Frontier Deepwater Lower Tertiary Drilling and Production System

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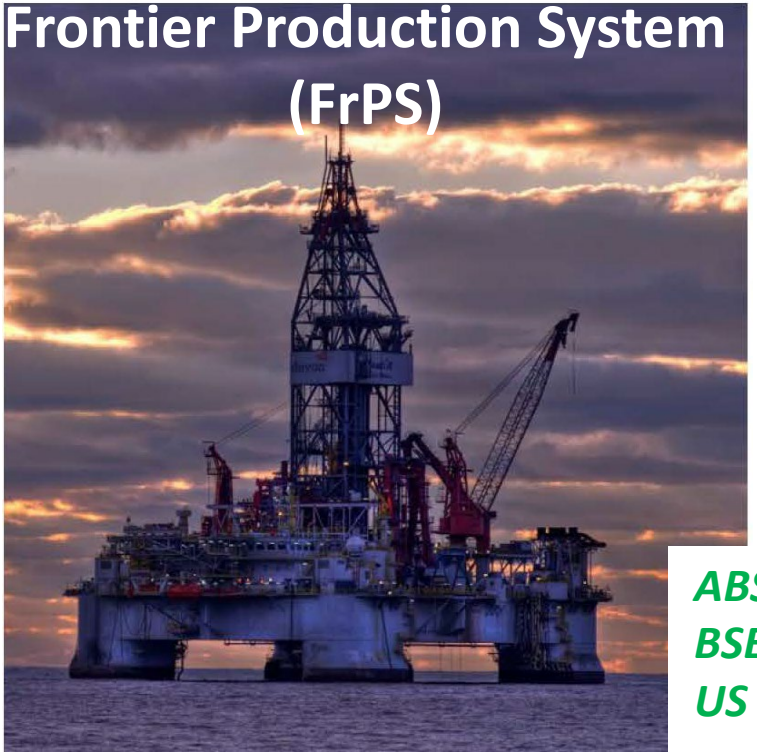
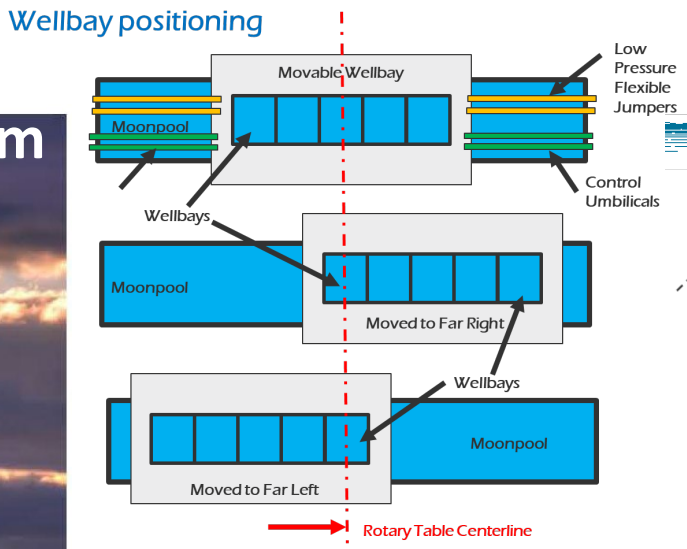
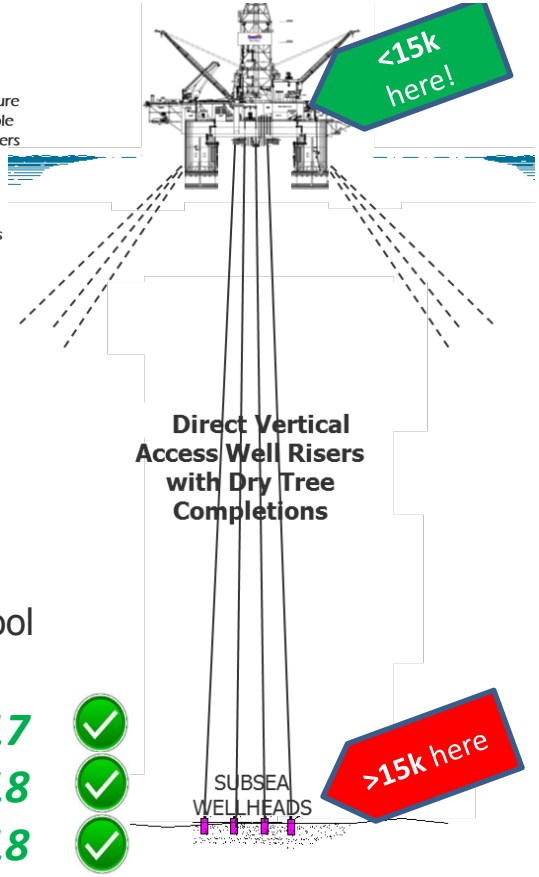
Making Discoveries Like the Lower Tertiary Profitable at Less Than $50/bbl





