

Cenozoic Rift Basins and Deformation of Offshore Southern Myanmar, Andaman Sea; the Seismic Data Tells the Story

Tad Choi¹ and Claude Rangin²

¹PGS Kuala Lumpur, Malaysia

²Emeritus researcher Nice University (France) and GEOTECTO Consulting

Abstract

Detailed interpretation of PGS MultiClient 2D data in the greater Andaman Sea area, as well as data in public domain data reveals a series of Cenozoic rift basins from North Sumatra Basin in the south, through various basins in Thailand, India and Myanmar, as well as the highly complicated collision front between India and the Eurasian Plate. Multiphase rifting can be observed within these Cenozoic basins as well as wrench type deformation, related to strike-slip tectonics. The nature of the collision between India Plate and the Sunda continental craton (Sundaland) has been heavily debated in recent years, but with the availability of high quality seismic data, and the nature of deformation that is clearly seen on seismic, it is very evident that classic subduction does not take place presently.

In the West Andaman Sea (Andaman Nicobar Ridge and the Andaman rift, which opened within the Alcock-Sewell Ridge) the acoustic basement is similar to the one identified along the 90°E Ridge. Some seismic lines reveal E-W continuity between these two units without a main trench or thrust planes that could be attributed to an active subduction. Along the Andaman Nicobar Ridge, Cenozoic sediments are detached from its basement and folded disharmonically. When flattened, seismic sections reveal these sediments are thinning upslope on both sides of the Ridge. Main depocentres are located West and East of the ridge with similar thickness correlation. This is similar to the 90°E Ridge sediments overlapping both flanks of this high. The Andaman Nicobar Ridge is considered as an elongated tectonic sliver of the 90°E Ridge, recently accreted to the Sunda Plate.

The Andaman Rift generally interpreted as a young spreading center is actually filled by thick sedimentary packages separated by various unconformities. No oceanic crust was observed, but the same acoustic basement we see at the Andaman Nicobar Ridge is present. This basement rises rapidly on both flanks of the Alcock and Sewell Rises. The Andaman Rift is interpreted as a N50°E trending Mesozoic rift, reactivated during the Cenozoic. It could be compared to the NE-SW trending saddles observed in bathymetry and free air gravity along the 90°E Ridge. This suggests the Andaman Rift and Alcock Sewell ridges are also fragments of Indian ridge docked and accreted to the Sunda margin.

The objective of this paper is to show the industry the importance of real data versus hypothetical models. The old subduction models for this area without the support of real data kills the hydrocarbon prospectivity, as subduction would imply cold and immature. However, this study reinforces that there is no subduction and there exists thick Cenozoic sediments and basins with potential for a working petroleum system, in the deep waters of southern Myanmar, Andaman Sea area.