AAPG Datapages/Search and Discovery Article #90315 ©2017 Asia Pacific Region GTW, Oil and Gas Resources of India: Exploration and Production Opportunities and Challenges, Mumbai, India, 6-7 December, 2017

Optimizing Of A Shallow Marginal Offshore Field In Se Asia

Kumar Satyam Das[1] and Murali Raghunathan[1]

[1]Shell India Markets Private Limited

ABSTRACT

This note discusses the feasibility of field development of a challenging shallow offshore field in SE Asia and how its learnings can be applied to marginal field development in India. The field was found to be economically challenging and the project was put on hold. Shell started development study with the aim to significantly reduce cost through competitive scoping and revive stranded projects. The proposed strategy to achieve this involved a) Improve Per platform recovery and b) Reduction in CAPEX (facilities and wells).

Methodology
Based on various Benchmarking Tool such as Woodmac for similar projects in the region and economic affordability, a challenging target of 50% reduction in UDC was set for the project. The technical scope was defined to the minimum as to be a wellhead platform with minimum functionality to ensure production. The evaluation of key project decisions like Well location and number, well design, Artificial lift methods and wellhead platform type under different development concept was carried out through an integrated multi-discipline approach.

Improve per platform recovery
The key elements influencing the per platform recovery were Wellhead Platform (WHP) location, Well count, well reach and well productivity. The reservoir being shallow posed challenges in well design (dog-leg severity, casing size and the achievable step-out), choice of artificial lift and sand-control method. Integrated approach amongst relevant disciplines with challenging mind-set enabled to achieve optimized set of development decisions. This led to significant improvement in per platform recovery. It was concluded that Platform recovery largely depended on the reach of the well. Choice of the slim well design enabled designing of high inclination and better productivity wells. However, there is a trade-off between high inclination Gas Lift (GL) wells and low inclination ESP wells in terms of long term value, operational complexity, well reach, recovery and uptime.

The sweet spot was identified using combination of saturation, surface constraints maps such as coral and WHP and reach was obtained through optimising the well location and integrated discussion with subsurface and well engineering team.

Reduction in CAPEX
Well design element like casing size, well completion, artificial lift and sand control were added successively over the MTS design leading to a value and risk staircase. Logical combinations of options (slim well, Standalone Screen, GL) were competitively screened to achieve 25 % reduction in well cost. Facility cost reduction was achieved through sourcing standardized (industry standard) Low Cost Facilities platform in combination with portfolio execution to maximizing execution efficiency; this approach is expected to reduce facilities cost by ~23 % with

respect to the FDP costs. Further cost reductions were achieved by maximizing use of existing facilities nearby; changing reliance on existing water injection wells and utilizing existing W.I. platform for new injectors.

Conclusion

The study provides a spectrum of technically feasible options. It also made clear that different drivers lead to different development concepts and the cost value trade off staircase made this very visible. Scoping of the project through competitive way has proven to be valuable for decision makers by creating a transparent view of value and associated risks/uncertainty/trade-offs for difficult choices: elements of the projects can be competitive, whilst other parts will struggle, even though contributing to significant volumes.

The reduction in UDC through proper scoping of the present project paves as learning for the development of marginal fields in India.