

MAJOR CONTROLS ON DEEPWATER RESERVOIR DISTRIBUTION, WEST AFRICA

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The study of major controls on deepwater reservoir distribution, West Africa was mainly focus on the risk factor associated with reservoir sandstones in the deepwater areas of West Africa covering Cameroon, Equatorial Guinea, Gabon, Congo and Angola. Based on previous unsuccessful exploration results by Petronas up to 2006, it was found that the main factor for this is due to poor understanding of reservoir distribution in the region. This study was carried out to gain a better understanding on the geology of West Africa, particularly with regards to the transport and delivery of sediment from onshore to deepwater areas along the West African margin. This involves a study of the margin evolution both onshore and offshore areas. The primary objective of the study was to improve the understanding of sediment supply to the basins offshore West Africa, with the aim to enhance the prediction of reservoir distribution and quality. Understanding the entire sediment distribution system from source to sink is fundamental to improve models of reservoir distribution and quality. The hinterland analysis allied to a review of offshore data, can significantly enhance the fundamentals of this source to sink sediment distribution system.

The main deepwater reservoirs in the West Africa offshore areas are the Cretaceous and Tertiary turbidite channel and fan deposits. Major controls on deepwater reservoir distribution, are a combination or interplays of regional tectonics, eustasy, sediment supply, climates and intra-basin salt tectonism. West

Africa experienced a complex tectonic history from Cretaceous to Tertiary and several important events have been identified to play important roles in controlling the reservoir distributions. The connection of the Congo system to the Ogooué is the most significant event in drainage organisation and long term sediment supply evolution as observed in modern geomorphology. The shelf review identified numerous channels and erosion features which further supported the shelf sediment bypass to the deep water. This explains why most deepwater reservoirs in West Africa are found within Late Cretaceous to Tertiary strata. The most prolific basin for hydrocarbon exploration in West Africa margin is Lower Congo Basin which contains the Tertiary Congo Fan deposits, followed by Gabon Basin. Kwanza and Namibe Basins have many potential occurrences which yet to be proven by major discoveries or development.

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