

Technology Innovation Strategy of DeepStar® in the Gulf of Mexico

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Agenda

- Brief History of DeepStar
- Collaborative Space & Deepwater R&D Needs
- DeepStar 2017 Program Framework
- DeepStar Program Project Categories
- DeepStar Focus Areas
- DeepStar 2017 Core (C) and Satellite (S) Projects
- DeepStar Management and Committees
- DeepStar One Pager



Brief History of DeepStar

Since 1991, DeepStar® is an operator funded technology development collaboration program between oil companies, vendors, regulators and academic/research institutions.

DeepStar® Recent Technology Themes:

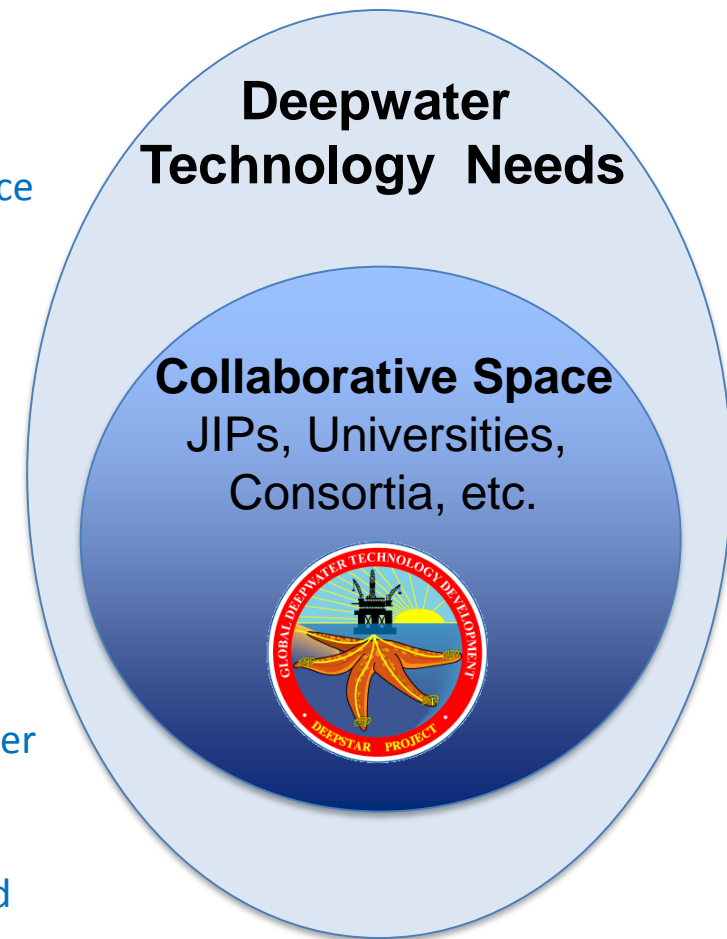
- Reservoir - Enhance Oil Recovery
- 20 ksi (HPHT) systems
- Long Distance Tie Backs
- Floating Systems Technology
 - Continued Service
 - Technologies for Harsh Marine Conditions
 - SLWR
- Technology Qualification

Phase XII Participants



Collaborative Space & Deepwater R&D Needs

- Competition vs Collaboration
- Why Collaborate
 - Financial Leverage
 - Certain projects can benefit from collaboration
 - DeepStar is a recognized industry collaborative voice
- Types of Needs
 - Facilities Focused
 - Inspection Techniques
 - Reliability, Continuous Production, Safety
 - MetOcean Conditions
 - Development Options
 - Drilling Operations
 - Standardization
- Via DeepStar® there is an opportunity for members to further
 - benefit by participating in an industry technical forum to develop solutions &
 - develop larger focused Satellites projects (JIP's) managed through DeepStar



