

High-Resolution Seismic Sequence Stratigraphy Study in Deep Water Reservoir Block M-11, Myanmar Exploration

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Abstract

Block M-11, Offshore Myanmar is located in the Moattama basin, which is approximately 300 km from Yangon and close to Zawtika Production Area at Block M-9. The water depth ranges from 200 to 2,000 meters. Modern bathymetry was extracted from 3D seismic data and showing that Block M-11 is situated on the continental shelf to slope. Observation from regional seismic data also shows that the continental shelf might develop since late Miocene time. Therefore, seismic sequence stratigraphic was studied in order to understand the depositional process related to sea level change and further to identify the reservoir potential area. However, the post stack seismic data is inadequate to detail study of sequence stratigraphy because of poor data quality and low seismic resolution. Therefore, the objective of this study is to improve seismic resolution and imaging quality of geological features. The determining which frequency is possible to distinguish the seismic features has significant implications for reservoir development. Moreover, it looks for the potential plays for successful future exploration of the Pliocene-Pleistocene strata of the Moattama basin.

The new stratigraphic sequences in the study area has been interpreted and updated by using same seismic stratigraphic principles. Forestepping and downstepping reflectors are observed in both model of stratigraphy. Forestepping is interpreted as an indicator of producing high sediment supply and proximal subsidence. The down stepping reflects continued high sedimentation rates with decreasing accommodation space. In addition, downstepping may produce forced regression. In the basin with a reasonable shelf and slope system downstepping will encourage fan development.

Based on this study, the best possible reservoir distributions in the study area should be in the lowstand deposits, channel-levee, sediments deposited on slope and fan system within FM4 and Intra-FM5. These zone has potential sands deposited with high net to gross sand values (As the result of Well-A and Well-B). Another area that may have good reservoir distribution is in the incised valley fills which deposits when the sea level falls and subsequence sediment supply infills the valleys. These can be recognized by seismic character at several sequence boundaries.