Movable Wellbay in FrPS Moonpool



ABS Approval in Principle	*2017*
BSEE Concept Review	*2018*
US Patent 9,976,364	*2018*

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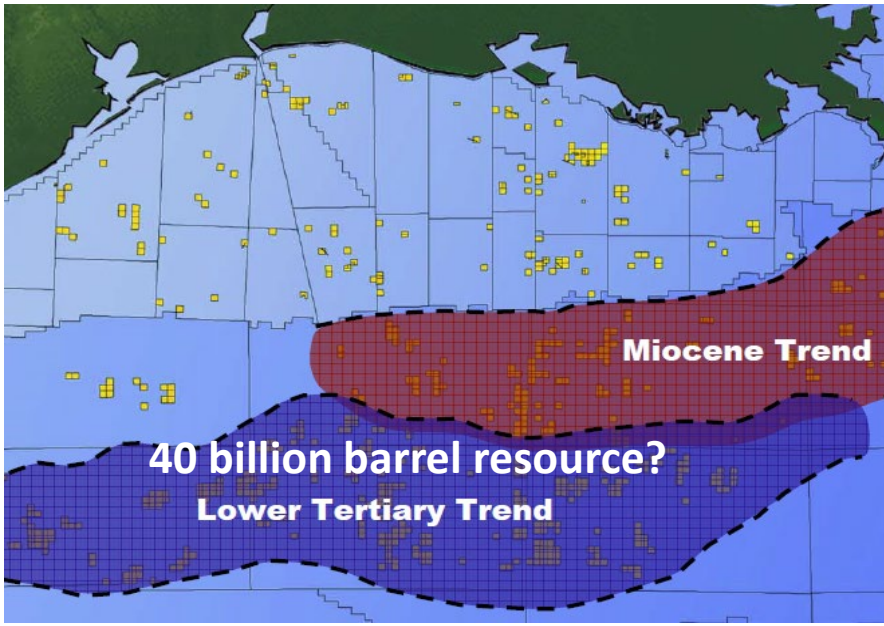
The Commercial Setting for GoM In a Critical State

- Daunting subsalt reservoir uncertainty
  - Faulting and connectivity
  - Reservoir drive mechanisms
  - Sand control & completion
  - Intervention frequency
- Very high drilling and completion costs
  - 35,000' wells requiring >250 days
  - 20K MODU (BOP, completion and intervention system) with 20K back up?
- 1st time 20k subsea equipment and HIPPS demands massive CAPEX, OPEX and RISKEX over the long term



➔ Lack of reservoir and completion performance information means huge, riskier bets, so projects are being deferred or cancelled

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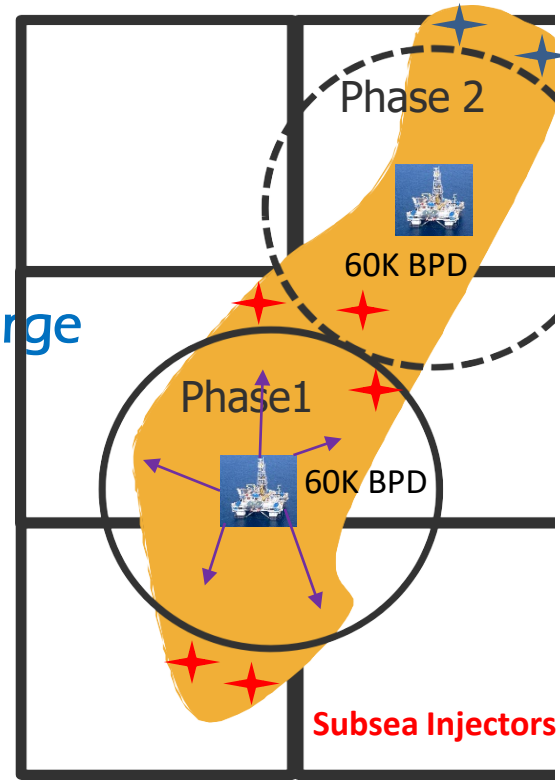
Low Cost - Low Risk Phased Approach

- Convert 6th Gen Semi using 5-well dry tree movable wellbay
  - Newbuild option enables 10+ wells slots
- Use of simpler proven technology reduces risk
  - TLP well systems reduce technology complexity,
  - Equipment can be ordered today
- Sanctioning a phased system avoids the need for a large appraisal program for full field development
  - Each phase can be economic at less than $50/bbl
  - Dry trees increase recovery adds 15% - 25% more oil
- Provides critical reservoir, drilling, completion and intervention information to de-risk full resource development



