INTRODUCTION

Petroleum exploration in the Gulf of Thailand has been active since the Government, in early 1968, granted to six oil companies the right to explore for, and produce, petroleum in 17 exploration blocks. Two additional blocks were granted in 1972 to one other company. Drilling activities were not started until the promulgation of the Petroleum Act and Petroleum Income Tax Act on March 26, 1971. Up to mid-1973, seven exploratory wells had been drilled, two of which had substantial shows and discoveries of oil and gas in Tertiary strata at depths less than 10,000 ft (3,000 m).

Many major and minor closed structures suitable for hydrocarbon accumulation within Tertiary sections beneath the Gulf were located by geophysical means. Because of the presence of these structures, 15 additional wells were scheduled for late 1973 and 1974. As of May 1974, six wells were completed, and gas and condensate were found in two of them.

In addition to the concessions in the Gulf, the Government granted petroleum concessions in the Andaman Sea off the west coast of Thailand; four blocks covering the shallow water were awarded to three oil companies in 1971 and 1972, and three deeper water blocks were granted in May 1974 to three companies and one consortium. No wells had been drilled on these blocks to mid-1974.

REGIONAL FRAMEWORK

Land Areas

Thailand is flanked on the east by the Indochina massif and on the west by the Himalayan belt. Three major physiographic and geologic provinces are recognized (Fig. 1): (1) Paleozoic-Mesozoic folded belt of the Thai-Malay Peninsula in the west, (2) Cenozoic Chao Phraya depression in the central region, and (3) Mesozoic Khorat plateau in the northeast.

The main structural trend of the Thai-Malay Peninsula is north to northwest. In peninsular Thailand the strike changes along the west side of the Gulf (about 9°N lat.) to a northeast trend and then back to a northwest trend onshore near the head of the Gulf. The folded belts, resulting chiefly from the late Paleozoic Hercynian orogeny but modified by the Tertiary orogeny, persist for many kilometers with little observable axial plunge (Brown et al., 1951).

Granite masses, evident in long, linear outcrops in the peninsula, are dated as Late Cretaceous—early Tertiary (Burton and Bignell, 1969). Four major ridges are recognized from west to southeast (Fig. 1): (1) Phuket Ridge, extending through Ranong and Kanchanaburi provinces; (2) Satun Ridge, extending to Ko Samui; (3) Ko Kra Ridge; and (4) Narathiwat Ridge.

The Tertiary orogeny, which formed the present physiographic features, probably closed with Wallachian (late Pliocene) movements, which caused the uplift of the Mesozoic Khorat plateau in the northeast, the compensatory subsidence of the Chao Phraya depression in the central region, and fault-block tectonism in the north with associated basalt intrusions (Brown et al., 1951).

The late Miocene folding and volcanism were responsible for the formation of the three major fault zones: the Klong Marui, Ranong, and the Kwae Noi faults (Fig. 1).

The Chao Phraya depression occupies an area of about 60,200 km² (140 by 430 km) and consists of thick Tertiary-Quaternary alluvium and deltaic deposits above an irregular basement. The Chao Phraya, Tha Chin, Mae Klong, and Bang Pakong are the main rivers transporting sediment to the Gulf. The delta progrades an average of 4.5 m/yr (Brown et al., 1951).

Seafloors

Gulf of Thailand—A shallow, flat basin with maximum water depth of 86 m, the Gulf extends from the Chao Phraya deltaic plain near Bangkok southeast about 800 km. Its mouth is defined as a line between the southwestern tip of the Mekong (birdfoot) delta and a small island off the east coast of the Thai-Malay Peninsula near 6°N lat.

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