
Technology application to sustain exploration success

DATO' KARL F. SWENSEN
Esso Production (Malaysia) Inc.

Exploration in the Malay Basin began over 25 years ago, when regional geologists realized that a deep sedimentary basin could lie beneath the South China Sea. Since the very beginning, the application of improving technology has been integral to the discovery of over 1-1/2 billion barrels of oil in the basin.

The existence of a sedimentary basin with oil potential was recognised by Esso explorers during the mid 60's when aeromagnetic surveys were conducted over the area. The first Offshore Petroleum Licence for the Malay Basin was awarded to Esso in April 1968. Later that year, Esso recorded its initial seismic survey, on a widely spaced, regional grid, which showed a maximum sediment thickness of over 10 km, as well as a broad trend of anticlines within the centre of the basin. Esso spudded its first exploration well,

Warta Geologi, Vol.17, No.6

Tapis-1, in May 1969, and since then has drilled 186 exploration wells in the Malay Basin. 22 major oil and gas fields have been discovered within the 1976 PSC area, and during the last 18 months, 5 oil fields in PM-5/8.

During the initial phases of Malay Basin exploration, the most obvious prospective targets were identified and evaluated. The current exploration phase is requiring a much more intensive application of the best geoscience technology to sustain exploration success. Prospects are smaller, more subtle, structurally more complex, stratigraphically more variable, and spread out over a larger area than the oil fields found during the 70's. To address these problems, EPMI will record over 60,000 km high resolution 2-D and 3-D seismic during the first three and a half years of PM-5/8 exploration. This compares to 28,000 km of 2-D data that EPMI recorded in the Malay Basin during the 10 years prior to 1978, when oil started to flow from the basin.

Technology has improved substantially during the past 25 years, in the areas of basin geological analysis, seismic acquisition and processing, seismic modelling, drilling, formation evaluation, sequence stratigraphy and, of course, computing. All these advances have enabled the explorationist to develop an increasingly clear picture of the subsurface. Some new techniques have contributed significantly, but in most cases the key has been incremental improvements in the integration of new and existing technology in an environment of progressively smaller and more difficult to find discoveries. Included in this, are the improvements being made in the way we carry out our business through organizational effectiveness and team building.

The Malay Basin still holds significant undiscovered oil potential, but this will be much more difficult to find than in the past. The challenge is to discover and develop this potential in a cost-effective and efficient manner. Technological breakthroughs cannot be completely relied upon for future discoveries. Instead, rigorous, integrated application of existing and new exploration tools will enable future successful explorers to unlock the basin's remaining secrets.