

TURRET & MOORING SYSTEMS



2008	2008	2009	2010	2012	2014	2014	2015	2015
								
P 53 FPSO: world record 75 Risers	Skarv FPSO: 5,000 t mooring load	MoorSpar concept : disconnectable for steel risers	BC-10: first turret with Steel Risers	Okha FPSO: re-use of Cossack Pioneer RTM	Quad 204 FPSO: most complex turret	Ichthys FLNG: First use of ARCA technology	Prelude FLNG: 10,000 t mooring load	Turritella: First disconnectable with steel risers

TOP-END mooring solutions

- Large, **highly complex**, bespoke turrets and mooring systems offering maximized reliability and production uptime from the market pioneer
- Custom-designed for Clients requiring the market best - often operating in **harsh environments**, and presenting challenging technical requirements
- SBM Offshore helps clients make challenging projects reality and consistently achieves **world firsts** – from Quad 204 TMS, to Prelude TMS, and the *Turritella* disconnectable turret
- Customized design using standard components and design philosophies to offer the highest level of functionalities, **large number of risers (25 to 100)**, demanding subsea requirements, complex weathervaning systems and high reliability



The QUAD 204 Turret:
breaking engineering records for the most complex Manifold ever built, in the most challenging environment







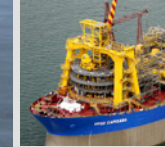




FOCUS ON: Bogie Turret Technology for high reliability

SBM Offshore's **patented turret technology** employs standard heavy-duty components - Axial Bogies and Radial Wheels. Designed for harsh environments and high numbers of risers, the technology is limitless and has achieved numerous world firsts for extreme mooring loads, riser numbers, complexity of manifolds and use of steel risers. **Redundancy in design** is a further key feature which allows not only in-service inspections and maintenance but also change-out of components.



MID-COMPLEXITY MOORINGS

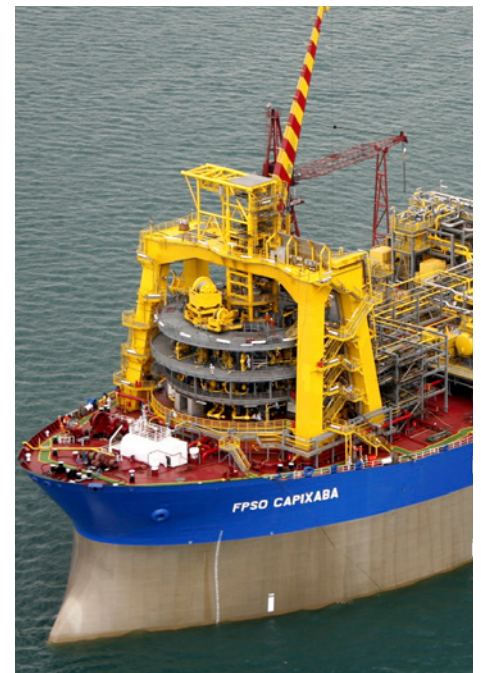
1996	1996	1997	2000	2000	2003-14	2006-13	2007	2013-16
								
4 BMIT	Schiehallion first turret with Bogies	6 Clamped turrets	7 'flexible' turrets	Tower Soft Yoke with 5 jumpers	5 Generic External Turrets	3 Generic Internal Turrets	External turret with GAP	4 Santos Basin spread mooring

MID-COMPLEXITY mooring solutions

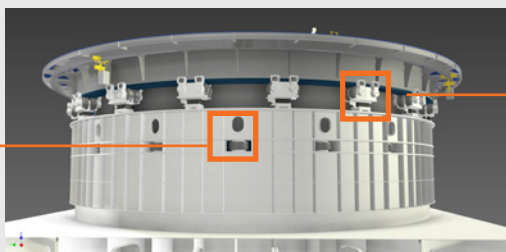
- **"Less is more"** philosophy - challenging the need for complexity and maximizing the use of **standard** components
- Mid-complexity turrets from the market leader, offering streamlined, tried and tested designs for **reliable offshore performance**
- **Optimized** approach to define pertinent levels of functionality and redundancy, and providing safe, reliable and cost-effective products
- Selecting TMS functionalities within the bigger picture of **field economics**



