

# Monetising Value of Early Gas Cap Blowdown (GCBD)

A. Mohd Mokhdhari, N. Mohamed Khirol Amin, K.A. Buang, V. Drahaman, ExxonMobil Exploration and Production Malaysia Inc.

## Abstract

Gas cap blowdown (GCBD) strategy is traditionally deployed after the total field's oil production has been depleted. Such project requires intensive planning to assess the economic feasibility and operational benefits considering the challenges associated with mature fields. This paper describes the milestone undertaken in pursuing gas cap blowdown ahead of oil depletion in Field Y by focusing on value-driven study and approval process. The initial step in a value-driven study is to identify reservoir with limited remaining oil production potential, shown by high recovery factor estimates and a consistent production sandwiching effect from observed high gas-oil and water-oil ratios. In reservoir J of Field Y combination methods of compositional simulation and material balance calculations are applied due to the high remaining gas volume and high condensate yield reservoir. A compositional simulation model integrated with Peninsular Malaysia gas network model was built and utilized to quantify the remaining volumes in-place and forecast incremental gain with gas blowdown. Several development scenarios leveraging from multi-phase Joint Technical Study with PETRONAS were evaluated to determine the best techno-commercial development plan for this reservoir and economics assessments were run to compare all viable options. As a result, an early gas cap blowdown development scenario is the most optimum way forward while continuing the oil production from remaining active producers. A total of 9 wells were planned for workovers to support the gas cap blowdown of Field Y Reservoir J. A robust well design philosophy is applied to convert horizontal oil producers into gas producers, while maximizing the surface facilities utilization. Continuous reservoir monitoring was also planned through contact logging and installing downhole pressure gauges at 4 of the GCBD wells. Admirably, the recent well test shows better than expected rates for both gas and condensate on all wells that have been worked over. In summary, applying the above value-driven strategy for mature assets helped ensure efficient gas cap blowdown maturation and execution ahead of oil depletion. Collaboration and continuous alignment with the regulator and partner are also a key factor in ensuring the enablement of early gas cap blowdown. Field Y represents one of the earliest instances of co-existing crude and gas cap production. Through strategic utilization of existing facilities and minimal surface modifications to overcome backpressure, the team ingeniously leveraged available resources and successfully transforms the asset to become the foremost gas producer in Peninsular Malaysia.