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## Kikeh Development: Delivering World Class Completion Performance

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### ABSTRACT

The Kikeh Development is the first major deepwater project in Malaysia, located offshore Sabah in 1,320m water depth. This 34 well oil development includes Dry Tree Unit (Spar) and subsea producers as well as gas and water injectors.

The Kikeh Field architecture, as well as its subsurface characteristics, required many different completion types to meet the project goals. Early wellbore construction design and rig selection focused on performance while still achieving subsurface strategic requirements. Throughout the design and implementation, many challenges were met in upscaling suppliers to meet deepwater completion needs and managing multiple external interfaces. Great emphasis was placed on working as many activities as possible offline. In addition, lessons learned were captured and implemented immediately, thereby shortening the learning curve impact.

This paper will discuss how these early decisions benefited long-term performance and will describe the grassroots effort for deepwater completion implementation in a new region of the world. Lastly, focus will be on the completion performance, including time, non-productive time and skin describing methodology and techniques used to deliver the Kikeh Development with world-class time and skin results.

### INTRODUCTION

The Kikeh Field architecture consists primarily of a Dry Tree Unit (Spar), three subsea manifold sites, FPSO and a pipeline system. The wells include 16 subsea wells and 18 dry trees which were drilled and completed by two different rig types. The field's wells and facilities are designed for peak production and injection rates of 120,000 BOPD and 260,000 BWPD respectively. *Figure 1* is an illustration of the field layout and its components.

Completion operations play a major role in the overall Kikeh deepwater development with 25 percent of the total field development CAPEX and 58 percent of the well CAPEX attributed to the well completions. In addition, aggressive production and injectivity skin targets were set as the development thresholds to successfully achieve peak targets. At various levels, the completion design and execution interfaced with each of the facility components and was driven extensively by the subsurface characteristics to optimize production, injection and reserve recovery. The following subject matter discusses the steps taken from design through field execution that were the basis for achieving remarkable results at Kikeh.

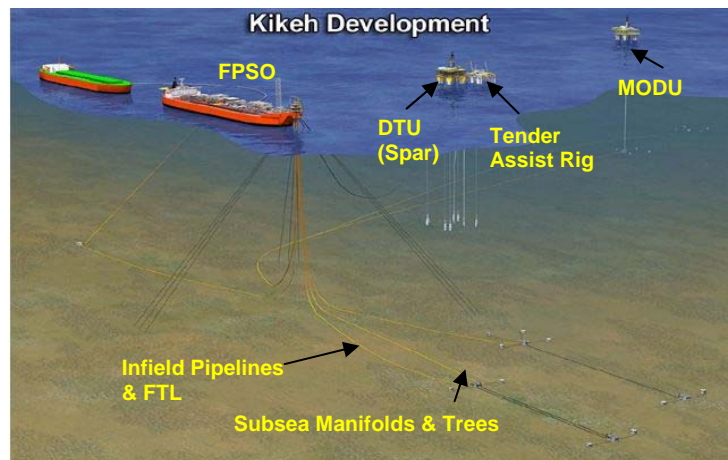


Figure 1: Kikeh Field Architecture