

TOTAL'S Experiences in Tackling Mature Field Challenges in The Mahakam PSC

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ABSTRACT

The core of challenges in mature field management is a tale of mismatch between two trends – increasing needs as a result of reservoir maturity, and decreasing means due to degradation of asset integrity. Typical outcomes of this incongruity are declining production, weaker economics of new projects, more complex surface constraint, and decreasing reserves of new wells. Further complications may occur as consequence of external factors such as volatility of oil and gas price, new regulations, contractual conditions, and logistic constraints.

Mahakam Block has been in operation for over 40 years, and the aforementioned challenges are getting more evident as most of the fields become mature. The story of Mahakam began with the development of oil fields in 1974 when Bekapai was put into production, followed by Handil field a year after. The shift from being oil producer to mainly gas producer occurred in 1990 when Tambora and Tunu fields were started-up. In 2007, the production of Sisi-Nubi gas fields which are located at more distal area of the Mahakam Delta commenced. Most of the fields are becoming mature except for South Mahakam fields (Stupa, Mandu, Jempang and Mentulang) which were started-up in 2012. As of early 2017, Mahakam is still the biggest gas producing block in Indonesia and has produced nearly 19 trillion cubic feet of gas along with approximately 1.5 billion barrels of oil. The complexity of the operations can be portrayed through the vast number of drilled and producing wells of over 2,000 and 700 wells respectively. In consequence, maintaining the continuously maturing Mahakam assets requires tremendous efforts and investments.

This paper shares TOTAL's experiences in tackling mature field challenges in Mahakam on a field basis due to the uniqueness of every field. No single solution is available in the sense that each field requires distinctive strategies. Tunu main zone, for instance, succeeded to maintain its plateau through lowering network pressure, reducing costs by lighter well architecture, and lowering well spacing in order to re-access disconnected reservoirs and find smaller new reservoirs. Meanwhile, re-development has been undergone by Handil and Bekapai fields through implementation of pressure maintenance, new EOR screening, 3D seismic and intensive drilling. Additionally, Bekapai field has gone through gas debottlenecking projects including construction of new gas pipeline that doubled the gas rate capacity to 100 MMscfd. These re-developments managed to boost both the oil and gas recovery factors of Handil and Bekapai fields.

In the end, this paper is concluded by the elaboration of recommended best practices in prolonging the life of mature fields. Revamping mature assets through major risk assessment, data management to improve database, and optimization of the quality and quantity of personnel is crucial prior to envisaging innovative technologies as it is risky to implement innovative techniques on degraded installations. Moreover, being aware and prepared to anticipate external factors is important since those factors are getting more sensitive as the assets mature. Lastly, it is emphasized that distinctive evaluation and actions for each asset are the key to ensuring the continuation of Mahakam story.