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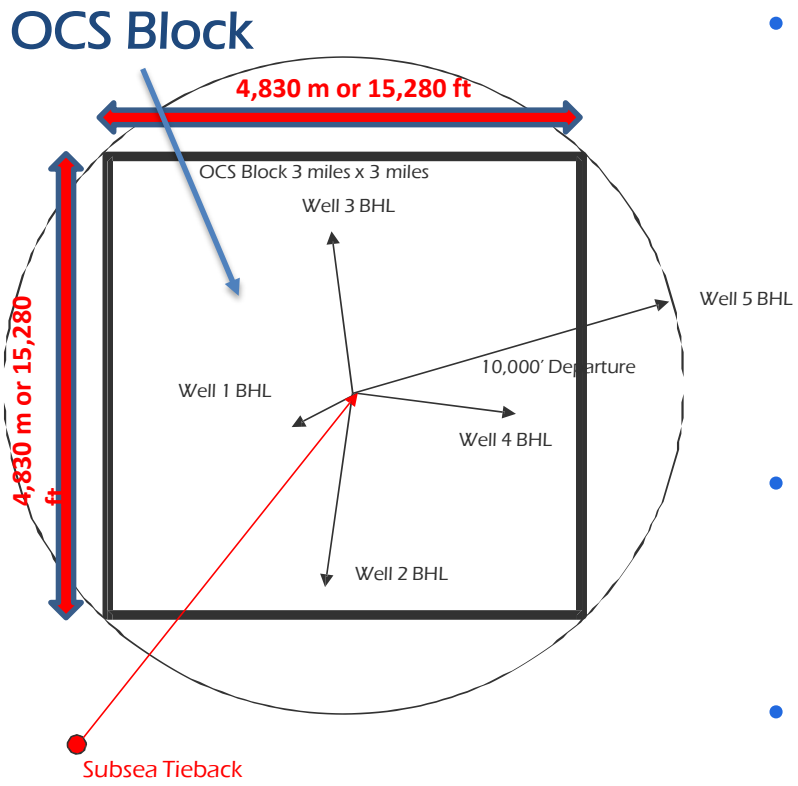
Like Onshore Shale

"FrPS on the Pad" – "Drill the Cube!"



Subsea wells can be drilled and tied back to the FrPS as 20K technology and equipment becomes cost effective.

- Directional drilling area is HUGE
  - Project sanction is based on reserves that can be accessed from 1 drillsite
  - Fewer appraisal wells and faster project schedule results in ½ the cost and time to develop
- Much cheaper sidetracks result in the best bottom hole locations and maximize recovery
- Inexpensive dry tree interventions will significantly increase total resource recovery
  - Downhole pumping with (ESP's)

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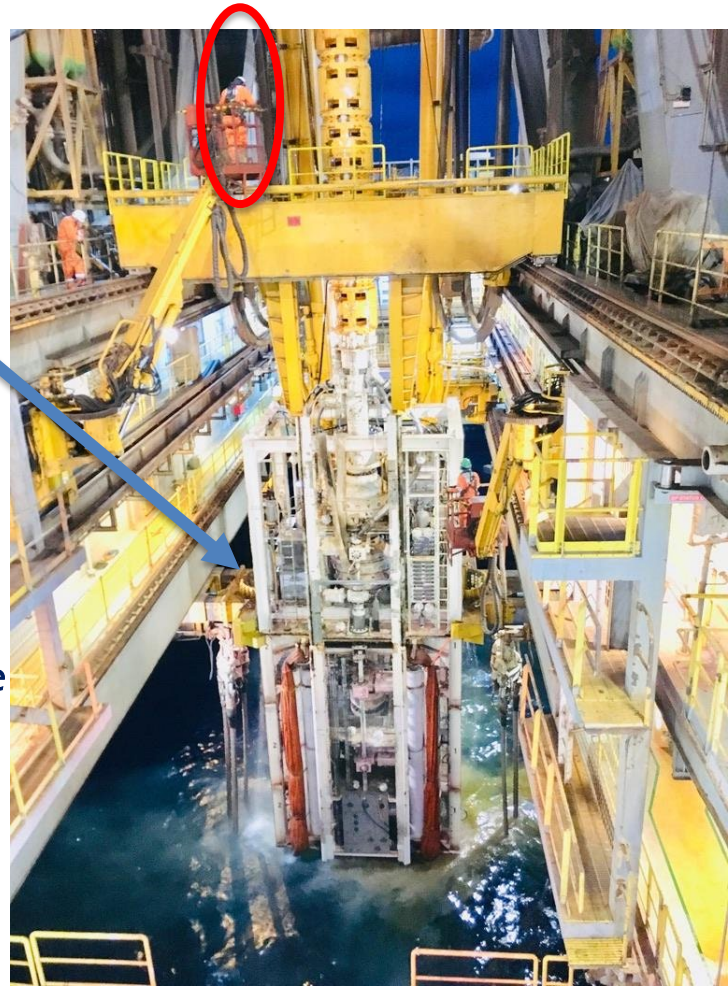
FrPS 6th Gen MODU Conversion Concept

