SPE 144195 Real Time Production Optimisation in the Okume Complex Field, Offshore Equatorial Guinea

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This paper addresses real time production optimisation (RTPO) by implementing a digital framework using several available commercial applications (IPM and IFM) with respect to the Okume complex field in offshore Equatorial Guinea. There are two primary challenges; gaslift is continuously allocated in frequently changing field conditions while minimising production losses as well as understanding and maximising the field production plateau. The operators on the field are required to maintain and increase mature asset production by optimising the artificial lift system and managing the well operating constraints which requires a deep understanding of the well performance. A full picture of the well performance comes from the well test validation and updates as well as accurate well rate estimation and volume allocation. These steps take a large amount of time out of the engineers' day and away from the technical work to carry out the necessary repetitive tasks. There is therefore a need for tools or methodologies which can continuously provide optimisation settings for the asset. RTPO also assists operators in better understanding the gap between the potential and actual production and helps to identify the potential changes in the process operations.

Benefits

- Implementation of IFM reduced the time required for data gathering and model updating which would originally have taken 2-3 hours and now takes a few minutes. A more consistent approach in the maintenance and storage of the IPM models was also achieved.
- The smart well rate estimation algorithm (WRE) and adequate operational choke control were applied to the Okume complex and facilitated the smart well zonal testing and production surveillance system which provided a strong basis for asset awareness as well as proper leverage of the expensive downhole control devices.
- Daily production optimisation reduced the gap between the actual performance and the optimised expected performance by around 5.1%.
- Oil production has been stable and maintained close to its peak due to the improved gaslift optimisation workflow.

Conclusions

- RTPO platform was successfully deployed using commercially available tools and they are now in the validation stage by the asset. All initial expectations have been met and the first year's lessons have been captured and documented.
- IFM provides a means to improve IPM models, update efficiency, speed and consistency. The time required for a well test validation was reduced by 70% and IPM models are now continuously updated.
- Continuous zonal allocation was achieved for the intelligent wells while the smart well rate estimation algorithm which was applied resulted in greater asset awareness level of potential crossflow in zones and the appropriate management of the downhole control devices.

- IPM models are now frequently continuously used in the decision making process and to generate improved asset production opportunities.