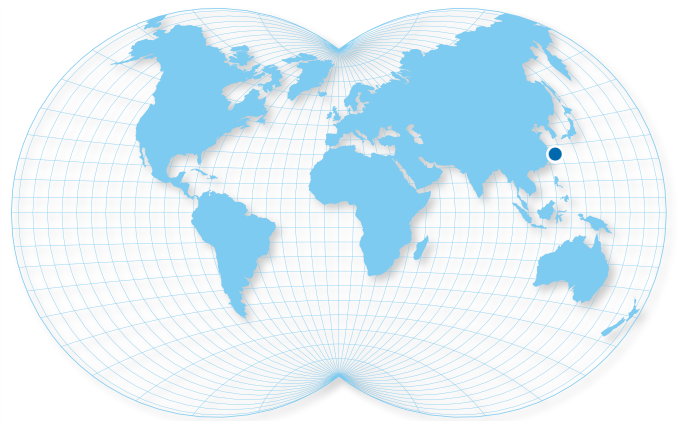


QINHUANGDAO (QHD32-6) FIELD, CHINA: FPSO BOHAI SHI JI Tower Yoke



Scope of Work

SOFEC designed and provided project management for a tower yoke mooring system for a new 172,000 dwt purpose-built double-hull vessel. CNOOC's nominated fabrication and installation contractor was China Offshore Oil Engineering Corporation (COOEC).

General Description

Client Name:	China National Offshore Oil Corporation (CNOOC)
Contract Award:	December 1999
Installation Date:	August 2001
First Oil:	October 2001
Vessel Size:	172,000 dwt
Storage Capacity:	1,000,000 bbls
Water Depth:	20m (66ft)
Fabrication:	Tower Jacket - China Topsides - China Mooring Yoke and Vessel Support Structure - China Vessel - China Vessel Topsides - China

Design Environmental Criteria [100-year storm]

Significant Wave Height:	5.1m [16.7ft.]
Wind Velocity:	26m/s [50.6 knots]
Current:	2.1m/s [4 knots]
Earthquake	
Ice	

Mooring System

Tower Yoke:	
4-pile jacket	
Liquid ballast in yoke	

Fluid Swivel Assembly

Production:	2 x 18-in. toroid [740 psi design]
Production / Water Injection:	1 x 18-in. toroid [740 psi design]
Water Injection:	1 x 18-in. toroid [740 psi design]

FSO BOHAI SHI JI

(Continued)

Electrical Slipping Assemblies

Medium Voltage:	3 x 3 phase 10.5 kV @ 510 amps
Utility / Control:	80 Electrical paths (power and signal)

Riser System

- [6] Jacket mounted J-Tubes for subsea pipelines
- [3] Jacket mounted J-Tubes for submarine cables

Comments

The SOFEC tower yoke mooring system is located in the QHD32-6 field development in Bohai Bay China, in a water depth of 20m. The FPSO generates and provides medium voltage electrical power to six fixed unmanned satellite platforms. The medium voltage power transmission to the platforms is achieved through a medium voltage slipping assembly mounted on the rotating tower topsides module. The medium voltage power is used to drive 128 submersible pumps installed in the QHD32-6 reservoir. The FPSO is designed to produce a total of 270,000 BPD of combined fluids including 80,000 BPD of crude oil. Processed crude is exported through a tandem offloading arrangement.

The SOFEC tower yoke mooring system is DnV classed.