Challenges and Opportunities for Conversion LNG FPSO

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Industry Leading Floating System Provider

**The Company**
- 5 Regional Centers
- 13 Shore Bases / Operations Offices
- 4 Site Offices
- ~9,000 Employees

**Lease Fleet**
- 11 FPSOs; 2 under construction
- 2 FSOs
- 1 Semi-sub
- 1 MOPU

**Financials in US$ billion, 2015**
- 2015 Directional(1) Guidance 2.6
- Directional(1) Backlog 18.9
- Market Cap 2.6

**Performance 2015**
- 264 years of operational experience
- 99% Uptime
- 1.21 MM bbls throughput capacity/day
- 7,477 Tanker Offloads

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(1) Directional view is a non-IFRS disclosure, which assumes all lease contracts are classified as operating leases and all vessel joint ventures are proportionally consolidated.
Our Business

TECHNOLOGY
FPSO / FSO
Brownfield Services

PROJECT EXECUTION
FLNG
3rd Party O&M

OPERATIONS
Semi / TLP
Offshore Installation

FINANCE & LEASE
Turret Mooring Systems
Terminals (Imodco)
Our sources of Resilience to the current storm

- **Backlog**
  - Contractually secured, near record US$19.0 billion
  - Not price or production volume sensitive

- **Capacity Adaptations**
  - Released 1,500 positions to optimise cost base
  - As the market further develops, SBM Offshore will adapt accordingly

- **Transformation Initiatives**
  - Odyssey24, fleet maintenance, R&D activities, and reorganisation
  - Increase operational efficiency, reduce costs

- **Economical Production**
  - US$6.90 average Lease & Operate unit cost/bbl
  - Production economical far below current oil price
  - FPSO oil production uptime more than 99%
Life Cycle Business Model

Full lifecycle enabling continuous improvement based on feedback from Projects and Operations

**Brownfield Services**
Life Extension, Upgrades, Modifications, Relocation and Decommissioning

**Operations**
260+ years of experience
99%+ production uptime
Largest international FPSO fleet

**Installation**
Dedicated fleet
Unparalleled experience
Extensive project capability

**Engineering**
50 years of industry firsts
Leading edge technology

**Procurement**
Integrated supply chain
Global efficiencies
Local sourcing

**Construction**
Strategic partnerships Unrivalled project experience
LNG FPSO Track Record

- Generic - Niche
- Petrobras - DMR
- Twin-Hull - Dual N₂
- New Build - Dual N₂
- Generic - SMR
- Cash Maple - SMR
- Prelude Turret
- Browse Turret

Year:
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
Conversion and New Build solutions – Mid Scale LNG FPSO

Challenges

• Why put new equipment on an old lady?
• Is the unit as safe as a new built?
• Can it be designed for 20+ years life?
• Are conversion candidates available?
• It is much more complex than an FPSO
• Is it large enough for storage and deck space requirements?
• Can it operate in harsh environmental conditions?
Hull conversion and Moorings - similarity to Oil FPSO

**Hull System**
- Robust tanker design
- Maintenance and repair history
- Trading history
- Accurate forecast of future corrosion and fatigue damage
  - Corrosion rates
  - FEA Modelling
- Suitable for full design life without dry docking or offshore steel renewals

**Turret Mooring System**
- Accurate and comprehensive metocean data for site
- Calibrated and robust hydrodynamic models
- Reliability, Operability and Maintainability
- Simple hull integration
- Safe and fast offshore installation
- Minimum need for divers

Methods are Equally applicable to a LNG FPSO
FPSO topsides design and integration – Similarity to Oil FPSO

- Safe and robust design using full QRA approach
- Ability to handle full operating envelope of well fluids
- Marine and Topsides integration
- Full Life Cycle Cost approach to design and machinery selection
- Optimised balance between;
  - Efficiency and Simplicity
  - Performance and Uptime
  - Complexity and Robustness

Methods are Equally applicable to a LNG FPSO
3rd Generation FPSOs - CDS and CDM

- Generation 3 FPSO
- Topside: 23,000 T
- Conversion in China completed
- Topsides module fabrication in BRASA
- 20 year lease

First Oil 2016
Opportunities for Conversion – Mid Scale LNG FPSO

• Lower cost: acquisition + refurbishment + hull conversion
• Faster schedule; experienced contractor required
• Flexibility in local content options
• Flexibility in contracting strategy

Conversion complexity and topsides weight is same order to 3rd generation FPSO conversion
Conclusions

• Conversion and new build can be competitive solutions in the mid-scale LNG FPSO segment

• Harsh environmental conditions, large storage capacity or deck space requirements will favor new-builds

• Lower CAPEX, execution flexibility (local content) and schedule advantages will favor conversion solutions

• SBM Offshore flexible to engage with both models
Thank You..!

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