



Stretching factors in Cenozoic multi-rift basins, western Gulf of Thailand

Chanida Kaewkor (1,2) and Ian Watkinson (1)

(1) Department of Earth Sciences, Royal Holloway University of London, Egham, United Kingdom, (2) Department of Mineral Fuels, Ministry of Energy, Bangkok, Thailand

The Gulf of Thailand (GoT) is the biggest petroleum producing province in Thailand. It is separated by the north-south trending Ko Kra Ridge into two main parts: the Western Area and Basinal Area. A series of horsts and grabens formed by north-south oriented extensional faults subdivides the GoT into a number of basins. The two major basins, Pattani and North Malay, are located in the Basinal Area that contains the main oil and gas fields. The Western Area comprises several smaller and shallower basins but has nonetheless resulted in commercial successes, including oil fields such as Nang Nuan (Chumphon Basin), Bualuang (Western Basin) and Songkhla (Songkhla Basin).

The GoT is one of several unusual Cenozoic basins within Sundaland, the continental core of SE Asia. These basins have previously been characterized by multiple distinct phases of extension and inversion, rapid post-rift subsidence, association with low-angle normal faults; and are set within hot, thin crust similar to the Basin and Range province, but surrounded by active plate boundaries. The extensional faults systems play a major role in petroleum accumulation during syn-rift and post-rift phases in this area.

This paper utilises well data and 3D seismic data from the Songkhla and Western basins of the western GoT. Structural balancing and restoration techniques are used to investigate the rate of extension and the effect on tectonostratigraphy. The basins are younger to the north, the Western basin was opened in Upper Oligocene to Lower Miocene. Stretching factors of the Western basin is approximately 1.1-1.2. Songkhla basin is the oldest basin that initial rift started in Eocene. The basin is dominated by major structures; western border fault, compressional structures related reactivated inversion fault, and inter-basinal faults. There are two main phases of tectonic activity; 1) Rifting phase which can be divided into three sub-extensional phase; Eocene, Oligocene, Lower Miocene. 2) Post-rift and subsidence from Middle Miocene to Recent. Stretching factors of Songkhla basin is approximately 1.2-1.4.