MCE Deepwater Development 2016

Challenges and Opportunities for Conversion LNG FPSO

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Industry Leading Floating System Provider





(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

PROJECT EXECUTION



FPSO / FSO



FLNG



OPERATIONS

Semi / TLP

FINANCE & LEASE



Turret Mooring Systems



Brownfield Services



3rd Party O&M



Offshore Installation



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





LNG FPSO Track Record







Conversion and New Build solutions – Mid Scale LNG FPSO



or



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

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- Robust tanker design
- Maintenance and repair history
- Trading history
 - Accurate forecast of future corrosion and fatigue damage
 - o Corrosion rates
 - o 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;
 - o 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

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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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