SPE 154073 Application of Integrated Production and Asset Modeling for Sour Field Development Planning

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This paper describes the structure of modelling; surface components, optimisation strategy, benefits and challenges of IPM deployment to choose an optimum field design. The results from this study highlight the importance and value of field management in addition to the accuracy and speed of the production forecast.

The model which had been created was to create an IPM forecasting workflow and decision making philosophy to develop two complex sour fields made up of three reservoirs. Two of these reservoirs are sour oil with different PVT, H2S concentration and drive mechanisms while the third reservoir is a sour gas condensate reservoir used to complement the associated gas for constant exported gas rate.

The main objective for this project was to optimise the development of the system by assessing the best design for the surface network.

The system consists of; 3 reservoirs, 19 oil producing wells, 3 gas producing wells, 12 water injectors, 1 production station, 3 separators (low, medium and high pressure) and several flowlines of different sizes. The scope defined for this system was to design the optimal station capacity to handle the produced fluids, size of gas compressors and to optimise the artificial lift.

Integration of various engineering disciplines was achieved by linking MoReS to GAP, allowing the following to be achieved:

- Optimised oil recovery and NPV
- Understanding of individual reservoirs contribution
- Reservoir allocation between different owners
- Optimised gas compression capacity
- Design station capacity
- Phasing of wells to achieve plateau production
- Evaluate the impact of varying the injection rate on reservoir performance
- Optimising water lift

Conclusion:

The integration of GAP with MoReS resulted in effective and reliable tools being used for; decision making, forecasting and economic evaluations which stimulated cross-function and multi-disciplinary discussions.