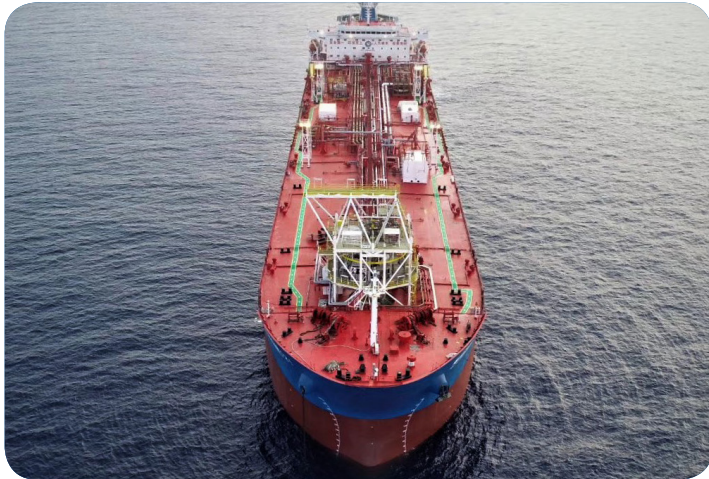


LUFENG 13-2 FIELD - PEOPLE'S REPUBLIC OF CHINA:

FSOU Hai Yang Shi You 121 Disconnectable Internal Turret



Scope of Work

SOFEC was awarded the Lufeng Permanent Reinstatement Project Provision of Turret System by CNOOC China Limited. The system is a Disconnectable Turret System was integrated into a replacement FSOU and moored to the existing Lufeng 13-2 Field Moorings in the South China Sea.

The award was for the engineering, procurement and construction (EPC) of an Internal Disconnectable Turret System for the CNOOC Lufeng 13-2 Field Floating Storage and Offloading Unit (FSOU) Project. The FSOU is a converted 110,000 DWT Crude Oil Tanker with an overall length of 245 meters.

The SOFEC disconnectable internal turret mooring system for this field was originally designed and installed in 1993. It moored a MODEC-converted 121,361 dwt FSOU vessel in the typhoon alley area offshore People's Republic of China.

The internal disconnectable turret mooring system was chosen to allow the FSOU to disconnect and sail to safe harbor as typhoons approach. The FSOU could then return to the field and reconnect

after the typhoon has passed. Under normal operating conditions, the turret allows the FSOU facility to continually rotate into prevailing weather without production interruptions.

In 2012, CNOOC replaced and relocated the mooring legs and submerged buoy of the original system as part of the field's life extension. This new vessel and turret shall be designed to connect to the existing buoy and moorings, and provide a fluid flow path for the riser.

SOFEC was responsible for all EPC activities related to the Internal Turret Mooring System and its ancillary components. SOFEC will also assist in turret integration and offshore commissioning activities in China.

General Description

Client Name:	CNOOC China Limited
Contract Award:	August 2018
Installation Date:	Planned for 2020
First Oil:	Planned for 2020
Vessel Size:	110,000 dwt

FSOU Hai Yang Shi You 121

(Continued)

Vessel AOL:	245m
Water Depth:	132m (433ft)
Fabrication:	Turret - China Vessel Conversion - China

Design Environmental Criteria (100-year storm)

Connected 100-year Non-typhoon

Significant Wave Height:	8m (26ft)
Wind Velocity:	25m/s (48.6 knots)
Current:	1.2m/s (2.33 knots)

Disconnected 100-year Typhoon

Significant Wave Height:	7.4m (24ft)
Current:	1m/s (1.94 knots)

Mooring System (Existing)

- 8-leg wire chain symmetrical catenary:
- 3.75-in., 4-in., and 5-in. ORQ chain with excursion limiter
- 3.5-in. sheathed spiral strand

Fluid Swivel Assembly

Crude Oil:	1 x 8in piggable in-line (1,480 psi operating/ 2,225 psi test)
Electrical Swivel:	440 volts at 550 amps (power) 220 volts at 30 amps (power) 30 volts at 3 ampere (data circuits)

Riser System (Existing)

- 1 x 8-in. Flexible Riser