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Successful Implementations of Integrated Asset Modeling

PETROSTREAMZ - GLOBAL EXPERTS IN INTEGRATED ASSET MODELING

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Abstract

Oil and gas production systems are complex and usually consist of several production elements and corresponding models: (1) reservoirs modelled with reservoir simulators using geological and fluid data, (2) wells and surface production networks modelled with flow assurance applications, (3) surface processing facilities modelled in process simulators and (4) economic models. The traditional approach ("silo" approach) consists of modelling each part of the system independently from the others without considering upstream and/or downstream interactions. Integrated Asset Modelling (IAM) is a maturing solution incorporating effects of all the elements of an asset. This paper shows the benefits of successful IAM implementations in four highly complex and technically challenging assets around the globe.

IAM aims to bring together all models of the value chain, from the reservoir to the point of sales. It enables us to perform numerous sensitivity analysis by changing any parameter across the value chain and investigate its influence on the entire system. The presentation concludes with guidelines and best practices for IAM implementation. It especially focuses on three very important issues faced when dealing with IAM: (1) software and model integration, (2) PVT consistency across the value chain and (3) optimization.

Several case studies from the industry are used as illustration: diluent injection optimization for a heavy oil field in the North Sea, integration of reservoir and process models for a complex offshore multi-field asset in Indonesia, production allocation for an onshore multi-field asset in South America and API blending optimization for a multi-field asset in Middle East. The different case studies show that benefits of implementing an IAM approach can be significant and immediate: higher production, lower OPEX or better information for further CAPEX.

In the current market situation, IAM approach is a cost-effective solution to optimize oil and gas production. By bringing together existing information and models from all parts of the production system, IAM breaks barriers between disciplines and enables an asset-scale overview that leads to more informed decision-making and ultimately higher profits for operators.

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