Shipyard Conversion Scope

- Remove subsea BOP, drilling riser and DP equip
- Install a permanent polyester mooring system
- Install 65+kbpd production module
- Install 5 well movable wellbay



Resulting Drilling and Production Unit

- A safer permanently moored platform
- Fully rated dual barrier well systems
  - Simple, reliable direct hydraulic surface BOP
  - Strong enough to bullhead with full pressure from the surface BOP
  - Simpler accessible downhole completion equipment
- Full capability drilling and completion system
- 65 kbd production facility

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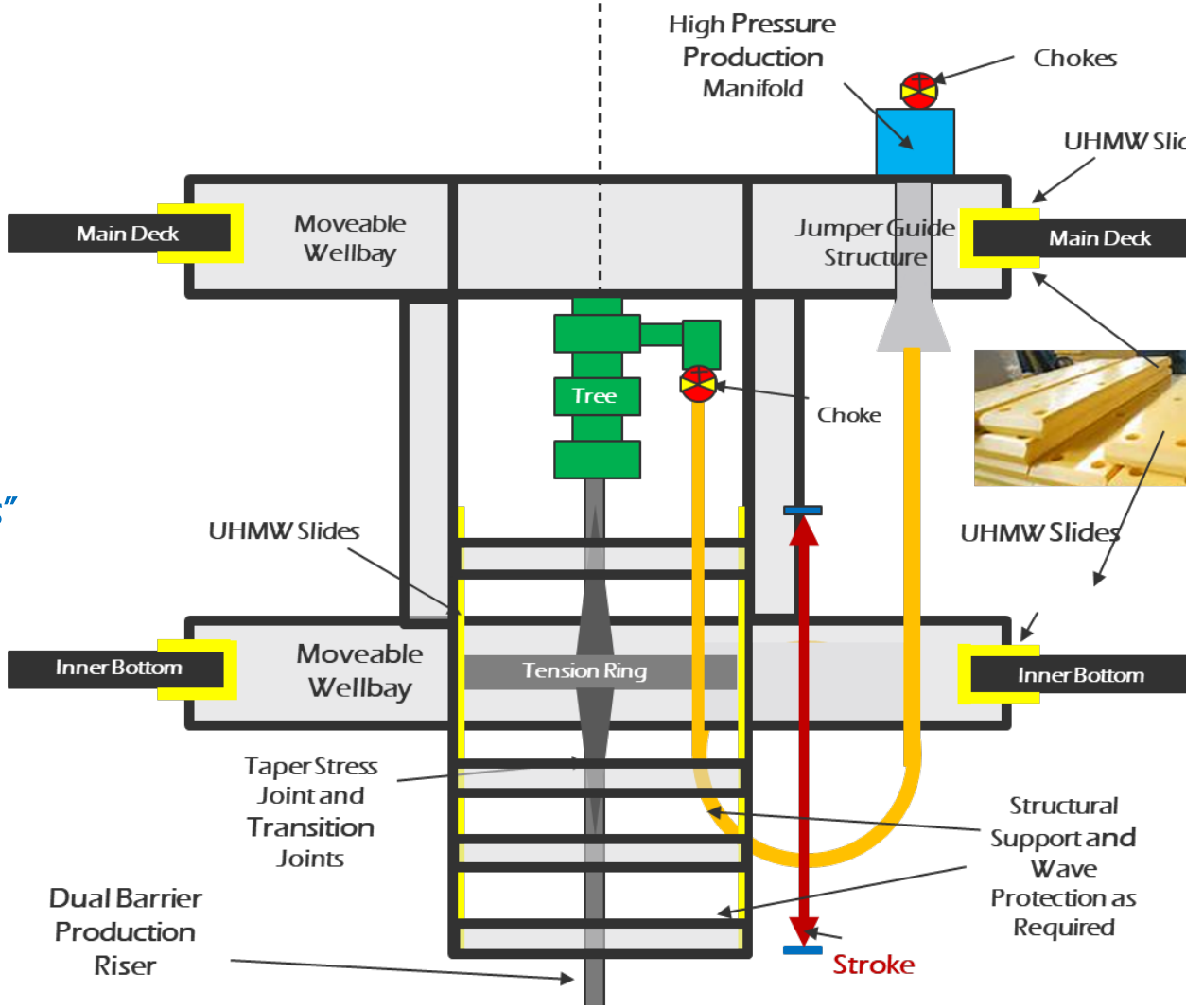
Patented Movable Wellbay

