



ExxonMobil: Configuration Design

Kizomba is located in Block 15 off the Angolan coast, West of Africa. The water depth at this location is in the region of 1300m. In total the field encompasses 4 distinct reservoirs that will be developed with 2 separate facilities, namely Kizomba A and Kizomba B. The work performed here was conducted for Kizomba A.

Kizomba A infrastructure will consist of a Tensioned Leg Platform (TLP), a Floating, Production Storage and Offloading Vessel (FPSO) and Oil Offloading Lines (OOL) to a remote moored CALM buoy structure. The TLP facilitates production from the reservoirs through use of a number of Top Tensioned Production risers. The produced hydrocarbons are transferred to the FPSO for storage and treatment by means of a series of Fluid Transfer Lines (FTLs). Produced crude is exported from the development at periodic intervals through the OOL system to a CALM buoy.

Saibos, EPIC contractor for the FTLs and OOLs, awarded the contract for supply of the flexible pipe FTLs to Wellstream. Wellstream subcontracted the global analysis of the FTLs to MCS Kenny.

The environment West of Africa is characterised by long period swell and short period local sea. In general the environment is more benign than that associated with typical development in either the Gulf of Mexico or North Sea although swell periods are close to vessel natural response periods. As such the design of the FTLs was driven, not by the extreme event, but by the need to maintain serviceability issues such as interference and fatigue within permitted limits.

Scope of Delivery

- MCS Kenny performed an iterative FTL interference study to identify most suitable FTL configuration and dynamic lengths
- MCS Kenny performed extreme dynamic analysis of the FTL assembly to assess the FTL performance with respect to Wellstream pipe design criteria and relevant regulatory documents; API17J, API17B
- MCS Kenny applied a state of the art frequency screening approach, to screen and identify most onerous response of the FTL pipe system
- Detailed verification of the interface bend stiffener designs was performed by MCS Kenny
- MCS Kenny analysed the global fatigue load cases of the FTL system, which formed the basis for Wellstream's local cross sectional fatigue analysis.

Benefits

- MCS Kenny and Wellstream engineers worked closely to effectively manage all aspect of the FTL riser configuration design to ensure a safe and efficient design. Consequently the flexible pipe FTL riser configuration design was completed on schedule
- Where design alterations occurred, this relationship enabled changes to be incorporated and verified within a tightly constrained schedule.