

GAS PIPELINE PROTECTION
WEST LIBYAN GAS PROJECT - LIBYA

GAS PIPELINE PROTECTION

Product: SARMAC[®] bituminous mattress & lifting frame

Problem

The Greenstream is part of the Western Libyan Gas Project, which is the first major project to exploit the natural gas produced in Libya through export and marketing in Europe. The Greenstream, developed by Saipem, connects the Mellitah Gas Processing Plant, on the Libyan coast, to Gela in Sicily.

The natural gas comes from two fields: the offshore field Bahr Essalam which is located 110 km off the Libyan coast, and the onshore field Wafa which is close to the border with Algeria. Eni is the operator with a 50 per cent stake for the joint development of the fields, while the other partner is the National Oil Corporation (NOC), which is the Libyan state-owned oil company.

Two underwater pipelines are transmitting the gas and condensate to the treatment plant at Mellitah. The condensate is pumped through a 10" pipeline to the onshore Mellitah complex for further treatment and export. The gas is transported through a 36" pipeline to the Mellitah plant for final treatment and onward transmission to the local market and export to Italy through Greenstream compression station and 335 miles of 32" subsea pipeline.

Both 10" and 36" pipelines required protection against hydraulic forces existing at the sea bed; in addition, at crossing areas a suitable separation layer was needed to maintain the minimum required separation between pipelines.

Solution

Maccaferri's SARMAC[®] bituminous mattress was used to provide ballast, anchorage and protection from falling objects to both sealines. SARMAC[™] bituminous mattresses were also the optima technical solution able to guarantee the required separation layer for crossing areas.

Officine Maccaferri supplied:

- 729 SARMAC[®] bituminous mattress, dimensions 5.00x2.35x0.30 m
- 1 manual lifting frame for handling operations.

Maccaferri decided to install its Sarmac[®] manufacturing yard in Malta, near to the final delivery point, for economical reasons. This solution saved on transport costs giving a better service to the Client.

Client:

ENI—NOC

Main contractor:

SAIPEM

Designer:

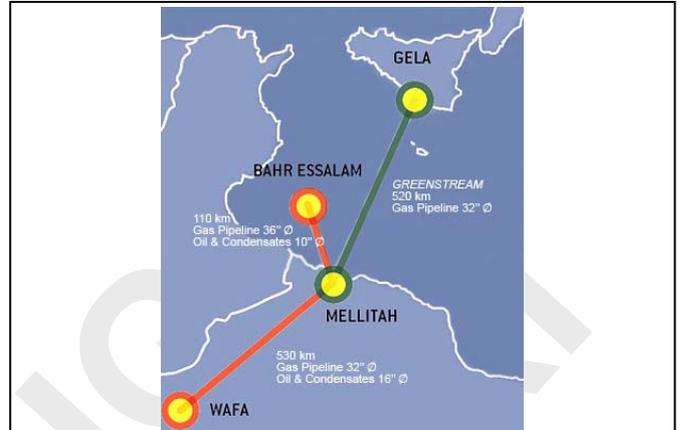
ENI—SAIPEM

Products used:

SARMAC[®] BITUMINOUS MATTRESS/LIFTING FRAME

Date of construction

2004



Project location



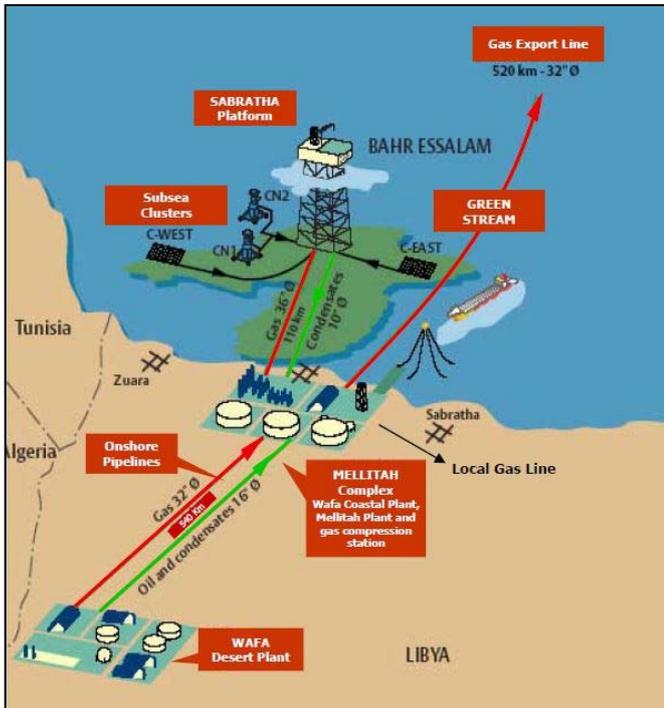
SARMAC[®]