- Risers have syntactic foam buoyancy to reduce tensioner size to 4 x 250 kips per slot
- Risers stroke freely on tensioners in all winter storm conditions (100 yr)
- Risers allowed to hit the "stops" and stretch for survival conditions during 1,000 year hurricane (rig abandoned).
  - OrcaFlex FEA shows risers never exceed 80% of yield during 100 year hurricane.
  - Tree and BOP remain inside deck when riser is on downstop



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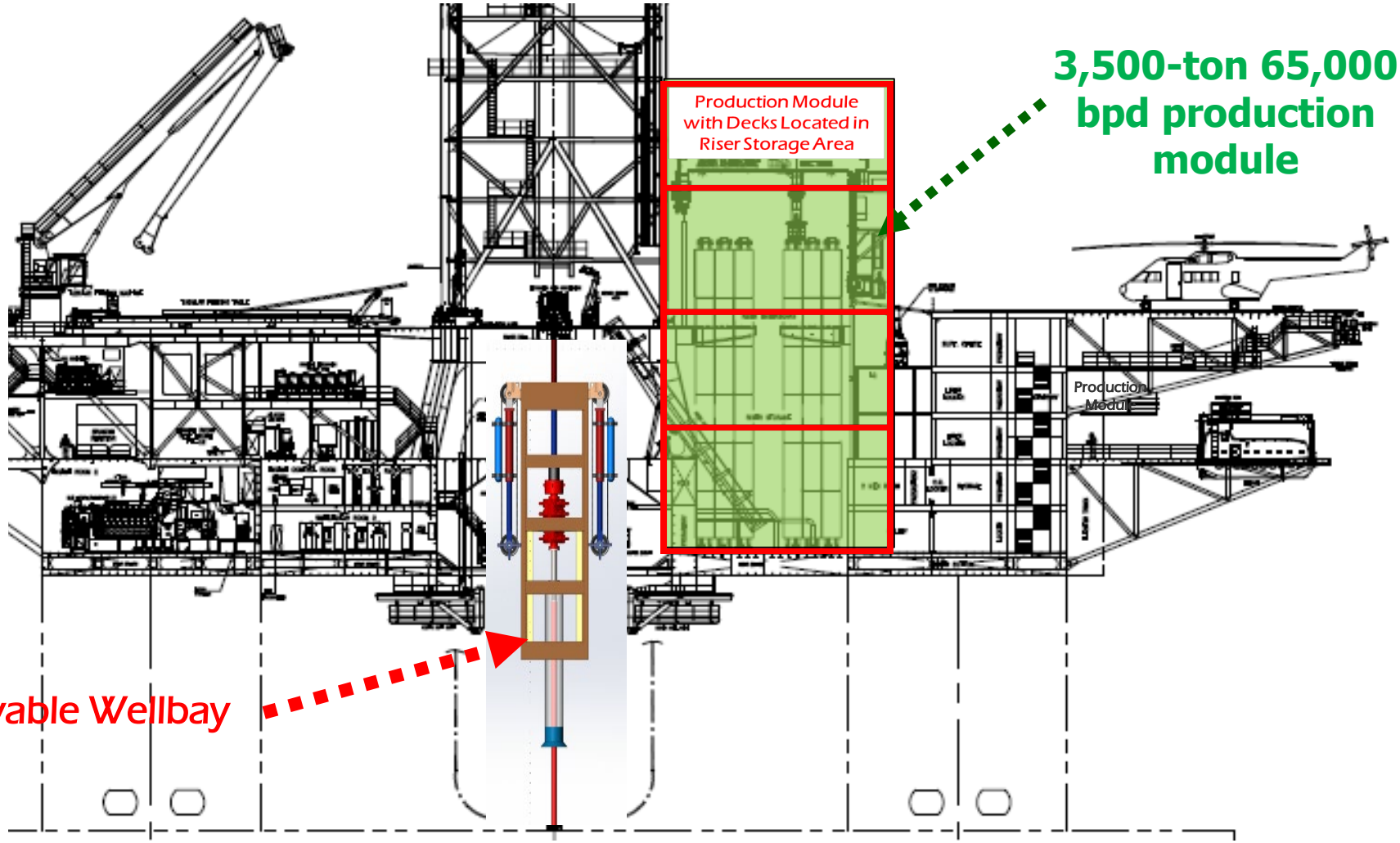
Shipyard Modifications Required



