Recent oil find in trap basalt in Karjan prospect, Cambay basin India, is an immediate motivation to understand the occurrence of oil and role of fracture distribution. Paper describes the method adopted to characterize the discrete fracture systems within the basalt for hydrocarbon accumulation as unconventional trap.

The seismic data used to map the top of trap surface and a reflector below the surface guided by the events with varying continuity to generate a volume of trap strata in Karjan prospect. This volume is utilized for forward modelling to analyze deformation attribute, using geo-metric and geo-mechanical restoration work flow of structural modelling software.

From the mapping of faults it is found that area has undergone tectonic stress in two directions. This has defined number of fracture sets.

The restoration process calculates stress and strain attributes. These attributes are used for fracture modelling to define two sets; This has worked as a dip and azimuth constraint for 3D Discrete Fracture Network (DFN) of defined fracture sets. The paper analyses and presents the result of fracture modelling. The workflow used for fracture modelling can be used by petroleum industry to define spacing, density and orientation of the various fracture systems. The optimal modelling results will depend upon appropriateness of geometries adopted for restoration and constraining parameter of fracture system. The discrete fracture network model generated is a direct input for Simulation Model for further study and to generate the field development model.