

DEKA DEVELOPMENT PROJECT
EGYPT

PIPELINE PROTECTION

Product: ACBM (Articulated Concrete Block Mattress) SARMAC® T Mattress

Problem

Egypt and Petrobel wanted to maximize the usage of local existing resources in order to increase the gas production to fulfill the growing domestic needs. Petrobel launched a project targeting the development of both the Denise and Karawan fields in the Tamsah Concession. This is located offshore of Egypt and is planned to add around 210 MMScfd (million standard cubic foot per day) of Natural Gas production. The estimated project cost was \$470 Million. The Denise and Karawan fields are located around 70km and 60km off the Egyptian coast respectively. The Denise field is in water depth of about 100m and Karawan at 68m depth.

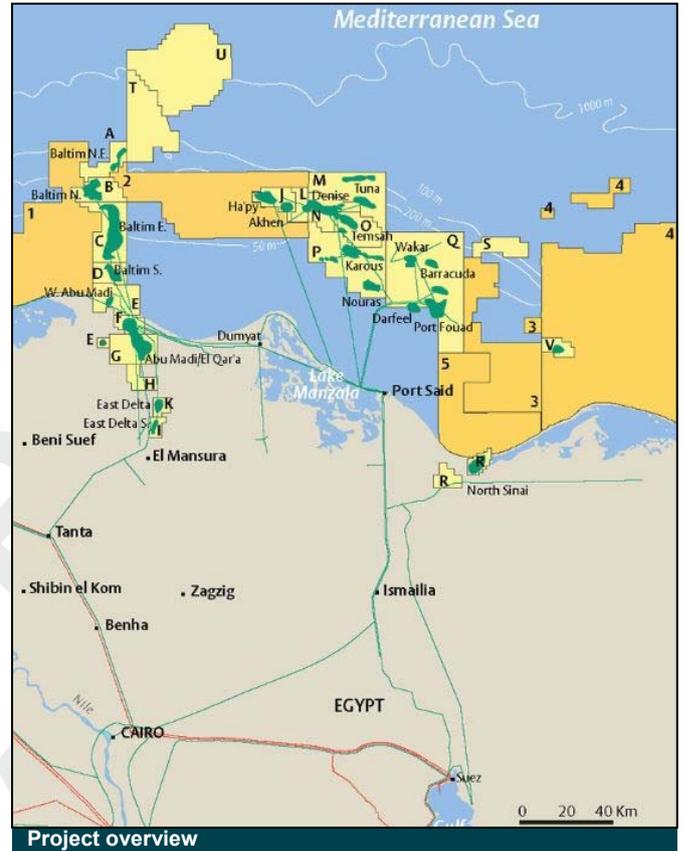
Project Facilities

The Denise field development mainly consists of the following:

- Exploitation of Denise North, Denise North West and Denise South fields by means of three subsea wells (DNW1, DS6 and DN)
- Installation of a 16"/3.5km subsea pipeline to convey DN well production from the new PLEM at the DN well area to the new PLEM at the DNW1 well area
- Subsea HIPPS at DS6, DNW1 and DN well locations are needed to protect the downstream sea lines from operational overpressure due to high static pressure of the new wells
- Installation of a 16"/4.4km subsea pipeline to convey DN and DNW1 wells production from the new PLEM at DNW1 well area to a new PLEM at the D4 well area
- Installation of a 10"/1km subsea pipeline to convey the DS6 well production from the new PLEM at the DS6 well area to the new PLEM at D4 well area
- From the D4 well area, production will be routed to the existing Denise B PLEM and exported onshore via the existing 32" Pliocene sealine.

Solution

Before the installation of the new pipelines the crossing points with existing pipelines were protected with SARMAC® mattresses. 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.



Project overview

Client:

PETROBEL

Main contractor:

MICOPERI SRL

Designer:

ENPPI EGYPT

Products used:

ACBM—SARMAC®

Date of construction

SPRING 2014



Material in stock at Micoperi

After the pipeline installation, protection mattresses were placed at the base of the riser tie-in spools and pipelines up to 60 meters from the platform base. These protection mattresses consisted of Articulated Concrete Block Mattresses (ACBM) offering a high degree of flexibility in both longitudinal and transverse direction.

The design of the ACBMs took into account the following requirements and conditions:

- 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 including in the case of accidental impacts. The expansion loop, the spool and the pipelines up to 60 meters from the platform base, had to be adequately protected against dropped objects with an impact energy equal to:

- 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 Egypt.

Maccaferri supplied:

- 70 ACBM units of dimensions 6.32x2.26x0.20m
- 67 SARMAC® T units of dimensions 6.00x2.35x0.20m



Material in stock in Micoperi



SARMAC® T production completed



SARMAC® T delivery

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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.