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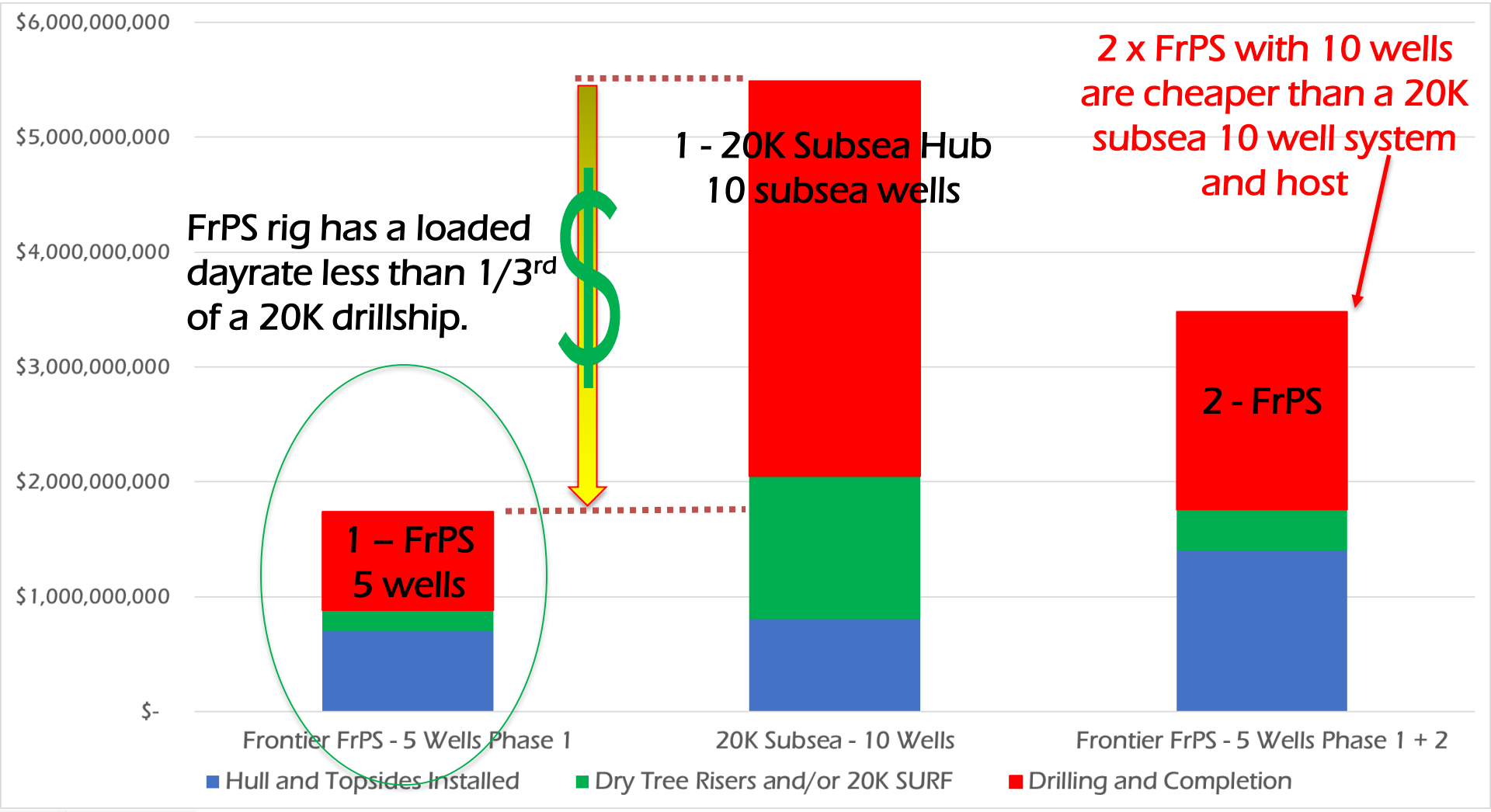
Dramatic Cost Savings Delivered



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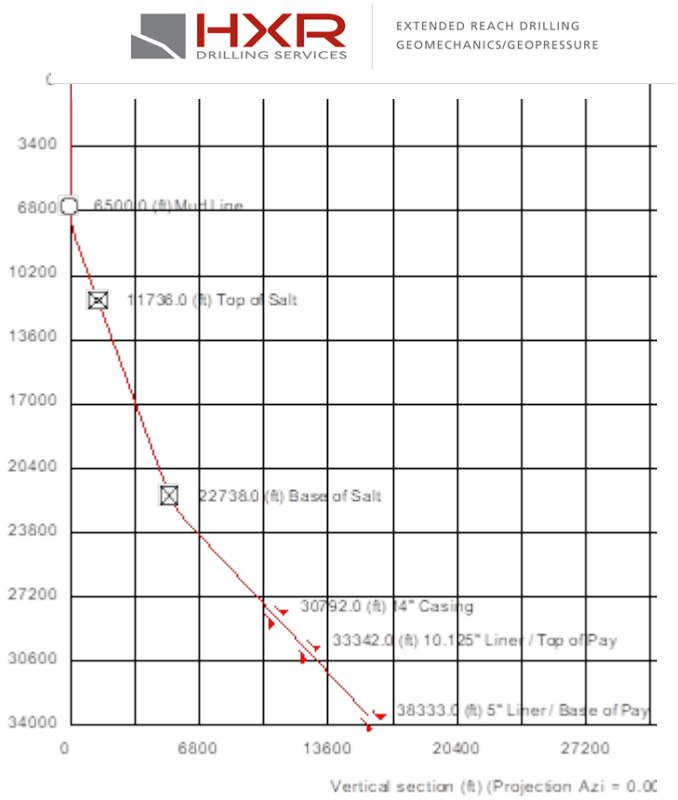
FrPS Start of Operations
5-well Drilling Plan

