



Client
Puma Energy



Location
Luanda, Angola



Period
June 2014 – April 2016

Luanda Fishing Port – PLEM and Pipe pull, Pipeline Repositioning

Puma Energy is currently constructing an onshore tank farm in the Bay of Luanda, Angola. PMI was appointed for the design and installation of a CBM (Catenary Buoy Mooring) system in order to service the on-shore terminal. Installation works included, amongst other, PLEM and pipe pull operations (2x20 inch steel lines, 800m offshore). The CBM terminal was designed to accommodate tankers ranging from 15 000 to 225 000 DWT.

PMI Scope of Works:

- Site investigation works, incl. vibrocore, seabed CPT, jack-up barge boreholes.
- Design, specification and engineering of complete offshore pipeline system, manifold and CBM. (CBM ABS certified.)
- Procurement and project management of works.
- Subsea piping and marine works including:
 - 5.8x5.8m PLEM (piled subsea.)
 - 2x20in steel pipelines 19.1mm thickness (approx. 800m each) installed via bottom drag pull.
 - Hydrostatic pressure testing of entire offshore piping

system and pigging (gauge and swab pigs)

Phase 1 – PLEM and pipe pull:

Following minor adjustments to the CBM detail design in December 2015 the construction project was divided into two phases. The first phase included the onshore assembly and welding of the 20inch pipeline segments. Following the successful installation of the 8 anchors, buoys and chains - the 2x20inch pipeline strings, placed upon rollers with PLEM acting as pulling head, were pulled via bottom-drag to its design location 800m offshore. The first pipepull operation phase was completed within programme and allowed the Client a timely commencement to start trading product.

- Start of pipepull - end of March 2015.
- Pressure testing and pigging successfully completed second week of April 2015.
- Total duration – approx. 3 weeks.

Phase 2 – Pipeline Repositioning:

Following the construction of a new quay wall and dredging works (separate contract for which PMI acted as construction supervisor) the second phase commenced where the onshore end of the pipeline was disconnected and repositioned to a recessed location inside the quay wall. The pipeline was dragged by PMI and re-aligned following a number of

calculated repositioning maneuvers. Once the pipeline was in final position PMI conducted a sophisticated underwater tie-in operation to the pre-fabricated risers connected to the quay wall via brackets.

- Start of repositioning - end of March 2016.
- Second phase handed over – end of April 2016.
- Total project duration including installation, prefabrication, pressure testing – approx. 4 weeks.

PMI Responsibilities:

PMI was responsible for the design, specification and engineering of the complete offshore pipeline system and manifold. PMI was responsible for all marine works and conducted the site supervision during the prefabrication works on-site.

