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DALIA, BLOCK 17, ANGOLA

Dalia was discovered in 1997, 135km offshore in water depths of between 1,200m and 1,500m. The launch of Dalia, which is due on-stream during the second half of 2006, is a key step in the development of Block 17, where 15 earlier discoveries have been made. It follows the development of nearby Girassol, brought on stream in late 2001, and Jasmim, a Girassol satellite.

By repeating Girassol but on a much larger scale and under even more extreme conditions, Dalia will boost production on this 'golden block' to around 500,000bpd. In total, the development of the Dalia project represents an estimated investment of \$3.4 billion.

The concessionaire of Block 17 is Sonangol. TotalFinaElf has a 40% interest in Block 17 along with Esso Exploration Angola (Block 17) Ltd. (20%), BP Exploration (Angola) Ltd. (16.67%), Statoil Angola Block 17 AS (13.33%) and Norsk Hydro (10%).

DEVELOPMENT

The Dalia development plans calls for production from the field's three main reservoirs, as well as the adjacent Camelia reservoir. These were formed more than 25 million years ago by the accumulation of sediment at the mouth of the Congo River. Today, they lie not very far (about 800m) below the seabed, forming reservoirs that contain a viscous (between 21° and 23° API) oil at relatively low temperatures of between 45°C and 50°C. Associated gas will not be flared but reinjected, thus contributing to maintaining the pressure of the field.

Together with the other Block 17 partners, the group has designed one of the largest deep-offshore developments anywhere in the world. This is based on a subsea production system of 67 wells - 34 production wells, 30 water injection wells and three gas injection wells - with an option to extend to 71 bringing additional reserves.

These are being drilled with two rigs, *Pride Africa* and *Pride Angola*, in tandem for the initial 18 months of the campaign of which will require some 2,500 days in all.

PRODUCTION

Plans envisage 21 of the 67 wells on-stream by first oil, including 5.5in and 7in completions, seven smart completions and horizontal drains extending for an average of 1,100m. The wells are highly deviated, i.e. they are almost horizontal in the reservoirs. One major aspect of the well programme is the large-scale use of horizontal Christmas trees designed to allow wells to be drilled through them.

The wells will be tied into nine manifolds feeding 40km of 12in production lines in four production loops; eight flexible risers using Integrated Production Bundle (IPB) technology taking the fluid up to the surface facilities; four 35km of 12in water injection lines and risers as well as two 10km of 12in for the gas. There will also be 75km of umbilicals.

DALIA FPSO

The FPSO vessel for Dalia will constitute a second pole of production on Block 17. Capable of processing 240,000bpd, the Dalia FPSO will also have a storage capacity of 2 million barrels of oil.

The FPSO vessel, built in South Korea, has a hull dimension of 300m in length, 60m in breadth and stands 32m high. On top of this will be 29,400t of topsides, including I-tubes.

It will have a water injection capacity of 405,000bpd, water treatment capacity of 265,000bpd and gas compression capacity of 8MMscf/d. There will be a total installed power capacity of 66MW.

The living quarters will hold up to 120 people and up to 190 during shut-downs. The structure has a design working life of 20 years.



The launch of Dalia is a key step in the development of Block 17, offshore Angola.



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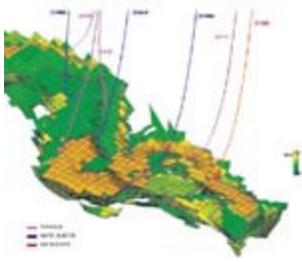


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Dalia reservoir plan.



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