

## **Seismic Stratigraphy and Structural Evolution of Petroleum Prospects in the Eastern Esarn Area, Northeast Thailand: Implication for Petroleum Prospects**

**T. Mahattanachai and A. Suwannathong**

*Department of Mineral Fuels, Chatuchak, Bangkok, 10900, Thailand*

### **ABSTRACT**

The Mukdahan prospect is in Mukdahan Province in eastern Esarn in northeast Thailand. In this paper, several techniques for modern seismic interpretation which are widely used in petroleum exploration were included to this study as well as integration of well data to complete a geological concept. Result of sub-surface study, using three wells drilled within this area (Mukdahan-1, Khampalai-1, and Huai Muk-1) and seismic data, reveals an opportunity to find substantial amount of gas and possibility to develop petroleum field commercially three prospects, including the Mukdahan, the Kham Palai, and the That Phanom. In term of petroleum aspects, though, petroleum potential of this prospect remains uncertain, an active petroleum system was proved by petroleum discover in concession block B5942/32, done by Unocal. The Mukdahan prospect is presently classified as tested, successful potential prospect. Sub-surface data reveals that the Mukdahan Prospect is situated on the crest of the Mukdahan Anticlinorium which could be observed the deformation of the Mesozoic Red-Bed Succession (the Khorat Group) from both sub-surface and surface geologic expression. Structurally, the Mukdahan Prospect was complicated by series of deformed structures, caused by periodically activation of both local and regional tectonic through time. Below the Base Khorat Unconformity, the lower section of the Mukdahan formed a Triassic Half-Graben, which underlain by seismic reflection free strata. Whereas Triassic Strata was observed from the seismic profile in Mukdahan Structure, the That Phanom structure which located up to the north, shows an evidence of east extension of carbonate section underneath the Mesozoic Khorat Strata. Considerably, the carbonate play is recently a proved, commercial play in the northeastern part of Thailand which could provide additional gas deliverability and turn the marginal field at the eastern part of Esarn area into commercial gas field.

**KEYWORDS:** Mukdahan prospect, northeast Thailand, Seismic Stratigraphy

