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TECHNOLOGY
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ASIA

20 - 23 March 2018
Kuala Lumpur, Malaysia

EXCELLENCE IN ASIA

OTC-28263-MS
Rapidly Rig Installable and Re-Usable Suction Bucket Wellhead
Platforms

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2018.otcasia.org | #otcasia | #derrickandsoo

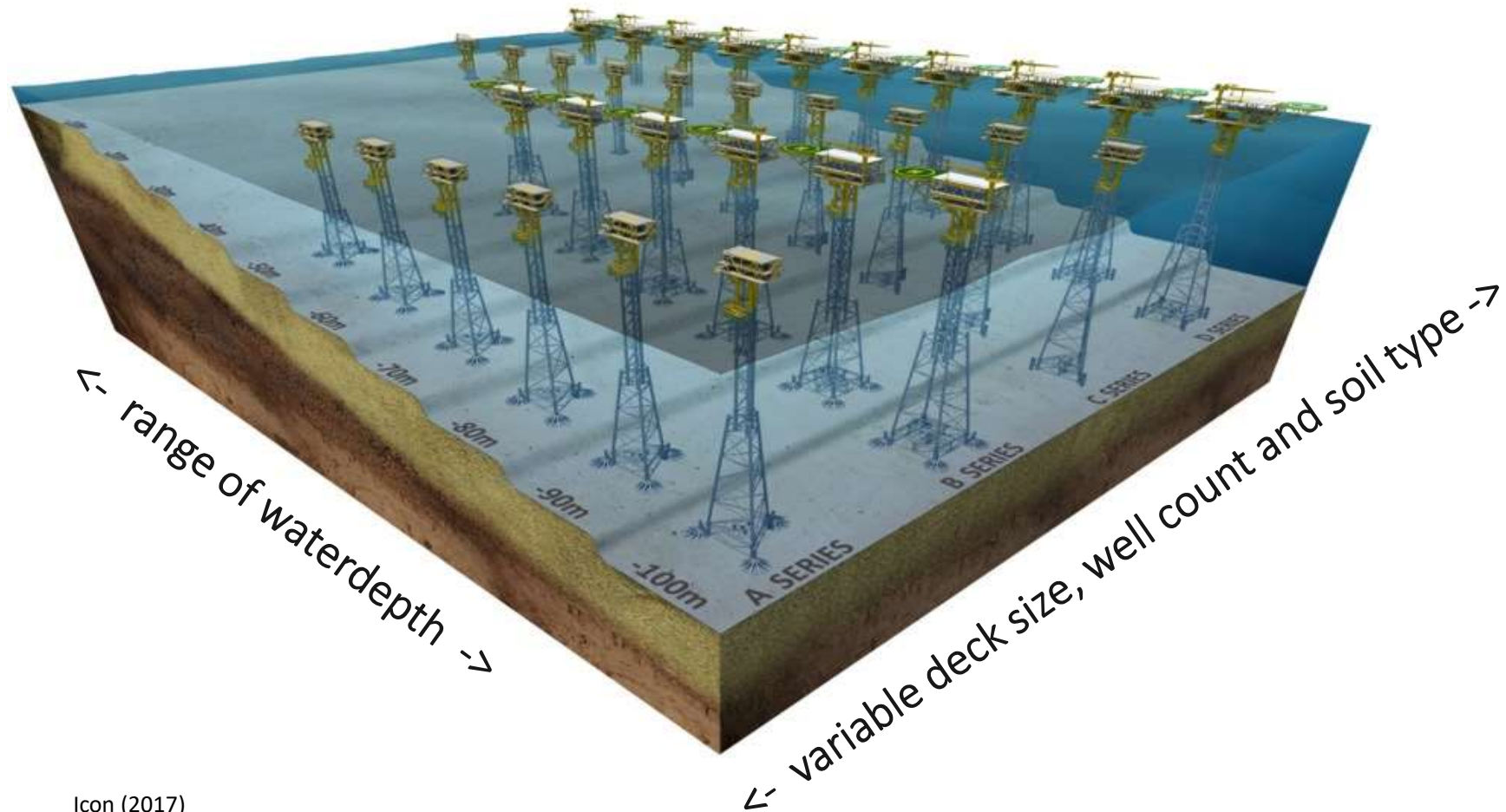
Overview

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.