Xikomba - External turret



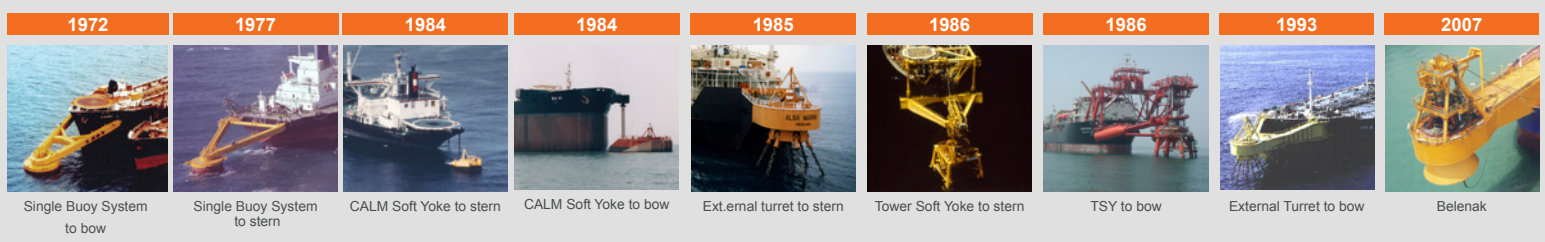
Capixaba - Internal Turret with bogies



FOCUS ON: Field Economics

In current market conditions it is more important than ever to **find the 'sweet spot'** balancing TMS complexity/cost and uptime/production

BACK TO BASICS



BASIC mooring solutions

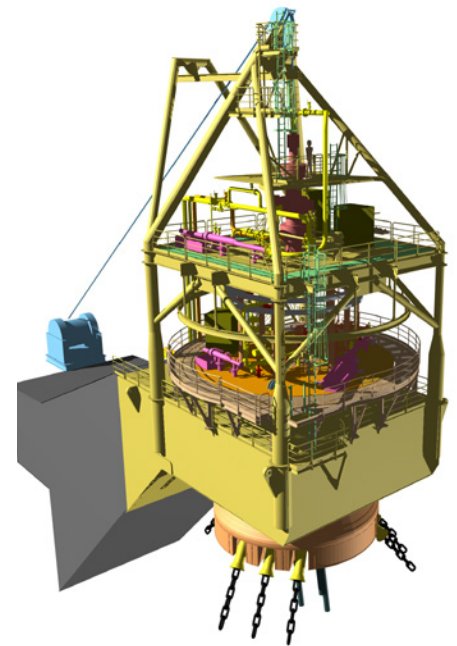
- **Low-complexity** turret and mooring systems from the market leader
- Taking the best of SBM's turret catalogue and track record to offer **simple, safe** systems
- Delivering **fit-for-purpose** mooring systems with a basic level of functionalities
- Minimizing impact on the vessel, with practical and **cost-effective** solutions
- Optimizing the **NPV** equation in the low oil price era
- Suitable for **cost-conscious** clients with **simple field requirements** - few risers and relatively low mooring loads



