BIMA FIELD, INDONESIA, A SLEEPING GIANT

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ABSTRACT

The Pertamina/ARCO Bima field, 50 miles (80 km) north of Jakarta, Indonesia, traps over 1 billion barrels of oil in Neogene carbonate and clastic reservoirs. The Bima structure was first drilled in 1974, but ZZZ-1 tested poorly, was abandoned, and the field was considered to be a noncommercial stratigraphic accumulation. Numerous reinterpretations finally provided reason to retest the structure, and ZU-1 became the discovery well 9 years after the first test.

About two-thirds of the field's 100 million barrels of primary recoverable reserves are within a northward-thickening wedge of Miocene Batu Raja Limestone. Additional pay is in the deeper, fractured portion of the Batu Raja and in thick, clean Talang Akar sands above basement gullies.

The northern third of the field is being developed from seven, nine-slot platforms. Development will include several horizontal wells to increase productivity and reduce the chance of gas coning. Production start-up is expected in late 1986 and phase one development is to be completed by July 1987. Peak production should be about 55,000 BOPD. The crude will move to the Pertamina/ARCO P flow station via a 45-mi (72-km) pipeline.

INTRODUCTION

The Pertamina/ARCO Bima field is a shallow subgiant at the north end of the Seribu Platform, 50 to 60 mi (80 to 96 km) north of Jakarta, Indonesia (Figure 1). The Seribu Platform is a broad, shallow basement high that dips gently northward from west Java. It adjoins the Sunda Basin to the west, where a maximum of 14,000 ft (4270 m) of post-middle Oligocene sedimentary rocks were deposited. The contact between these two provinces is the Thousand Islands fault zone. North-east of Bima the Seribu Platform rapidly dives into the North Seribu Trough, an Oligocene/Miocene half-graben containing 9000 ft (2745 m) to 11,000 ft (3355 m) of sedimentary rocks. This geological setting was conducive to the generation, migration, and entrapment of several billion barrels of oil and a significant amount of gas.

Bima field is one of the larger discoveries in the Pertamina/ARCO Offshore Northwest Java Production Sharing Contract. About 100 million barrels of oil and 70 billion cubic feet of gas are thought to be recoverable by primary production methods. The field is about 10 mi (16 km) long, has a productive area of 25 mi² (65 km²), and is full to spill point.

Wildcat well ZZZ-1, drilled in 1974, was the first well to test the Bima high and might have been the discovery well had the structure, stratigraphy, and fluid characteristics of the reservoir hydrocarbons been understood at that time. ZZZ-1 just caught the downdip northern flank of the field, tested poorly from the Batu Raja Limestone, and was abandoned as a well with oil shows. The true significance of this well was unknown for another 9 years until the ZU-1 well "rediscovered" the field in November 1983.

This paper details the exploration history of the field as many factors that contributed to the delay between the drilling of ZZZ-1 and ZU-1. The geological history of the primary reservoirs is discussed, and development plans and drilling results through March 1986 are summarized.

EXPLORATION HISTORY

The first Indonesian offshore production sharing contract was awarded in August 1966 to the Independent Indonesian American Petroleum Company (IIAPCO). The Offshore Northwest Java Contract area consisted of some 13.4 million acres in the Arjuna, Jatibarang, and Sunda basins (Figure 2). IIAPCO assigned operatorship to Sinclair Oil in 1967 while retaining an interest in the acreage. Drilling began in 1968 and Atlantic Richfield Indonesia, Inc. became operator the following year upon merger with Sinclair Oil. The concession's first oil discovery, E-1, was found in the Ardjuna area in January 1969. The next 3 years saw an active exploration campaign, appraisal drilling, and development of the E and B discoveries.

Early ARCO successes in the Ardjuna Basin were primarily lower to middle Miocene Cibulakan Formation discoveries (Figure 3). IIAPCO, operator in the adjacent Southeast Sumatra Production Sharing Contract area in the Sunda Basin, was making significant discoveries at this time in the Oligocene