SEAPEX Exploration Conference 2003
Orchard Hotel, Singapore
9th – 11th April 2003

ABSTRACT

Author(s) : James W. Turner, Steven P. Lambert
Company Affiliation : Unocal Thailand

ERAWAN: LOOKING BACK THROUGH 30 YEARS OF GEOLOGIC THINKING.

Erawan, named for a mythical 3 headed elephant, was discovered in January 1973 with one of the first wells drilled in the Gulf of Thailand. Our ideas concerning the geology of both the field and the Pattani Basin have changed greatly as more wells were drilled and more seismic was shot. Today, over 400 wells have been drilled in Erawan.

Little was known about the stratigraphy of the basin when the discovery well (12-1) was drilled. Early investigators merely speculated that subsidence initiated in the Cretaceous Period. Even the limits of the basin were poorly understood. Maps published in the early 1970s show a single, large basin in the Gulf of Thailand, known as the Thai Basin. Today, Erawan field is recognized to lie within the Pattani Trough, one of a number of elongate north south trending basins in the Gulf of Thailand. Drilling has revealed these basins are filled predominately with non-marine sediments of Tertiary age. Early maps of the Erawan structure show a simple anticline with few faults. Three-dimensional seismic later proved that the field was intensely faulted.

Failure to recognize the extent of the faulting before initial field development nearly resulted in disaster for Union Oil (now Unocal). Production began to decline almost as soon as the first wells were brought on stream, and the company was forced to write reserves down from 1.6 to 0.6 trillion cubic feet of gas. The field was returned to profitability by drilling innovations, which reduced the cost of development wells from 5 to less than 1 million dollars. Today proven and probable reserves stand near 3 trillion cubic feet.

Currently the Erawan structure is mapped as an elongate trend of synthetic and antithetic normal faults that is commonly referred to as a graben trend. Gas is trapped through a combination of structural and stratigraphic factors. While technically correct, the use of the term graben trend has led to misconception about the evolution of both the field and the basin. Most authors have referred to the Pattani as a rift basin, and an early rift origin of the basin is clearly evident on

seismic lines. However, most of the productive reservoirs were deposited during a period of regional sag, an interpretation that is supported by isopach mapping and the structural configuration seen on regional seismic lines. Thus the productive trends should more accurately be depicted as hinge trends.

Thirty years have passed since Erawan field was discovered, but the elephant has a long life yet to live. Twenty-one well head platforms have been installed, but at least fifteen more are planned to fully develop the field. Ample opportunity exists to continue to challenge our geologic thinking.