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Drilling and Completion Innovations Deliver World-Class Results in Angola

C.J. Williams and S.S. Wilson, ExxonMobil Development Co.

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Abstract

The purpose of this paper is to describe the innovations that have helped deliver best-in-class results on Esso Exploration Angola (Block 15) Ltd.'s (Esso's) drilling activities. The actions taken by the drill team have resulted in safe and environmentally sound operations that allowed production rate goals to be met or exceeded and reduced costs. These benefits have been achieved through the successful application of 1) a centralized functional organization that maintains critical personnel continuity and promotes proven practices transfer; 2) work practices that allow us to apply available technology effectively and to invent technology when required; and 3) the "Design One, Build Multiple" concept, which enabled our tension-leg platform (TLP) personnel to share best practices and build upon prior successes. Exceptional results have been realized in the entire cycle of our well construction process, from the initial installation efforts through the drilling, completion, and ongoing production operations.

Introduction

Esso and its Coventurers acquired the license for Angola Block 15 in August 1994. We began drilling exploration wells in September 1997, discovered commercial quantities of petroleum the following year, and subsequently named the development "Kizomba A." By 1999, Esso and its Coventurers had discovered more than 1 billion barrels of oil. By December 2000, thirteen exploration wells and four appraisal wells had been drilled in Block 15, with nine newly announced discoveries.

As with many new start-ups, getting the right people involved early was critical. Our Angola Block 15 team benefited greatly from the identification and assignment of critical personnel from the Hoover-Diana drill team to key positions within our Angola Block 15 drill team.

During the concept selection phase, the development drill team was intimately involved in the decisions to complete the Kizomba A and B fields with a TLP concept and the Xikomba

field with subsea architecture. These decisions were reached to reduce the total life-cycle cost of the development by allowing future reduced-cost interventions on the TLP wells while delivering the Xikomba development as efficiently as possible.

The exploration and development planning drill teams collaborated to ensure that lessons learned during the exploration/appraisal drilling program were applied to the detailed design phase. This cooperation allowed the teams to rapidly apply proven practices and drill the wells as efficiently as possible. The drilling and completion of the Kizomba A, Xikomba, and Kizomba B wells proceeded very efficiently and resulted in our team delivering the wells faster than our competition. See Figures 2 through 8. Our performance demonstrates the ability to transfer learnings from one project to the next as our learning curves from project to project are accelerated and enhanced.

The Angola Block 15 drill team had the primary goal of delivering the optimum number of high-performing, long-life wells to meet the early production and injection requirements. As shown in Table 1, we have met our project goals on all Angola Block 15 projects started up to date.

	<u>Kizomba A</u>	<u>Xikomba</u>	<u>Kizomba B</u>
Number of wells planned for first oil:	14	5	12
Number of wells available for first oil:	14	5	12

Table 1. Angola Block 15 Well Counts

Esso delivered the desired wells to our Coventurers and the host government on schedule or ahead of plan. Our team achieved these goals by establishing clear priorities and delivering results every day.

Safety Performance

Esso transformed itself into an affiliate capable of producing in excess of 550,000 barrels of oil per day by delivering three world-class developments in record time, from discovery to first oil. Esso has held for many years the commitment that no job is to be performed unless it can be done safely.

Our outstanding drilling safety record on Block 15 has been achieved through our drilling supervisors' dedication to promoting safety as a core value and truly believing that all accidents are preventable with the proactive and supportive involvement of all drill team members (employees and drilling contractor and service company personnel).