

An Inventive Development Strategy in Sisi and Nubi Fields Undeveloped Area

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Abstract

Sisi and Nubi Fields are mature gas fields located in offshore Mahakam Delta, East Kalimantan, Indonesia. These fields have been delivering 1.5 Tcf of gas and 39 MMstb of condensate, with total 89 development wells have been drilled and put on production until the end of 2022. Existing development strategy was focusing in the crestal area which have been heavily produced and saturated with wells, hence production sustainability in the Sisi and Nubi Fields is compromised by the current decline in production rates and the reserves limitations. This paper aims to outline the inventive development strategy in undeveloped area of Sisi and Nubi Fields with utilization of multi seismic attributes data and integration of static and dynamic analysis.

The current methodology for identifying and characterizing reservoir targets relies primarily on static and dynamic synthesis, geomodeling approach and extensive well correlation. Nonetheless, this approach is limited to existing development areas, leaving the untapped area uncertain and lacking sufficient data to be developed. Consequently, the progress of further development has been impeded as there is a delay in obtaining static and dynamic data solely from the existing wells.

The implementation of seismic multi-attributes analysis also integration of static and dynamic analysis and well data as input, provides valuable insights on gas reservoir within Sisi and Nubi Fields, expanding the coverage of gas identification and characterization outside current development perimeters. Synthesizing the correlation among subsurface data, a comprehensive understanding of subsurface synthesis has been achieved, particularly in the west area of Sisi and Nubi Fields, an undeveloped area with limited well data.

The identification of gas reservoirs was effectively accomplished, yielding a comprehensive catalog of geobodies with a substantial hydrocarbon volumetric accumulation in the western area of Sisi and Nubi Fields. A meticulous derisking process, involving structural location, contact analysis and geobody orientation was undertaken to ensure the presence of gas reservoir. This led to a widespread distribution of gas reservoir geobodies across the western region of Sisi and Nubi Fields. Stacked of gas reservoir geobodies was subsequently subjected to cone analysis to determine the most optimum location for offshore platforms and well trajectory analysis to maximize hydrocarbon production.

The implementation of this approach is poised to be an inventive stride in Mahakam and the broader petroleum industry. Resulting potential identification on further development areas beyond existing perimeters, increased chances of success and ultimately sustain the production of Sisi and Nubi Fields.

Keywords: field development, data sciences, seismic multi-attributes, subsurface synthesis, derisking process