DeepStar 2017 Program Framework

DeepStar 2017

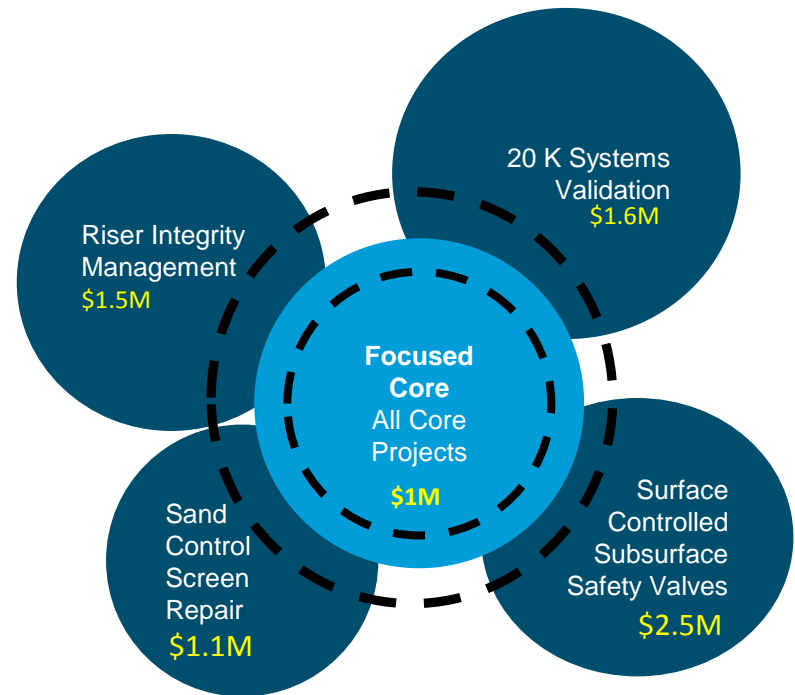
- Administered by OOC for cost efficiency and transparency
- Operators led consortium with only Operators on the Management Board
- DeepStar Director position is appointed by Management Committee and is an elected rotational position amongst Members

Focused CORE R&D

- Accelerated program allowing for quick solution to industry wide topics
- Smaller, more deliberate, creative CORE that initiates important, need-driven, deployable solutions
- Incubator for the elective Satellite

Elective Satellite

- A strategic value of the new consortium is DeepStar ability to develop and execute **SATELLITE Projects**.
- Utilizing our existing framework DeepStar will execute satellite projects that have been requested by CORE Members and opened to industry to participate.



DeepStar Program Project Categories

DeepStar New Model (CORE + Satellite Projects)



