

Bekapai Field: An Old Field That Refuses to Die

Supriady¹, Yan Muhazir¹, and Untung Ashari¹

¹Total E&P Indonesia, Indonesia

ABSTRACT

Bekapai is a mature oil and gas field located in the offshore Mahakam Delta, Indonesia. The hydrocarbons are accumulated in complex multilayered reservoirs fluvial-deltaic deposits. The shallower parts are dominated by channel deposition with strong aquifer support and the deeper parts are dominated by bar deposition with weak aquifer support. The field is divided into 3 panels by 2 major faults, with west panel being the most contributing area and east panel as the least developed. Ten platforms were constructed to accommodate the oil production coming from 74 wells drilled between 1974 and 1996 as part of the initial field development. The production was started in 1974 with peak production at 60,000 bopd in 1978, followed by a period of decline until it reached its lowest point at 1,000 bopd in 2007.

Presumably as the last effort to rejuvenate the field, a field re-development Phase 1 was initiated in 2007 consisting 9 development wells, 1 exploration well to appraise the east panel, and gas production facility debottlenecking. It turned out to be a success milestone by increasing the production to 10,000 bopd and 46 MMscfd by the end of 2013.

The Phase 1 results also brought new geological understanding of the field such as: faults locations, fluid contacts, and the un-swept area which leads to an opportunity for further development. Following the geological model updates, a new 3D OBC seismic was acquired in 2012 to support the subsequent development, Phase 2. It was proposed in 2013 consisting 10 production wells and a new gas line installation to accommodate higher gas production. Two wells were drilled in 2014 and contributed in stabilizing the field production of 2014 at 11,500 bopd and 38 MMscfd. It was the highest oil production of the past 25 years. In 2015, the results of 3D OBC seismic interpretation started to take role in the field development by improving the structural scheme interpretation and more accurate fault location. The locations of the six wells drilled in that year were optimized accordingly. In 2016, the field marked another milestone by producing 14,000 bopd and 100 MMscfd.

In addition to drilling new wells, hidden gas potentials in the idle wells are also reviewed as additional feeder to the field production and gas-lift gas source to revitalize the oil wells. Four wells were successfully revived with this method and more candidates are being reviewed for future application.

This paper presents the efforts that were put in place in order for the field to have its successful new life cycle through: continuous update on the geological understanding involving new 3D OBC seismic data and new wells data, good reservoir management in a complex reservoir system, and various production network optimizations in order to unlock the production capacity limit.

As a relentless effort from Bekapai team, a full field review is now once again conducted for searching another opportunity to find the remaining sweet spots in the core area and exploit the less developed area notably in central panel, east panel, and shallow zone.