SEAPEX Exploration Conference 2001
Orchard Hotel, Singapore
4th – 6th April 2001

Abstract No : 1A4/2001
Author(s) : AHM Shamsuddin
Company Affiliation : Unocal Bangladesh Ltd

PETROLEUM SYSTEMS OF BANGLADESH

Bangladesh is one of the largest deltaic basins in the world with proved gas in place volumes of more than 25 TCF. Only 63 exploratory wells have been drilled (primarily in the onshore and offshore areas of eastern Bangladesh) to date in an area of 207,000 sq. km area with a maximum sedimentary section exceeding 20 km, making Bangladesh one of the least explored countries in the world.

Nevertheless, 22 gas discoveries and 1 oil discovery have yielded an extremely high success rate (37%). This is the result of favorable geological conditions that have prevailed in different stages of basin development since the early Paleozoic. The tectonic movements resulting from the collision between the Indian plate and Eurasia plate to the north and between the Indian and Burma plates to the east have provided favorable conditions for the development of the petroleum system elements of trap, source, reservoir, seal and migration.

Five petroleum systems can be postulated in Bangladesh. Because exploration activities have been concentrated in the eastern part of the country, only two petroleum systems are known to be active, including the Jenam-Bhuban-Bokabil gas-condensate Petroleum System of the Surma Basin and the Bhuban-Bokabil gas Petroleum System of the Hatia Trough. Both of these petroleum systems are characterized by Plio-Pleistocene to Recent compression and folding. In the Surma Petroleum system, the known reservoirs are in the upper and middle Miocene sandstones with the hydrocarbon source rocks primarily from the middle Oligocene Jenam shales that generated natural gas with condensate yields as high as 20 BBL/MMcfg. In contrast, the Hatia petroleum system contains reservoirs in the upper Miocene to Pliocene sandstones with gas generated by Miocene Bhuban shales with little or no condensate.

The other petroleum systems that have yet to be confirmed in western Bangladesh, characterized by extensional tectonics, include the Gondwana petroleum system in the Bogra shelf of western Bangladesh, where generation of gas from Gondwana coals has been documented. The proposed Paleocene-Eocene Cherra-Sylhet-Kopili and Oligo-Miocene Barail-Surma petroleum systems are considered to be active in lower shelf-slope and slope-basinal areas. The potential reservoirs of these petroleum systems could occur in upper Cretaceous through Miocene sediments with sourcing from marine Paleocene to Oligocene sediments. Stratigraphic play types are the major exploration targets in western Bangladesh.

The impressive 37% wildcat success rate provides strong support for the ongoing drilling program in Eastern Bangladesh and areas to the west and south, which holds the potential for the discovery of even greater hydrocarbon resources. The challenges of Bangladesh for the 21st century are to evaluate the petroleum potential of western Bangladesh and the unexplored vast offshore areas up to 2000m water depth, as well as to explore the possibility of deep oil in the Surma Basin.