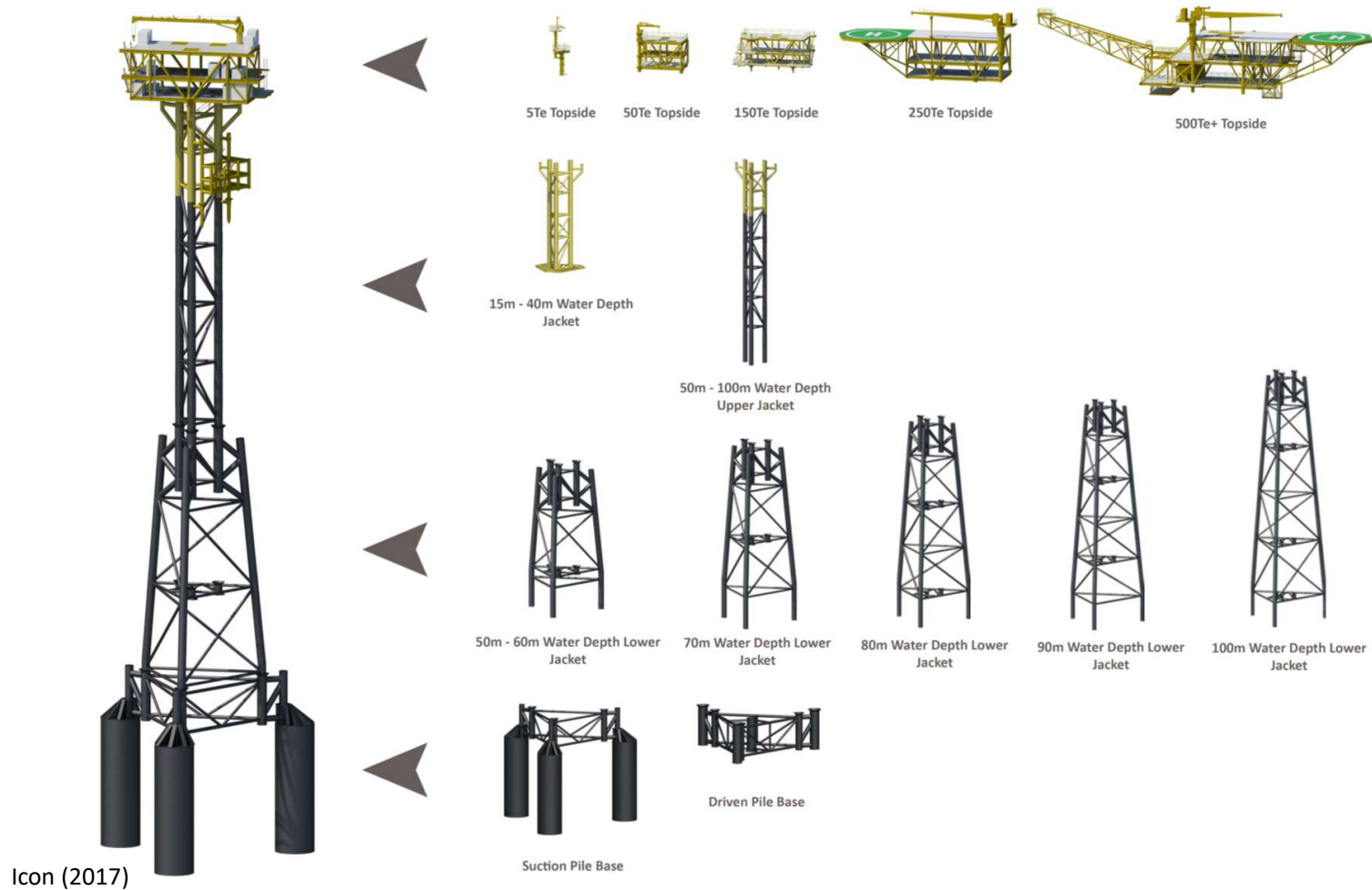


Standardisation: A Route to