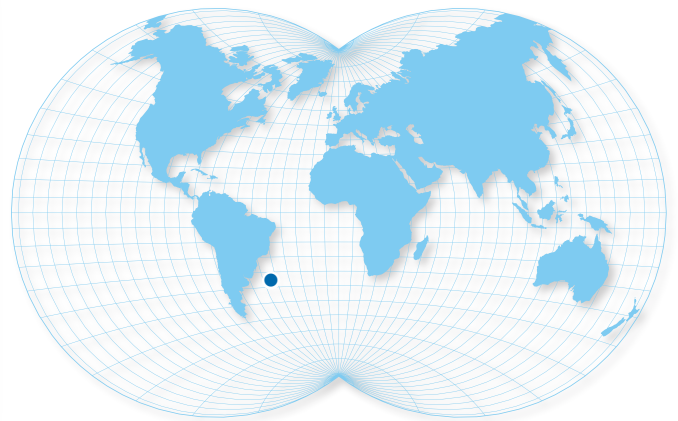


## GUARA FIELD, BRAZIL:

# FPSO Cidade de São Paulo MV23 Spread Mooring



### Scope of Work

SOFEC designed and procured a spread mooring system for the FPSO Cidade de São Paulo – MV23 which is deployed in the Guarã field in Santos Basin.

The FPSO is capable of processing 120,000 barrels of oil per day or 150,000 barrels of total fluids per day, 180 MMscf/d of gas, with a CO<sub>2</sub> content up to 30% and have a storage capacity of 1,600,000 barrels. The FPSO is able to inject 150,000 barrels of water per day. The FPSO will initially gather production from 15 subsea wells, 5 of those will be converted into gas and water injection wells over the course of the projects.

The FPSO is able to accommodate a total of 48 flexible risers and umbilicals. The FPSO is also able to accommodate 15 steel risers instead of the 15 flexible pipes serving the production wells.

The SOFEC spread mooring system is ABS classed.

### General Description

Client Name:	Petroleo Brasileiro S.A. (Petrobras)
Contract Award:	June 2010
Installation Date:	January 2012
First Oil:	May 2013
Vessel Size:	340,000 dwt

Storage Capacity:	1,600,000 bbls
Water Depth:	2,140m (7,037ft)

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

Sig. Wave Height:	11.11m (36.5ft)
Wind Velocity:	34m/s (66 kts)
Current:	1.72m/s (3.34 kts)

### Mooring System

24-leg synthetic polyester/chain system arranged in four (4) sets of six (6) anchor legs  
Torpedo piles supplied by owner

### Riser System

- 1 x Fiber Optics Cable
- 16 x Function Electrical-Hydraulic Umbilical
- 15 x Service Flexible
- 15 x Oil Production Flexible
- 1 x Gas Export Flexible
- 5 x Gas Injection Flexible
- 5 x Water Injection Flexible
- 5 x Gas Injection Steel Riser
- 10 x Oil Production Steel Riser