Pre-DRILLING Using Fleet 15K MODU

- Drill & case #1 & #2 to full depth
- Drill & case wells 3, 4, & 5 through 14"

Install FrPS into Pre-Installed Mooring System

- Run/connect/hang-off five (5) outer risers (16" OD)
  - Establishing full hurricane survival status in 1 week
- Run full pressure-rated inner riser (11-3/4") and complete #1
  - ➔ Start flow of FIRST OIL
    [Can use 13-5/8" surface BOP]
- Run full pressure-rated inner riser and complete #2
- Directionally Drill & Complete wells 3, 4, and 5
  - Use Combo riser strategy – drill to top of reservoir thru outer riser.
  - Run dual barrier inner riser to drill reservoir section.



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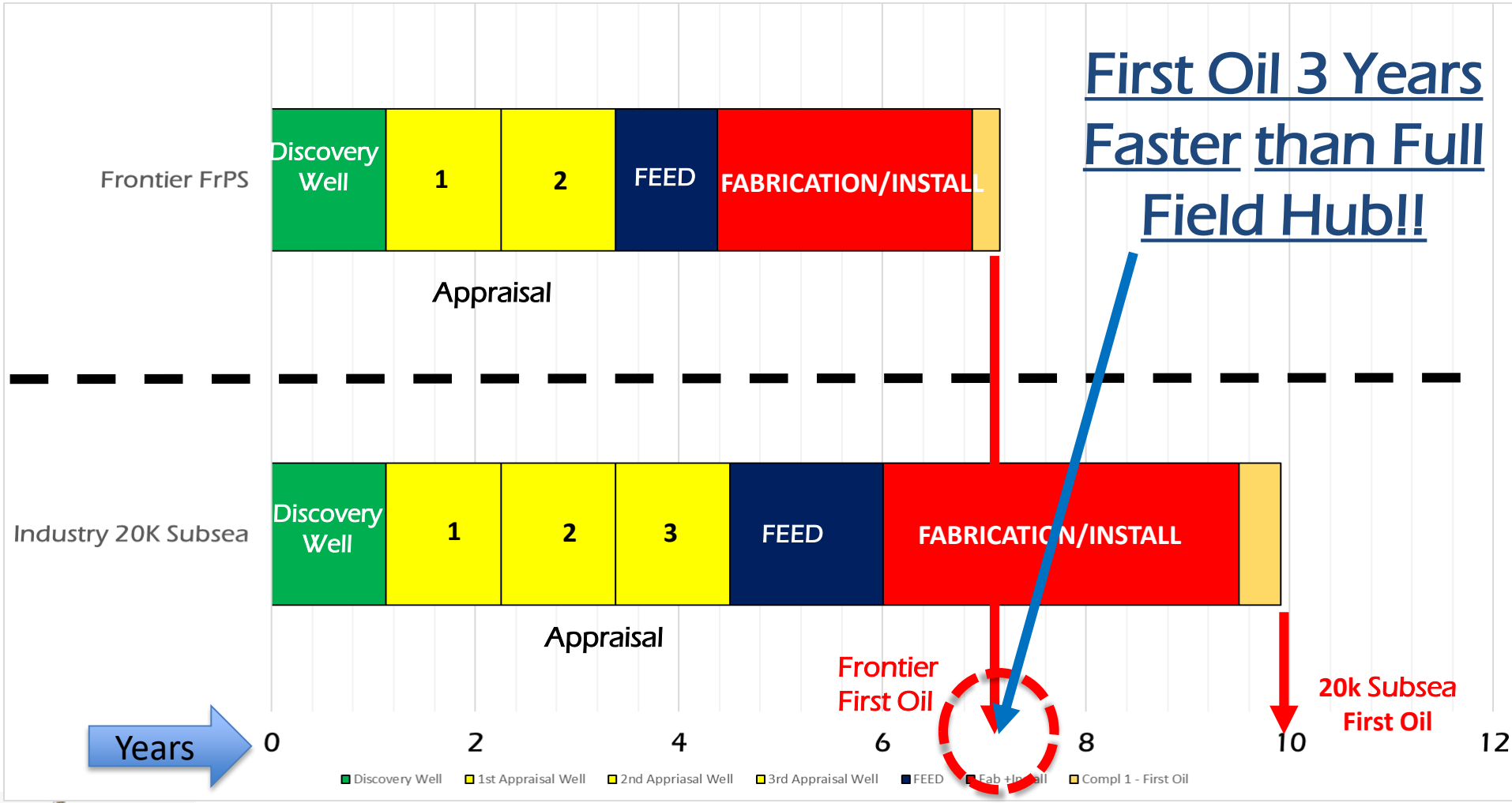
Dramatic Time Savings Delivered