Cost Savings

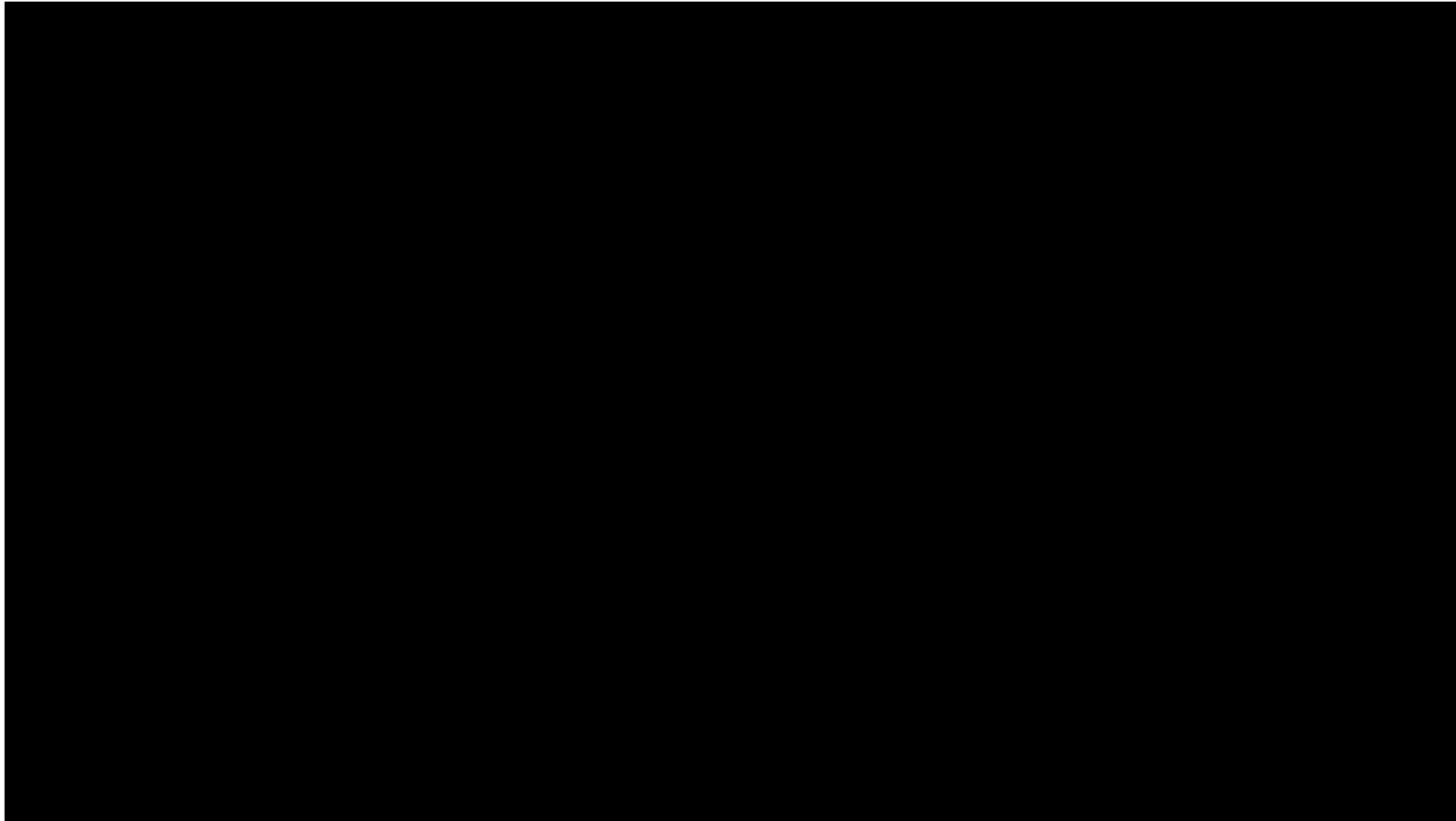


Icon (2017)