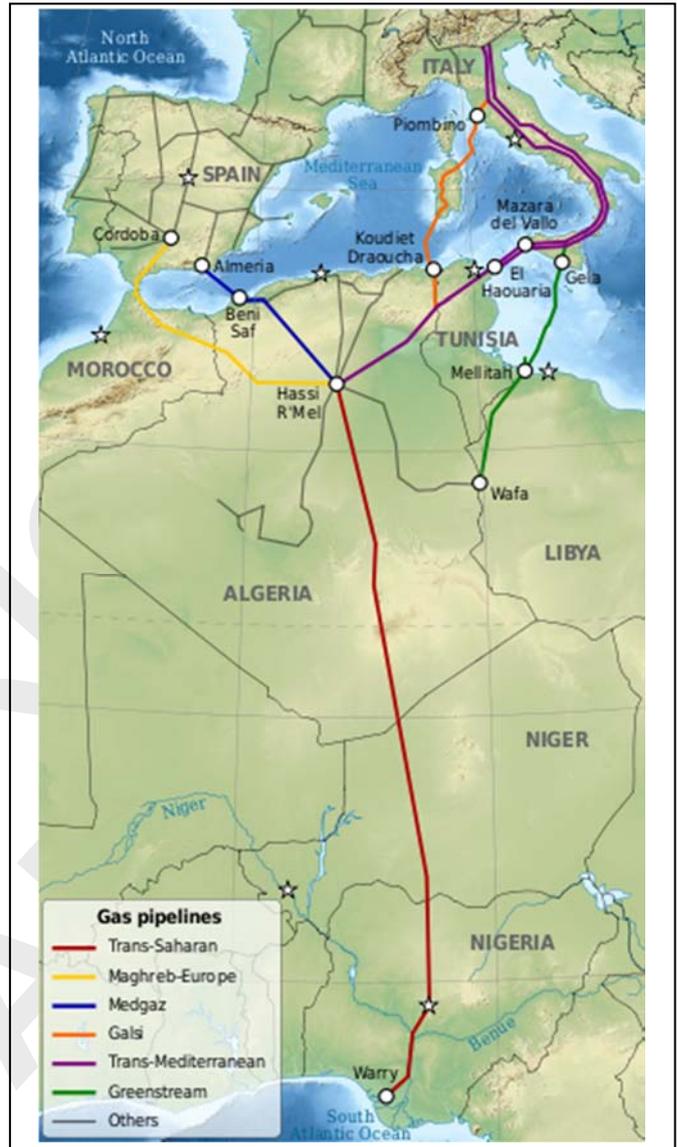
SARMAC[®] loading on the vessel

Details

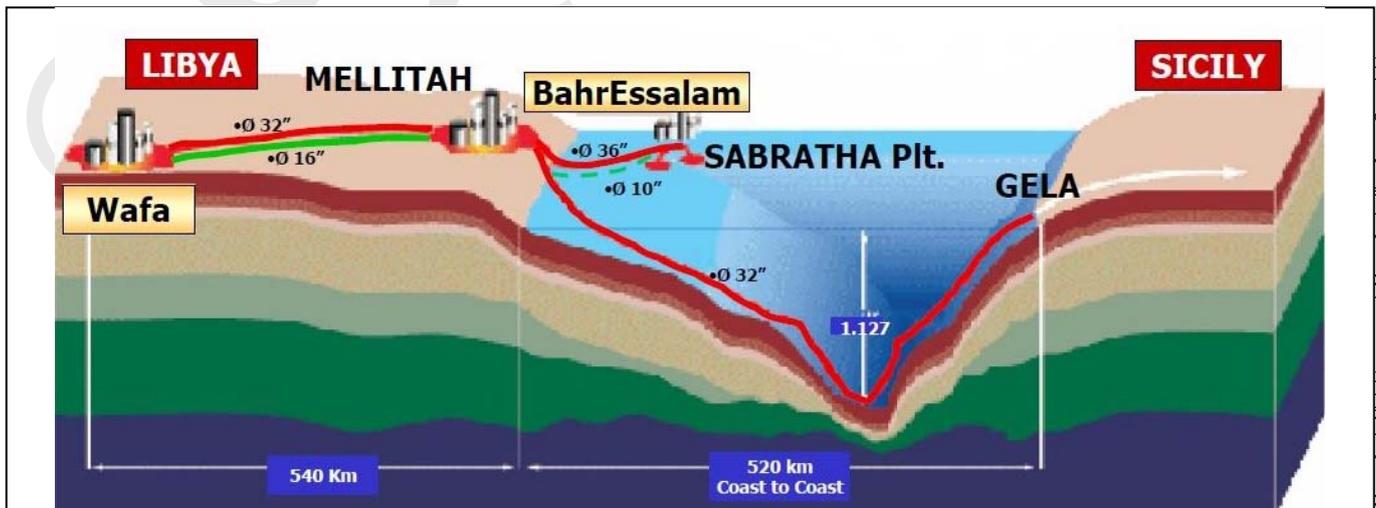
- Eni's share of recoverable reserves is 950 million BOE (Barrels of Oil Equivalent)
- Production level is 10 billion cubic meter of gas per year: 4.0 bscm/y at Wafa; 6.0 bscm/y at Bahr Essalam
- 8 bscm/y of produced gas is delivered to Italy while 2 bscm/y is supplied to local market.



Scheme of the project



Pipeline infrastructure



Schematic cross section of works

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