

**PIPELINE PROTECTION**  
 CO.GA. PROJECT — CONGO

**PIPELINE PROTECTION**

**Product: Articulated Concrete Block Mattresses (ACBM) & Lifting Frame**

**Problem**

The project included the precommissioning services on the Congo Gabon Flexible Replacement Project (FRP). The whole project is estimated to be worth over \$1.61 million.

The Co-Ga FRP follows a review by Total, which identified the need to replace flexible lines and piping in Gabon’s Anguille, Baudroie-Baliste, Torpille, Mandaros Barbier and Gonelle fields and in the Sendji, Yanga and Tchibouela fields in Congo.

Within this review:

- A number of static flexible lines would need to be replaced in Congo and Gabon (with associated piping for connection to jacket topsides)
- 2 new lines would have to be installed, from 2 production platforms to a 12” export pipeline via 2 hot-tap systems. (Gabon)
- 2 subsea PLEMS (Pipe Line End Manifold) would require modification (Gabon)
- Some old flexible lines and I-tubes would be removed

These activities represented the main scope of the "Congo Gabon Flexible Replacement Project". Technip France was awarded three contracts for the Project activities described above: one for the supply of flexible lines in Gabon, one for the supply of flexible lines in Congo, and one "Gabon Installation Contract" covering all EPIC activities in Gabon except for the supply of flexible lines.

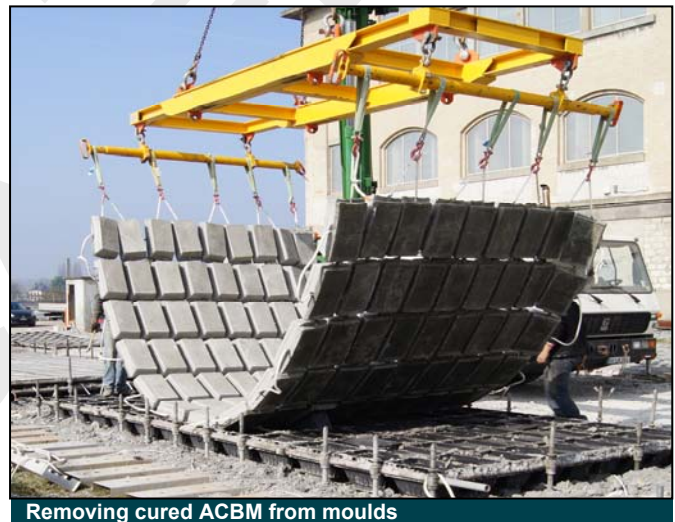
**Solution**

The project included different situations which required the installation of pipeline protection systems.

The presence of new platforms and new pipelines required the use of ACBMs both for pipeline protection close to the platform, and for pipeline crossings over existing undersea infrastructure.



Concrete mattresses curing process accelerated by steam



Removing cured ACBM from moulds



ACBM handling and stock operations

Client:

TOTAL

Main contractor:

TECHNIP FRANCE

Designer:

TECHNIP FRANCE

Products used:

ACBM MATTRESSES/LIFTING FRAMES

Date of construction

FEBRUARY 2012

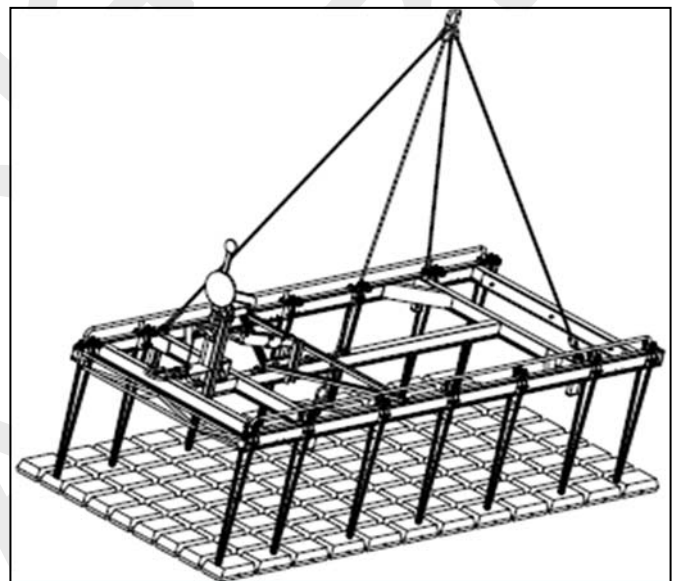
## Maccaferri supplied:

1. 108N: ACBM dimensions 6x3x0.15 m
2. 2N: ROV friendly automatic frames, suitable for installation in deep water of ACBM mattresses

The client elected to locate its premises in Le Trait close to Rouen, France. Accordingly, Maccaferri located its mattress fabrication jobsite in Yainville approximately 5km from the final delivery point for efficiency and economics. This solution also reduced the transport costs and providing a better service to the client including making direct supervision on the jobsite.



ACBM mattresses in stock (March 2013)



Schematic of an ACBM automatic ROV friendly frame



Loading test on an ROV automatic frame suitable for deep water ACBM launching operations

### Officine Maccaferri S.p.A. Global Headquarters

Via JF Kennedy 10, 40069 Zola Predosa (BO) - Italy

T: (+39) 051 6436000 F: (+39) 051 643 6201

E: [info@hq.maccaferri.com](mailto:info@hq.maccaferri.com)

[www.maccaferri.com](http://www.maccaferri.com)

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