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# Successful Optimization of a Shallow Marginal Offshore Field and Its Applications

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**Abstract :** This note discusses the feasibility of field development of a challenging shallow offshore field in South East Asia and how its learnings can be applied to marginal field development across the world especially developing marginal fields in this low oil price world. The field was found to be economically challenging even during high oil prices and the project was put on hold. Shell started development study with the aim to significantly reduce cost through competitively scoping and revive stranded projects. The proposed strategy to achieve this involved Improve Per platform recovery and Reduction in CAPEX. 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 unit development cost (UDC) was set for the project. 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 integrated multi-discipline approach. Key elements influencing per platform recovery were Wellhead Platform (WHP) location, Well count, well reach and well productivity. Major Findings: 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 slim well design enabled designing of high inclination and better productivity wells. However, there is trade-off between high inclination Gas Lift (GL) wells and low inclination wells in terms of long term value, operational complexity, well reach, recovery and uptime. Well design element like casing size, well completion, artificial lift and sand control were added successively over the minimum technical scope design leading to a value and risk staircase. Logical combinations of options (slim well, GL) were competitively screened to achieve 25% reduction in well cost. Facility cost reduction was achieved through sourcing standardized 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 development costs. Further cost reductions were achieved by maximizing use of existing facilities nearby; changing reliance on existing water injection wells and utilizing existing water injector (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. Reduction in UDC through proper scoping of present projects and its benchmarking paves as a learning for the development of marginal fields across the world, especially in this low oil price scenario. This way of developing a field has on average a reduction of 40% of cost for the Shell projects.

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