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Don't Skid the Rig – Skid the Wellbay!

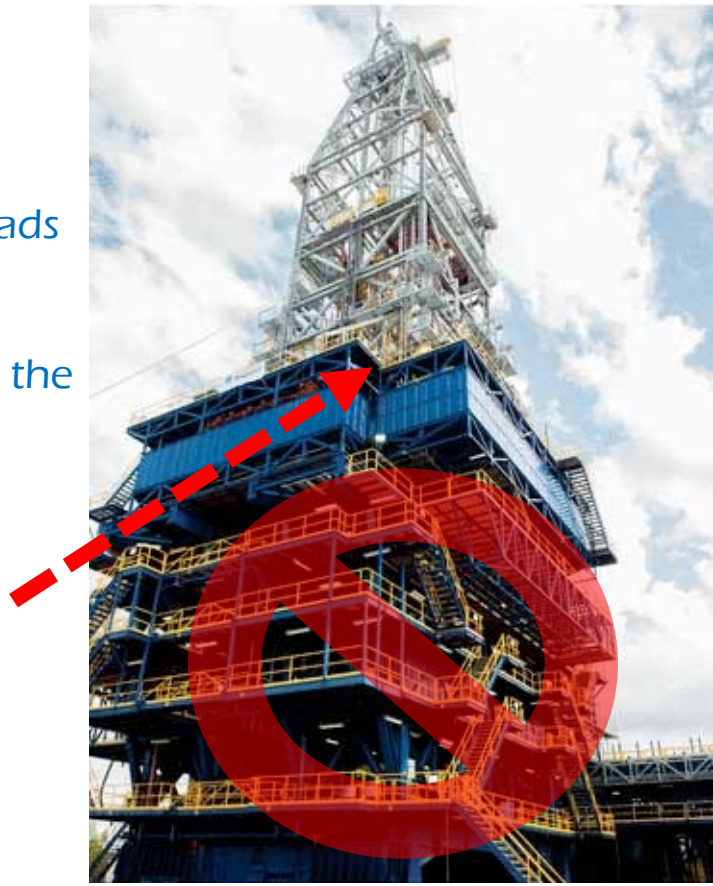
Rather than skidding this MOUNTAIN

- Rig can be statically integrated like a MODU
  - Lower CG means less acceleration and smaller storm loads
    - Huge "building size" movable sub-base eliminated
  - Utilities are simpler with fewer interfaces rather than on the moving sub-base
  - Reduces platform size and costs for TLP, Spar and Semi

Other Applications

- Direct vertical access to subsea wells
  - Subsea trees directly beneath the platform with ESP's
  - Subsea caisson's with ESP's and remote subsea wells

2.0MM# Big Foot Rig



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Movable Wellbay Commercial Advantages

Provides technology to convert under utilized MODU's to profitable units

- Less than ½ the cost and schedule of a full field system
- Phased approach generates cash flow and reservoir data years sooner
  - Sanction project with fewer appraisal wells
  - Project generating profit for Operator at well below $50/bbl
  - Reservoir performance information to determine best development strategies for full field
  - No need for huge, risky investment in 20K subsea, 20K drillship or HIPPS

Can be used on purpose built TLP's, Spar's or Semi's

- 10 or 15 well slots for direct vertical access to subsea wells
- Rig can be located statically, more simply and much more cost effectively
  - Lower CG will reduce platform and mooring system size and cost

Movable Wellbay Safety Advantages

Fully rated dual barrier well systems with surface BOP much safer

- Proven technology with much lower costs
- Direct hydraulic controls provide reliable surface system (BOP and trees)
- Equipment easily inspected and maintained
- Well control more reliable
  - Can bullhead with full pressure at the surface
  - Eliminates the Macondo analog
- Better performance downhole ESP implementation
- Historically documented 15 – 25% more oil recovered with dry trees
- Fewer vessel and manhours offshore reducing HSE exposure

THANK YOU!

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