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## Constraining Geological Heterogeneity in Offshore Sarawak Field, East Malaysia: Implications for Stochastic Modeling

The article has been abridged. See the *Bulletin* Web version for the full abstract and images: [/www.hgs.org/2005/April](http://www.hgs.org/2005/April)

D18 field is located about 20 km offshore from the coast of Bintulu, on Borneo island of East Malaysia. The field is located in the oil-rich Balingian province, at about 100 ft of water. Regional and local structural elements define the field to be about 40 sq.km in area, with approximately 1400 ft relief in the structure top of main reservoir unit (Cycle 2). A preliminary review of data and previous work and core descriptions in this study led to identification of key factors in the distribution of hydrocarbons. Eighty percent of oil has been produced from distributary channels and mouth bars of "Cycle 2" unit (C2M3.0–C2M3.4). Although exploration efforts started in 1920 in Balingian province, D18 hydrocarbons were discovered in 1981, with the first discovery Well D18-1, drilled on crest of roughly WNW–ESE trending anticline. Development drilling and previous field reviews divided the field into 21 fault-bound blocks separated by an interconnected fault network. Production declined over 19 years, with many wells currently idling. Preliminary data analysis, geochemical reports and RFT measurements in the field suggest that D18 field is vertically and laterally heterogeneous. A comprehensive re-evaluation of geology is considered before any further development activity.

D18 structure is one of the WNW–ESE trending anticlines formed as a result of transpressional tectonics in the Tertiary foreland basin, formed due to southward thrusting of Rajang oceanic crust under West Borneo basement. The sediment source for the Sarawak basins in general is believed to be Rajang Group, an accretionary prism formed as a result of subduction of Luconia block of South China Sea under the West Borneo basement.

Sequence development is related to simpler rules that govern the net effect in accommodation. A tentative high-resolution sequence stratigraphic model, constrained by biostratigraphy and palynology is constructed, which enabled a chronostratigraphic framework for reservoirs despite the intense deformation of stratigraphic units. Majority of the production is coming from the transgressive systems tract (C2M3.0–C2M3.4 reservoirs) below the mid-Cycle 2 Maximum Flooding Surface (MFS).

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### Biographical Sketch

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from Indian Institute of Technology, Kharagpur (1984) and MS from Texas A&M University (1997). He worked with ONGC, India, as Exploration Geologist, Fugro as Offshore Geohazards Specialist, and Landmark Graphics-Halliburton as

Consultant. In the last two years his work is focused on South East Asia. As Principal Consultant to Petronas-Carigali (Malaysia) on offshore brownfield assessments, he was responsible for revising the geology and sequence stratigraphy, revising and building reservoir models, and assessing hydrocarbon potential of fields in South China Sea.

He is an active member of AAPG, SEG and HGS. As a member for Continuing Education Committee of HGS he has organized several courses covering topics such as coal bed methane, geopressures and reservoir modeling.