

MARLIN DEVELOPMENT PROJECT
IVORY COAST

PIPELINE PROTECTION

Product: ACBM (articulated concrete block mattress) SARMAC® mattress, MacBags

Problem

Foxtrot International, planned to develop the Marlin reservoir in the Ivory Coast utilizing a new fixed platform. The production from the new Marlin platform will be exported to shore through two new pipelines. The new platform will also be connected to the existing Foxtrot A (FA) platform through two new infield transmission pipelines.

These pipelines will normally be 'in-reserve' and will only be utilized as back-up if either platform has a major equipment or pipeline failure. The figure opposite is a schematic representation of the platforms with the transmission and export pipeline network that would be established.

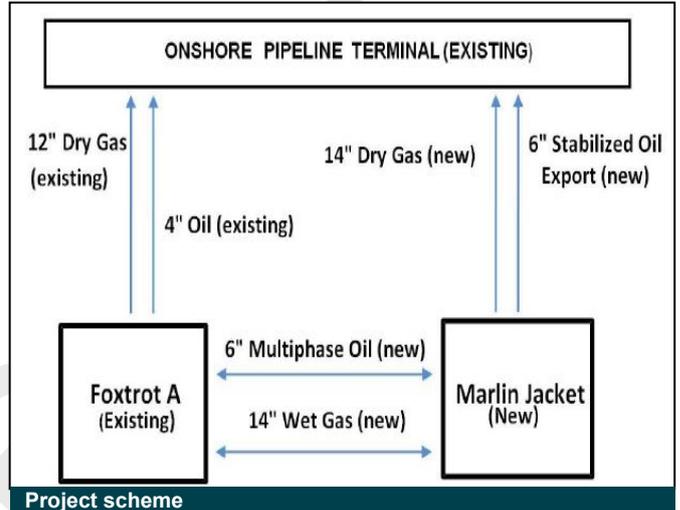
Project Facilities

The purpose of the project is to enable drilling activities either with tender assist rigs, process, meter and export the production fluids. The works comprise:

- One 4-legged lifted jacket with skirt piles to be installed in approximately 110 m water depth, with associated appurtenances such as piles, boat landing, navigational aids and 4 pre-installed lead sections of conductor pipes
- Four pre-installed pipelines risers on Marlin plus two new risers to be installed on Foxtrot A
- One 4-legged deck including oil processing equipment, gas processing equipment and compressors, living quarters and appurtenances
- Two pipelines (6" and 14" dia.) between the existing Foxtrot A Platform and the new Marlin Platform.
- Two export pipelines (6" and 14" dia.) from the new Marlin Platform to the shore, together with the beach crossing and tie-in at onshore facilities.

Solution

Where existing pipelines would be crossed by the new facilities, protection mattresses were installed at the crossing points. These consist of a flexible rectangular mattress unit made of steel wire woven mesh, filled with a sand-asphalt mastic all encapsulated in a geotextile cover. The bituminous mattress remains flexible even at low temperatures and prevents damage between the pipelines where they cross.



Client:

FOXTROT INTERNATIONAL

Main contractor:

MICOPERI SRL

Designer:

SPS - FANO

Products used:

ACBM - SARMAC - MACBAGS

Date of construction

SPRING 2014

After the new pipelines had been installed, they were protected by mattresses placed at the base of riser tie-in spools and pipelines up to 60 meters from the platform base. In these locations, the protection mattresses used were Articulated Concrete Block Mattress (ACBMs) and offer a high degree of flexibility in both longitudinal and transverse direction.

The design of the mattresses took into account the following:

- Interaction forces exerted by the mattress on the pipelines
- Water depths
- Geo-morphological conditions
- Environmental conditions
- Long design-life; there should not be any significant deterioration, or loss of the original properties
- Mattresses will be suitable for the entire life of the pipeline (30 years).

Both concrete and bituminous mattress needed to provide functionality and structural integrity even in the case of accidental impacts. The expansion loop, the spool and the pipelines up to 60 meters from platform base had to be adequately protected against dropped objects with an impact energy of:

- 20kJ energy impact with 500mm diameter object
- 5kJ energy impact with 100mm diameter object

Maccaferri issued 3rd party Bureau Veritas certification on its ACBM and SARMAC units.

Maccaferri ACBM units are produced in a patented mobile formwork. This enables the manufacturing of the ACBMs as local as possible to the final destination, or to suit the convenience of the installing contractor. In this case, the casting yard was in the Micoperi yard in Ortona (Chieti) Italy, and from there were shipped to Ivory Coast.

Maccaferri supplied:

- 100 No. ACBM dimensions 6.32x2.26x0.20 m
- 14 No. SARMAC dimensions 6.00x2.35x0.20 m
- 2500 No. MacBags dimensions 0.70x0.40 m



ACBM manufacture



ACBM demoulding



ACBM in stock

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Maccaferri operates under strict quality assurance and management procedures. Please visit the website of your local subsidiary for details of their Certifications.