- **CORE Projects focus on:**

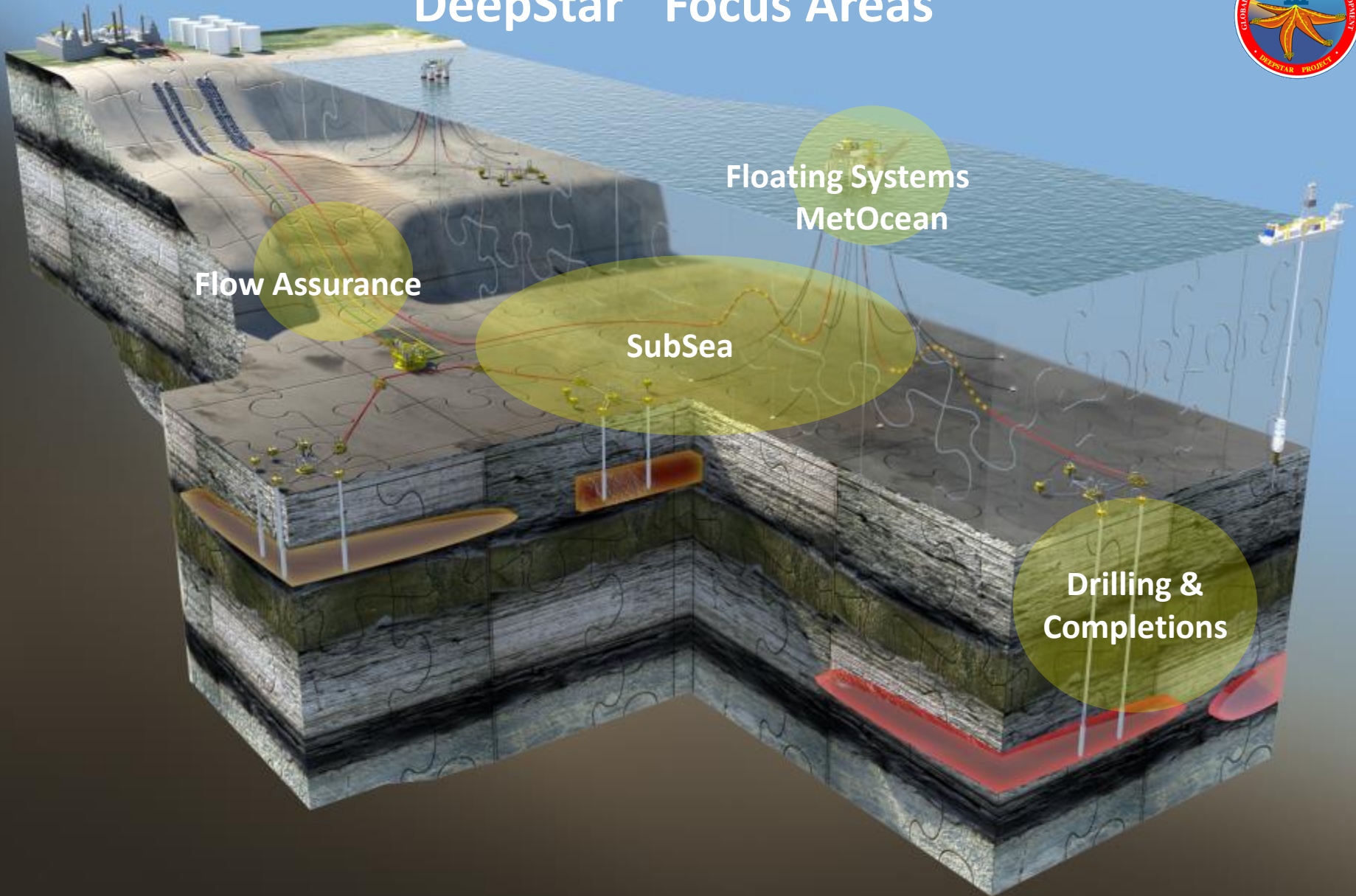
- collaborative project development and immediate industry needs
- Technical Discussion Forum, Industry Position Papers, Workshop Courses, State of Industry Projects

- **Satellite Projects:**

- Satellite projects size and cost designated by participants
- DeepStar will work with Core operators to identify opportunities for collaboration and co-funding of research efforts
- Interested parties equally contribute (Operators / Vendors)



DeepStar[®] Focus Areas



DeepStar 2017 Core (C) and Satellite (S) Projects

Drilling, Completion & Intervention - Subcommittee

- Shear Ram Systems (C)
- Through Tubing Repairs of SCSSV surface controlled subsurface safety valves (S)
- Through Tubing Sand Control Screens (S)

Flow Assurance – Subcommittee

- Hydrate Blockage Remediation – Electric Squid (C)
- Measurements of Gas Hydrates Phase Equilibria (C)

