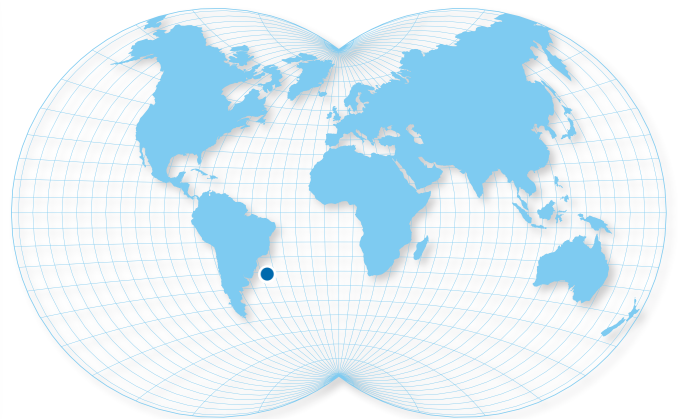


# MARLIM SUL, RONCADOR AND MARLIM LESTE FIELDS, BRAZIL:

## FSO Cidade de Macaé MV15

### External Turret



### Scope of Work

SOFEC designed, constructed and supplied an external turret mooring system to moor a 350,000 dwt MODEC-converted FSO vessel to receive, store and offload oil produced by the PRA-1 Platform and nearby oil fields in the Campos Basin, Brazil.

### General Description

Client Name:	Petroleo Brasileiro S.A.(Petrobras)
Contract Award:	December 2005
Installation Date:	April 2007
First Oil:	November 2007
Vessel Size:	350,000 dwt (approx.)
Storage Capacity:	2,200,000 bbls
Water Depth:	95m (311ft)
Supply / Fabrication:	Turret - Malaysia Vessel - Singapore

### Design Environmental Criteria (100-year storm)

Significant Wave Height:	7.8m (26ft)
Wind Velocity:	29m/s (56.4 knots)
Surface Current:	2m/s (3.9 knots)

### Mooring System

- 12-leg 3 x 4 chain catenary mooring system
- 4.75-in. R3 chains and drag anchors

### Turret

The SOFEC® external turret mooring system provides a safe and reliable means of mooring the FSO on station in the PRA-1 field for the entire 20-year service life of the FSO, in all sea conditions including the 100-year storm. The riser system must remain undamaged in the 100-year storm. The SOFEC® external turret mooring system will load and offload crude simultaneously.

### Fluid Swivel Assembly

Production:	5 x 16-in. nominal toroid fluid swivel (Class 900)
Gas Import/Export:	1 x 4-in. nominal toroid inline swivel (Class 1500)
Utility:	Drains, air, etc.



# FSO Cidade de Macaë MV15

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**(Continued)**

## **Fluid Swivel Assembly**

Electrical Swivel:	4 circuit 13.8 kV x 30 MW power slip ring with signal and controls
Optical Swivel:	Fiber optic slip ring included

## **Riser System**

- 7 x 12-in. cargo oil risers
- 1 x 4-in. import fuel gas riser
- 4 x power umbilicals

## **Comments**

This unique SOFEC external turret mooring system is ABS classed.