

# Panyu, China

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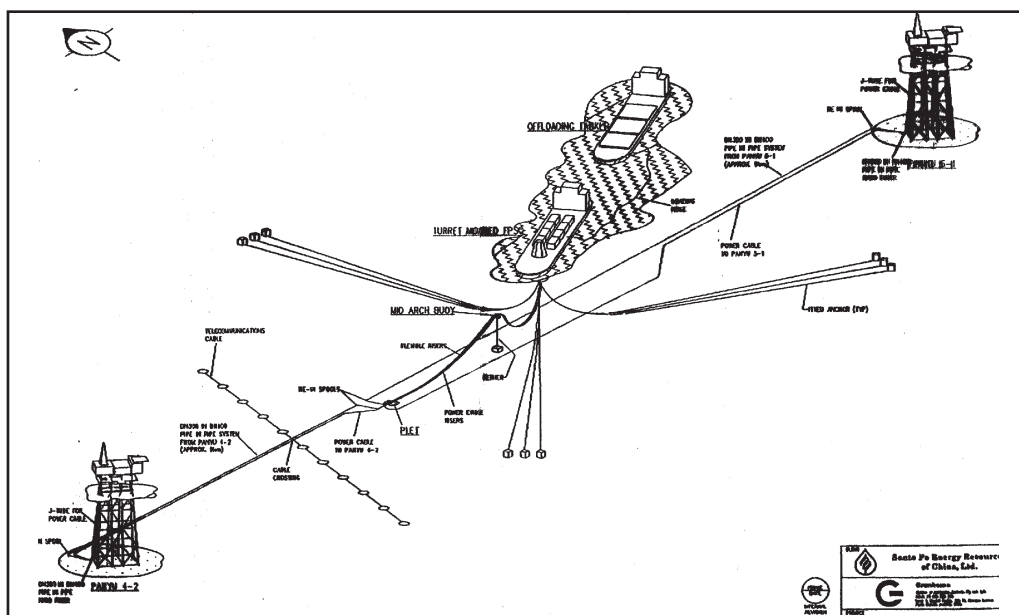
In 2002, NKT Flexibles was awarded an order for flexible pipes for the Panyu project by APL who had been awarded the turret system contract by China Offshore Oil Nanhai West (CONHW), a subsidiary of China National Offshore Oil Corporation (CNOOC). Scope of supply:

Field	Type	Application	Length (m)	Design Pressure (psi)	Design Temperature
Panyu	12"ID Dynamic Riser	Production	2 @ 350	1324	75°C

This order marks NKT Flexibles' entry into the Chinese market and encompasses the complex design, engineering, manufacturing, testing, documentation and delivery of two dynamic risers.

The Panyu oil field was discovered in 1998 and is located in the South China Sea approx. 200km south of Hong Kong in the Pearl River Basin. Panyu 4-2 is located approx. 18km west of Panyu 5-1. Water depths in the area range from 97m at Panyu 4-2 to 110m at Panyu 5-1.

The field development is based on two permanently manned fixed platforms 18km apart with a manned FPSO vessel located in between and interconnecting flowline and riser systems. Export to the FPSO from each platform is provided via an insulated pipe-in-pipe flowline (PIP) and flexible risers in Lazy-S configuration with a mid-depth buoyancy module between the Pipeline End Manifold (PEM) and the FPSO. Oil/water separation and oil stabilization will be carried out on the FPSO and stabilized crude will be exported via a floating 16"ID loading hose to a tandem moored tanker astern.



The Panyu 4-1 and 5-2 field layout

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The Chinese sea is known for its typhoons which is the reason why the FPSO vessel is designed to withstand the 100-year typhoon conditions, ie. a wave height of 13.1m and wind speeds up to 200km/h. The FPSO will not be disconnected during typhoon seasons.

Shortly after hook-up of the FPSO to the STP system, the Panyu field was hit by typhoon Dujan with wind speeds exceeding 160km/h. The FPSO and the riser system survived the environmental challenges without any damage.

The basis for the Panyu production riser is a rough bore steel carcass and an inner liner of PA 11. The lining is armoured with two layers of C-profile (pressure armour) and two layers of cross wound steel strips (tensile armour). Finally, an outer sheath of PA 11 is applied to seal the pipe against water ingress. The end-fittings are equipped with compact SPO type flanges.

The two fields will have a combined peak production capacity of 60,000 barrels of oil per day and it is expected to reach peak production by the third quarter 2004.



*The riser being prepared for installation on board the installation vessel*



*NKT Flexibles I/S is an independent company owned 51% by NKT Holding and 49% by Stolt Offshore. The company is responsible for the manufacture and supply of flexible pipe systems for the offshore oil & gas industry, as well as the chemical and water industry.*

**NKT**  
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Revision INOV. 2004/LEH