Floating Systems – Subcommittee

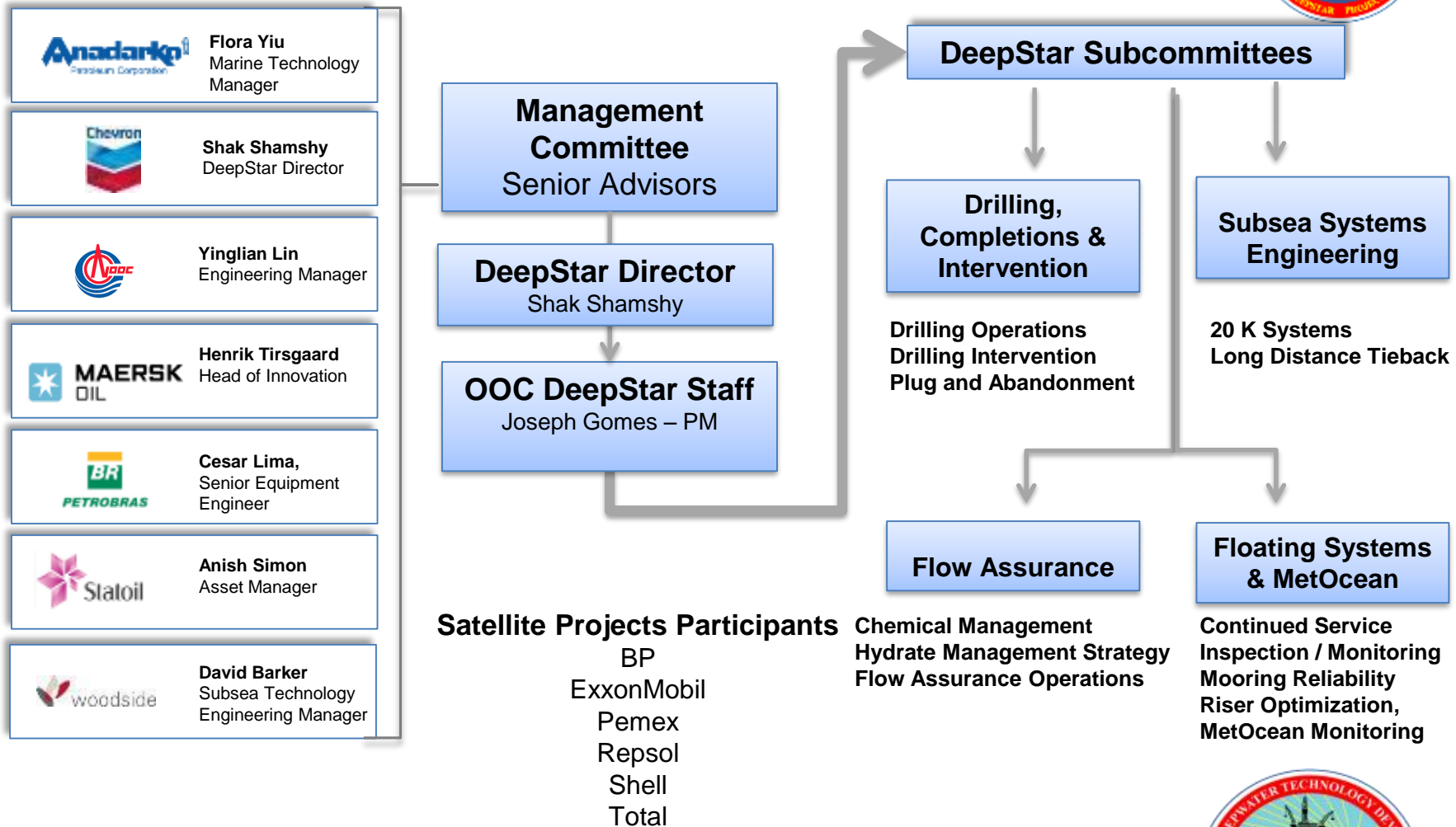
- Integrity Management of Marine Systems (C)
- Low-Cost FPSO Alternative (C)
- Improving Mooring Reliability & Better Standards (C)
- Riser Continued Service (C, S)

Subsea and Systems Engineering - Subcommittee

- Subsea Chemical Storage & Injection (C)
- Long Distance Subsea Tieback (C)
- 20 K Systems Validation (S)



DeepStar® Management and Committees



DeepStar®

Global Offshore Technology Development Consortium 26 Years of Industry Excellence

DeepStar Recruiting Members for DeepStar 2017

DeepStar is the industry's longest running and most successful offshore technology development consortium and it has generated significant value by providing technology transfer to its members and the industry. There is an increased need in the industry for an operator-driven, collaborative technology development program.