Nan Hai Fa Xian



FSO Rang Dang I



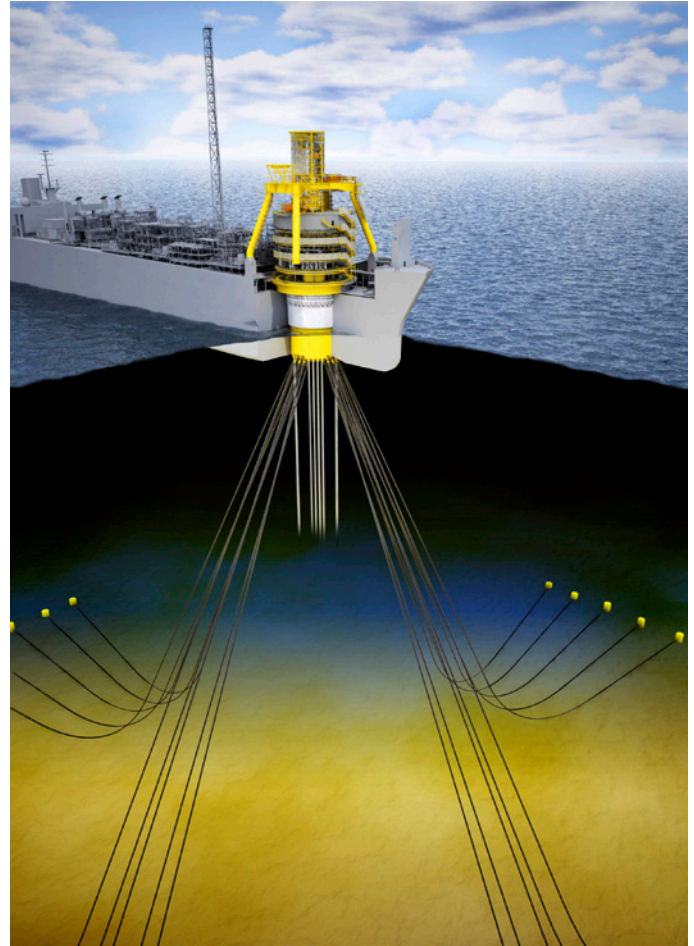
FOCUS ON: Keeping it simple and safe

Only a seasoned mooring system expert like SBM Offshore can truly offer **safe, simple, cost-effective mooring solutions**, whilst still meeting design and safety requirements.

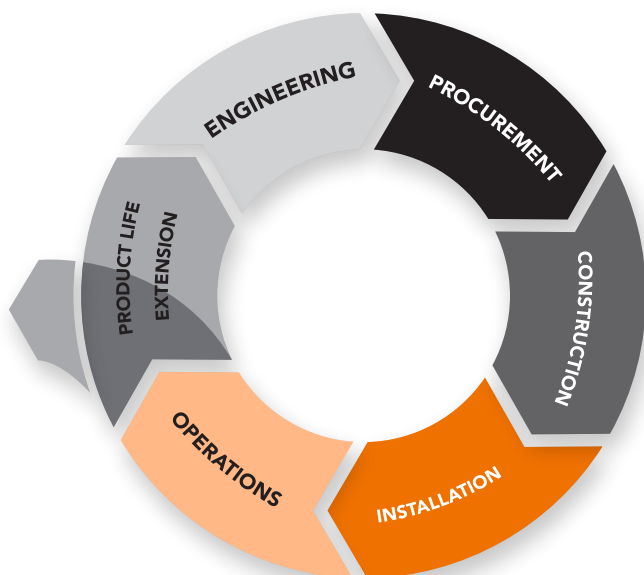
Since developing the first mooring systems almost 60 years ago, SBM has maintained the position of market and technology leader in offshore mooring systems. **This expertise goes into all our products.**

SBM Offshore is the recognized market and technology leader of Turret and Mooring Systems (TMS) having supplied over 100 mooring systems, to numerous clients, in many locations, over almost 60 years.

- **Extensive TMS catalogue of solutions:** the industry's greatest range and variety of mooring solutions, from Top End, to Mid-Complexity and Simple mooring systems.
- **Technology Innovator:** delivering project specific technology along the full TMS lifecycle.
- **Installation Expertise:** SBM Offshore operates two installation vessels delivering seamless solutions for all types of offshore mooring works and subsea construction activities.
- **Offshore Expertise:** ensuring safe, efficient offshore operations thanks to the operational expertise of SBM's Fleet.
- **Focus on field economics:** NPV focus - balancing risk and finance – to ensure clients make the most of their assets.
- **Advice and Expertise:** leading the industry with adapted, tailored solutions to match clients' budget and field requirements.



THE FULL TMS PACKAGE



From the seabed to the vessel:

SBM Offshore is unique as the only Turret and Mooring System provider to deliver a full EPCI product lifecycle

The Full TMS Package: From mooring analysis and design, to engineering, procurement and construction of the turret, swivels, weathervaning system, integration, riser technology, mooring lines and anchors, installation, inspection and maintenance, and change-out programs.

SBM's unique set of skills provides industry leading expertise in: mooring analysis, mooring components, turret systems, offshore Installation operations, FPSO operations, and **recognized expertise** in riser system definition and steel riser detailed design.



The sole intention of this factsheet is to share
general information.

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