5283 Understanding Wrenched Structures in Kuwait Bay Using 3D Visualization Techniques of 2D Seismic Offshore Data, Kuwait Bay

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For many years Kuwait offshore remained almost uninvestigated mainly due to more emphases on onshore Exploration. This study launches a new phase of Oil and Gas Exploration and aims at trapping Hydrocarbon in the offshore.

An old vintage of sparse 2D seismic data was acquired 1996 and used to assess Kuwait Bay offshore hydrocarbon potential at shallow targets (early and middle Cretaceous) as well as deeper reservoirs within the Jurassic and Paleozoic sections.

Kuwait Bay is geographically delimited by Bahra, Sabriya and Raudatain fields from the north and to the prolific Burgan arch from the south. Kuwait bay prospects comprise wrenched four “three way closures” connected by series of sinistral and dextral strike slip faults. The structures are a result of large-scale transpressional movement associated with a number of Mesozoic and Cenozoic tectonic events overprinted on an earlier Infracambrian structural framework (basement attached).

The four “three way closures” of Kuwait Bay envisaged to be trapping Hydrocarbon from the offshore and NW kitchens migrating up dip towards Bay area, by getting juxtaposed against major vertical left lateral barrier strike-slip fault that is parallel to the coast line of the Bay.

Delineating and mapping highly compartmentalized high prolific Kuwait Bay lead was the most challenging part of this study especially by picking shear faults of low quality mistied 2D seismic data. The ability, within visualization interpretation techniques of interpolating the faults between the 2D lines played a big role in understanding the structural framework of Kuwait Bay and relating it to analogous strike-slip faults on existing fields in North, south and west Kuwait.

Understanding the fault genesis has highly been improved by animating through paleo- structuration and basin filling scenario's. The resolution and quantification of the faults required the integration of all available data including quantitative fracture analysis from image data, core, wireline logs. 3D basin modeling was constructed by integrating the output of the 3D seismic data to assess the prospectively of the Bay area.

New offshore exploratory wells are be drilled in near future by KOC. Successes on drilling and testing these wells will validate the detective stories behind Kuwait Bay prospect generation.