DeepStar® CORE + Satellite Model

(Focused CORE R&D Program + Satellite Projects Model)

CORE R&D Program

DeepStar CORE Program focuses on all members' common collaborative technology needs; discusses industry technology issues and develops ideas for larger, elective satellite projects.

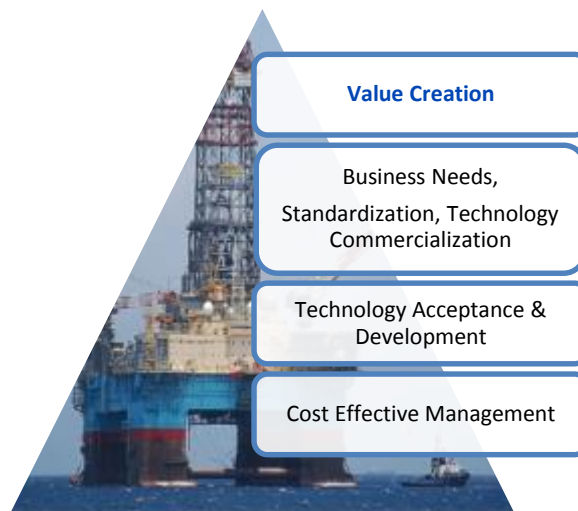
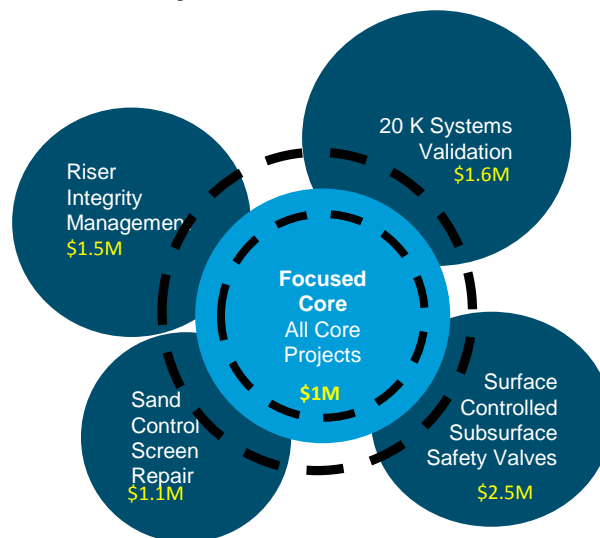
Satellite Projects

Focuses on elective Satellite Projects in which the technology advancement is aided by collaborative among interested parties.



Satellite Participants:
BP
ExxonMobil
PEMEX
Repsol
Shell
Total

DeepStar 2017 Model



DeepStar® Technical Subcommittees:

- **Drilling, Completion and Intervention**
 - Drilling Operations
 - Drilling Intervention & Repair
 - Plug & Abandonment
- **Flow Assurance**
 - Hydrates
 - Insulated Pipelines & Equipment
- **Subsea Systems Engineering**
 - 20 K Systems Review & Validation
 - Long Distance Tieback
 - Subsea Chemical Storage & Injection
- **Floating Systems & Met-Ocean**
 - Integrity Management
 - Localization for UAVs
 - Low Cost FPSO Alternative
 - Marine Growth Models
 - Mooring Reliability
 - Riser Continued Service
 - Robotic Inspection

Potential Technical Subcommittee

- **Operations**
- **Subsurface (Geosciences + Reservoir)**

DeepStar Membership Fee

- **Member (\$80,000 - annual)**
- **Associate Member (\$15,000 - annual)**

Join us at new DeepStar!

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