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EXPLORATION ACTIVITIES IN AND AROUND THE SANGU GAS FIELD, OFFSHORE BAY OF BENGAL

The Bengal Basin, Bangladesh, was developed during the Mesozoic, as a rift basin on the northern margin of the Indian continental plate. The northerly migration of the Indian plate, towards the Himalayan subduction zone, initiated a large foredeep basin, which filled with a series of southerly prograding Cretaceous-Pleistocene deltaic and fan deposits.

The Ganges-Bhramaputra Delta has, arguably, the highest sedimentation rates of any delta system in the world. The sediment load is estimated to be approximately 1670 million tons/year, depositing a clastic pile of sands and muds in excess of 12 km thick. Sediments are distributed over an area of approximately 105,640 sq. km, with a low angled slope of 0.08 m/km and an average tidal range of 3.5m. The sedimentary pile comprises a monotonous succession of tidal sands, tidal muds, punctuated by large tidal bars/ridges and marine shales. In the subsurface (Offshore Bangladesh), wireline log correlations and sand body predictions are notoriously difficult owing to extraordinarily high sedimentation rates and high frequency autocyclicity, combined with the lack of zonal marker fossils (as a result of shallow palaeo-water depths, salinity variations and water turbidity).

Shell's exploration campaign, together with, partners Cairn Energy Plc. and Haliburton Resources are at present focused on gas exploration in Blocks 15 and 16, Offshore Bangladesh, within the Mio-Pliestocene sediments of the Ganges-Bhramaputra Delta. Shell has just completed an extensive, transition zone, seismic acquisition program and is midway through a vigorous exploration, drilling campaign, aimed at testing several large multi-Tcf structures.

Sangu Gas Field, Block 16, Offshore Bangladesh, lies in 10 metres of water. The gas field lies in the southeastern fold belt of Bangladesh, comprising a 90 sq. km north-northwest to south-southeast trending anticline, with gas reserves trapped in Pliocene-Miocene tidal sands and mudstones. Sangu Field comprises over 11 stacked reservoirs with different gas water contacts from 1860m – 3870m.

The trapping configuration is essentially a four-way dip closure, complicated by deep submarine channel incision and faulting. The field was discovered by Sangu-1, in February 1996. The subsequent appraisal well, Sangu-2, confirmed the continuity of the main reservoirs with volumes in place exceeding 500 Bcf and discovered additional gas accumulations in deeper reservoirs. The main reservoir flowed gas at a maximum of 51 MMscfd. Other heterogeneous reservoirs, comprising thin laminated sands and shales, were also tested with a maximum flow rate of 31 MMscfd.

Deeper gas bearing reservoirs are also currently being appraised within overpressured zones down to 5 km and are likely to add significant additional reserves.