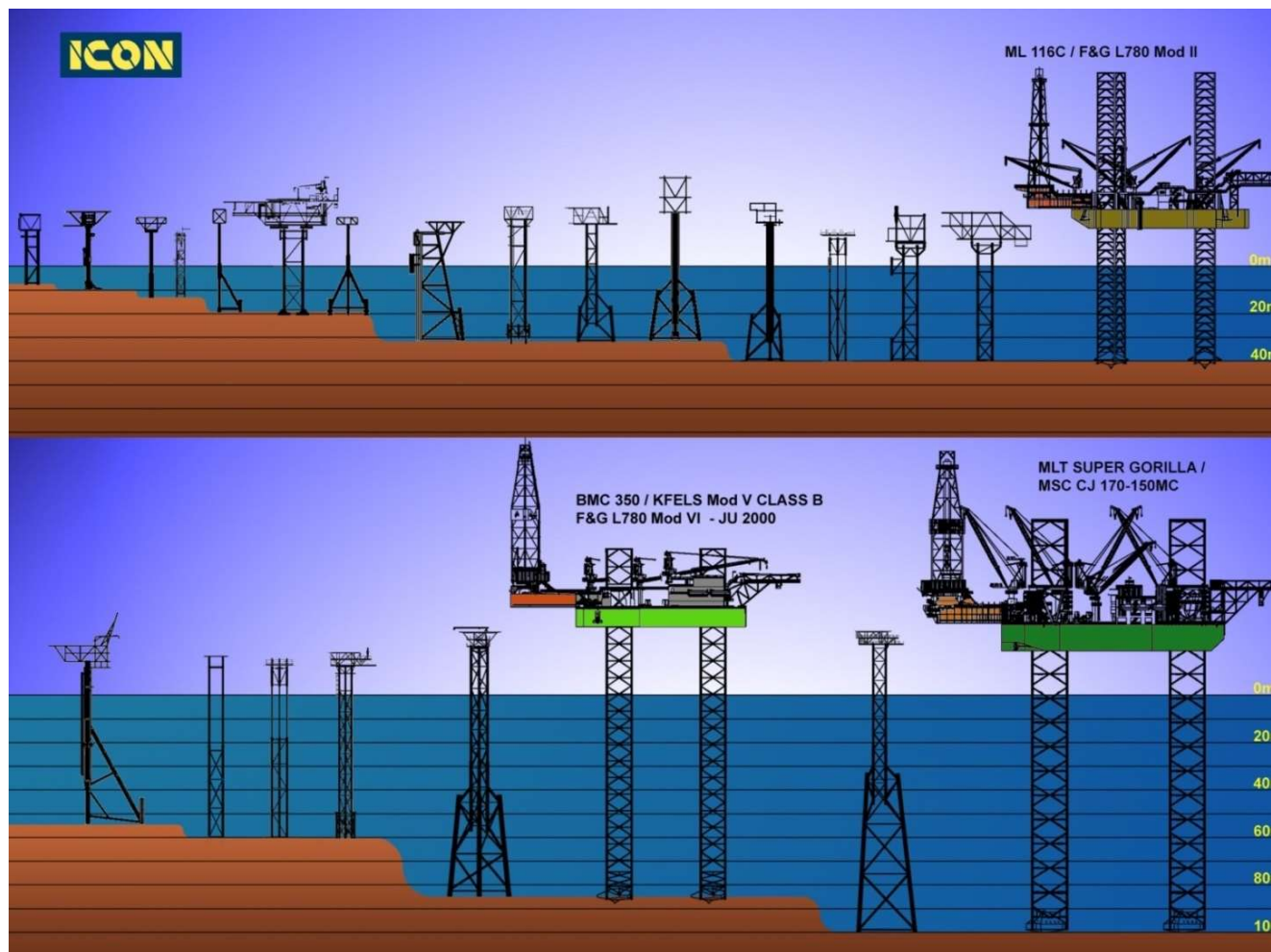
Standardisation: Suction Bucket WHP



Suction Bucket WHP: Barge Installed



Rig Installed WHPs

