Overview

Key Points
✓ A Novel approach to WHP cost saving.
✓ Standardised components.
✓ Proven technologies, re-configured.
✓ Suction Buckets, rather than Driven Piles.
✓ Jackup Rig, rather than Barge Installed.
✓ Re-usable.
Standardisation: A Route to Cost Savings

<-- range of water depth -->

<-- variable deck size, well count and soil type -->

Icon (2017)
Standardisation: Suction Bucket WHP
Suction Bucket WHP: Barge Installed
Rig Installed WHPs

Icon, 2017
Rig installed: Lower Cost & Risk

Tornado Diagram: Why the early focus on Transport & Installation (T&I)?
- Look where the risk lies, deal with major T&I risks first.
Rig installed: Earlier production

Derrick Barge Installed
- Design
- Procurement
- Fabrication

Loadout
- Derrick barge leaves then rig arrives
- No overlap

Inst
- Install
- Drilling
- First Oil

Schedule Acceleration 3 to 6 months typically

Substructure
- Design
- Procure
- Fabrication

Loadout Substructure
- Loadout sides
- Additional Time for Topsides

Topsides
- Design
- Procure
- Fabrication

Inst
- First Oil
Rig Installed WHPs
Rig Installed: Suction Bucket WHP
Foundation Capacity – A key issue

Tracks and Intensity of All Tropical Storms

Cyclic loading from wind and wave

τ_a = Average load
τ_cyc = Cyclic load

Note that there is a range of average and cyclic loads over the period of the design event
Cyclic soil response is a function of both the cyclic and average shear.

After Andersen (2015)
Foundation Analysis

(Jostad et al. 2015)

(Sturm, 2017)
Value proposition: Standardisation

Major savings from:

✓ < $ Engineering, modular design.
✓ < $ Procurement, from scale.
✓ < $ Fabrication Productivity & Quality, from continuous improvement.
✓ < $ Installation, as can use wider range of Lift Vessels or the Jackup Rig.
✓ < $ If Suction Bucket = Faster, Relocatable & Easier decommissioning
Value proposition: Rig installed

Major savings from:

✓ < $ Enables elimination of additional Derrick Barge.
✓ < $ Enables selection of a wider range of less expensive pipeline or flowline installation options.
✓ < $ Greater control of schedule & risk.
✓ < $ Acceleration of First Oil date.
✓ < $ If Suction Piled, Faster Install, Relocatable & Can Decommission with Rig used for P&A.
✓ < $ Competition: Barge or Rig Can be used
Rig Installed Project Org Chart

E&P Company (Operator)

Drilling Department
- Drilling Manager
  - Drill Rig Contract
  - Vessel Contracts
  - Cementing
  - Directional Drilling
  - etc...
  - Installation
  - Transportation

Project Department
- Facilities Manager
  - Early Input
  - Concept / FEED
  - Engineering
  - Fabrication
- E, T&I Consulting
  - Transportation
  - Installation

as service Contractor
Summary/ Any questions

- Novel combination of reliable technologies
- Fast, cost-effective
- Reusable
- Reduced material use
- Accelerated first-oil