

The promise of West African offshore

Judy Maksoud

OWA conference examines expanding frontiers

A torrent of E&P dollars is pouring into West Africa. Analysts agree that the region will not only see the lion's share of deepwater investment in 2005, but that it will see a large increase in capital expenditure over the next four years.

As fields in the Gulf of Guinea and offshore Angola move into production, new exploration is taking off in areas such as São Tomé & Príncipe. Exploration drilling is planned offshore Morocco, and the first exploration wells have been drilled offshore Tanzania.

The ninth annual Offshore West Africa conference, which will take place in Abuja, Nigeria, March 21-23, provides a forum for information and technology exchange in a region that is at the forefront of deepwater development. The conference theme this year is "Expanding Frontiers."

The conference includes more than 45 presentations that address subjects germane to the region. Topics range from lessons learned in field development to early production techniques, from production optimization and field architecture to flow assurance, and from project financing to maximizing local content.

The papers summarized here are a sample of the technology mix that will be presented at this year's conference.

Early production in deep waters

Mats Rosengren

Frontier Drilling do Brasil Vitoria

Early production in deep and ultra-deep waters could employ a dynamically positioned (DP) FPSO as an alternative to conventional turret moored and spread moored FPSOs. Today's technology for early production has proven DP FPSO production methods offshore Brazil in 2,500-m water depth.

An early production system (EPS) can reduce the time from discovery to first production. An EPS can also determine well stream evidence and reservoir characteristics to handle challenging crude properties of low API grade and high viscosities to declare a field commercial and to plan for a life-of-field production system. In the early production phase, attractive cash flow can contribute to field development funding.



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The DP FPSO Seillean has been operating offshore Brazil since 1998.

There are challenges associated with converting a tanker to a DP FPSO for deployment in deep and ultra-deep waters. The analysis presented here is based on six years of proven deepwater early production experience from the DP FPSO Seillean, operating offshore Brazil since 1998.

The concept examined, converting a tanker to an early production DP FPSO, has been named Seillean 2. It is a second-generation Seillean for early production with the option to outfit the FPSO to perform light well intervention and workover services. The proven and unparalleled concept is applicable to West Africa among several other deepwater areas worldwide.

Discoveries in deep and ultra-deep waters historically take several years from discovery to first production. An early production system can reduce the time frame from discovery to production. Converting an existing tanker vessel to a DP FPSO can provide a fast-track solution to early production in deep waters.

Recent heavy crude discoveries in deepwater demand solutions for handling low API grade crude, high viscosities, and contents as sulfur and acids. Uncertainties of well stream evidence and reservoir characteristics make it difficult to design and optimize a life-of-field production system without first deploying a test and early production phase to obtain the required data.

Since 2002, experience offshore Brazil has proven that heavy crude can be produced in deepwater, and new ventures are underway to make efficient production of crude with difficult properties in deepwater.

The Seillean is a DP 2 redundant FPSO equipped for test and early production operations to 2,000 m of water.

The vessel is self-contained with a full-size derrick to handle the rigid production riser and subsea equipment, resulting in very fast mobilization and demobilization times.

Crude offloads to a shuttle tanker via a flexible hose between the two vessels. With a few modifications, the FPSO can be upgraded to operate in 2,500 m of water.

The Seillean 2 concept is built on operating experience from the operating DP FPSO Seillean and is based on a conversion of an Aframax size tanker with 1 MMbbl crude oil storage capacity when trading as a tanker. The concept Seillean 2 also takes into consideration the ability for the FPSO to be equipped to perform other services than test and early production.

The analysis carried out to evaluate the DP FPSO deepwater early production concept indicates that a DP FPSO is a viable option. □

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