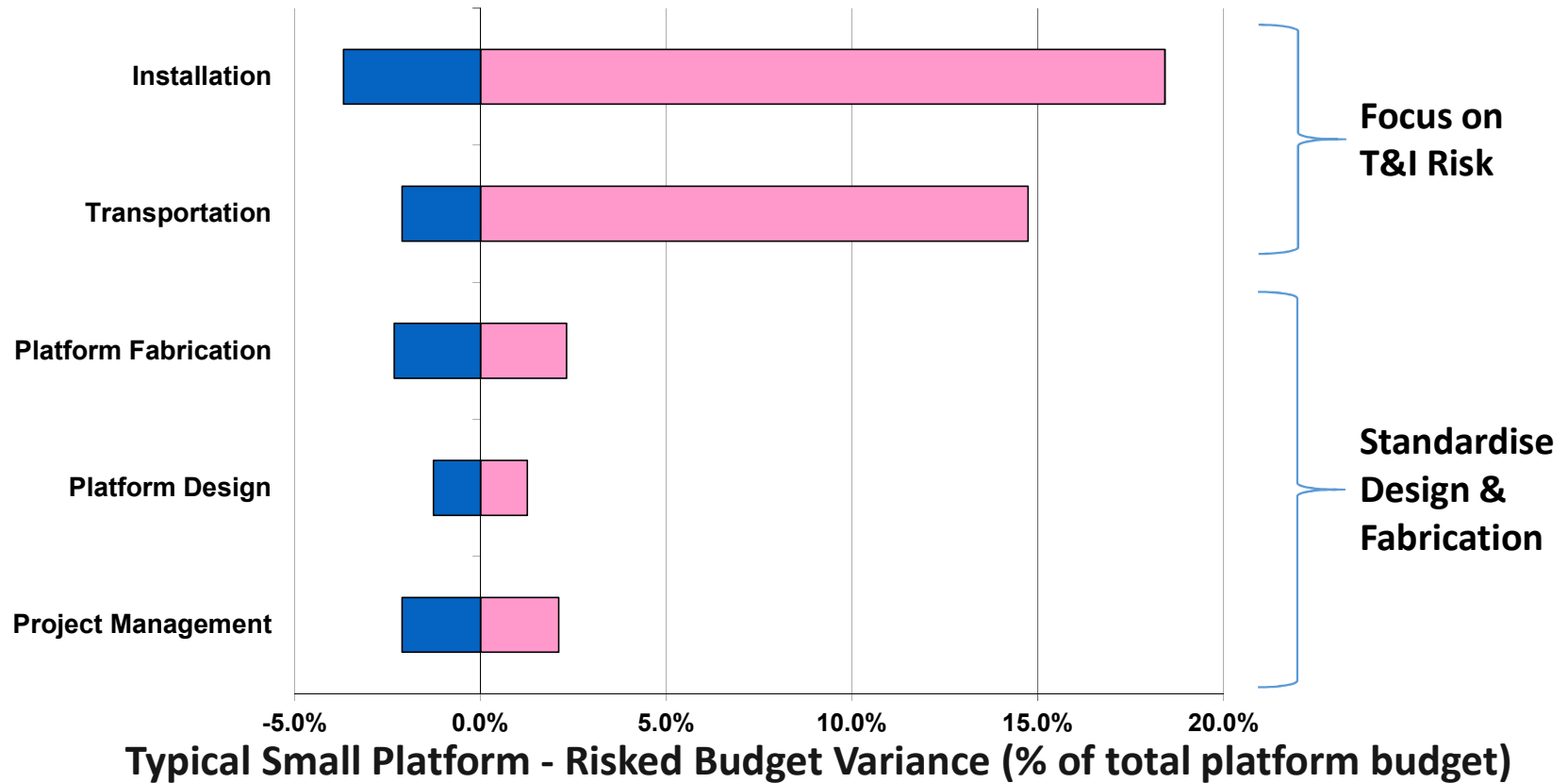


Icon, 2017

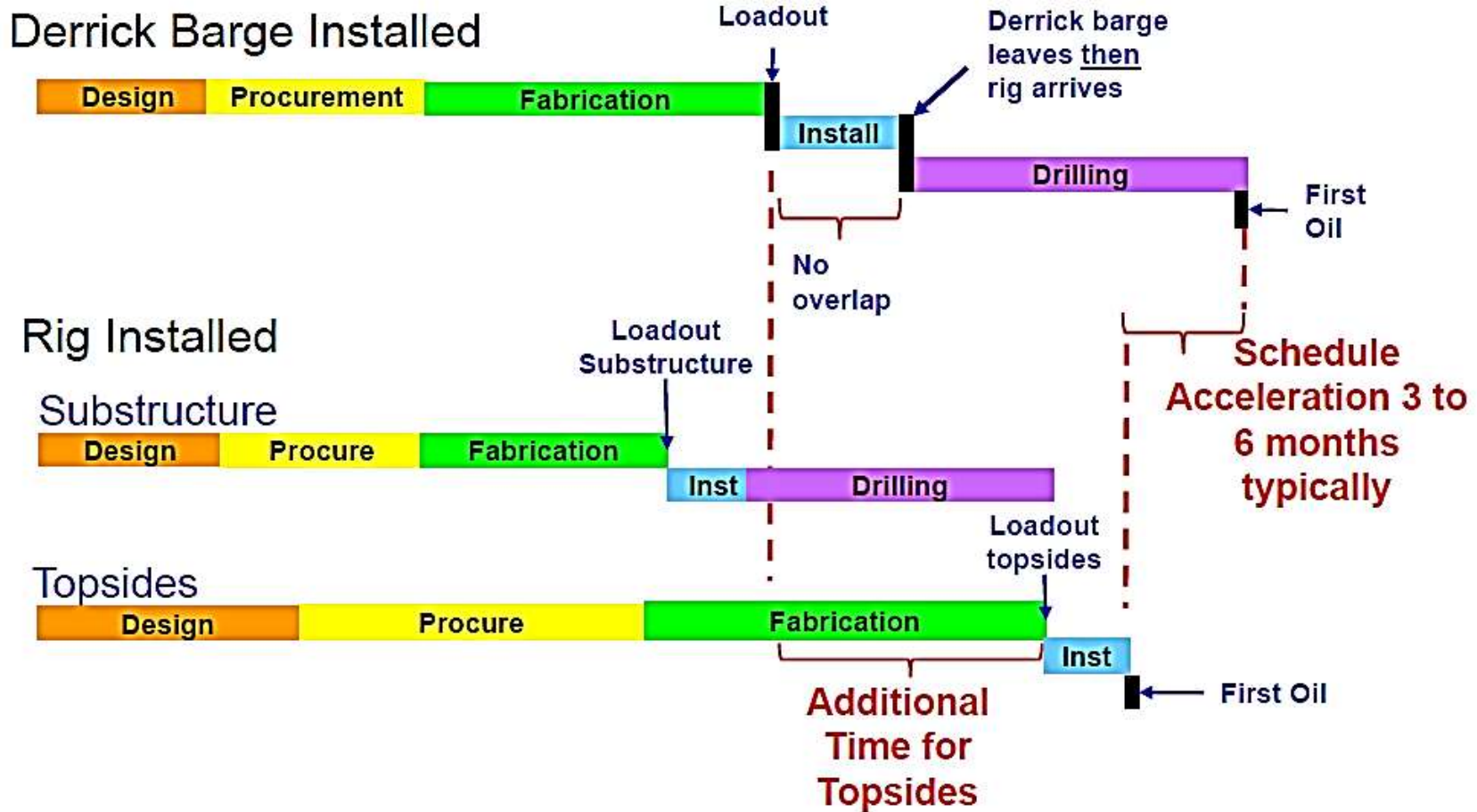
Rig installed: Lower Cost & Risk

