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Uncertainty Analysis and Management in Integrated Studies: Example from a Brown Field Onshore Niger Delta

The nature of the subsurface and limitation of subsurface data makes uncertainty analysis and management an integral part of integrated study workflow. Integrated study deliverables-volumes, forecasts, optimal development plans, etc. are intrinsically influenced by uncertainties and how such uncertainties are handled is fundamental to any integrated study work. Various methods are available for handling both static and dynamic uncertainties. These methods range from statistics to geostatistics, from probabilistic to deterministic approach.

Scenario based approach is generally the recommended approach for handling static and dynamic uncertainties in an integrated study. In an unconstrained world simulation of identified scenarios is ideal. However, time and resources constraints are realities of the E & P business.

In this paper we present a pragmatic scenario based uncertainty handling approach for integrated studies. The approach involves – integration and analysis of all available subsurface data at study kick-off, identification, impact assessment and ranking of all likely subsurface uncertainties and the development of a fit for purpose, focussed uncertainty management strategy for the uncertainties that has significant impact. This method allows the team to decide early, on how best to handle the uncertainties-sensitivities or full alternative scenario modelling. It also allows for re-ranking of uncertainties as the study progresses.

The benefits of this approach are that it allows for better data integration, reduction in integrated study time and provides a roadmap for achieving study deliverables without jeopardising quality.