Tornado Diagram: Why the early focus on Transport & Installation (T&I) ?

- Look where the risk lies, deal with major T&I risks first.



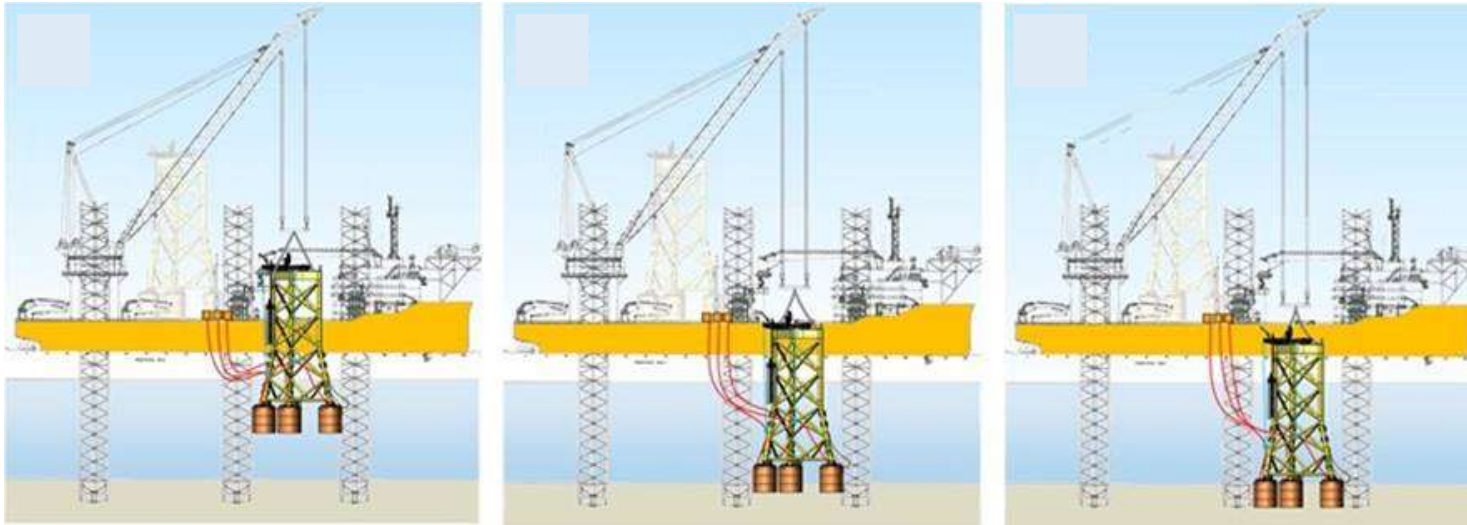
Rig installed: Earlier production



Rig Installed WHPs



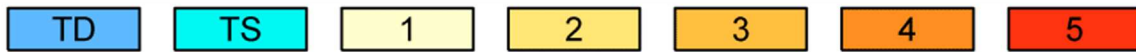
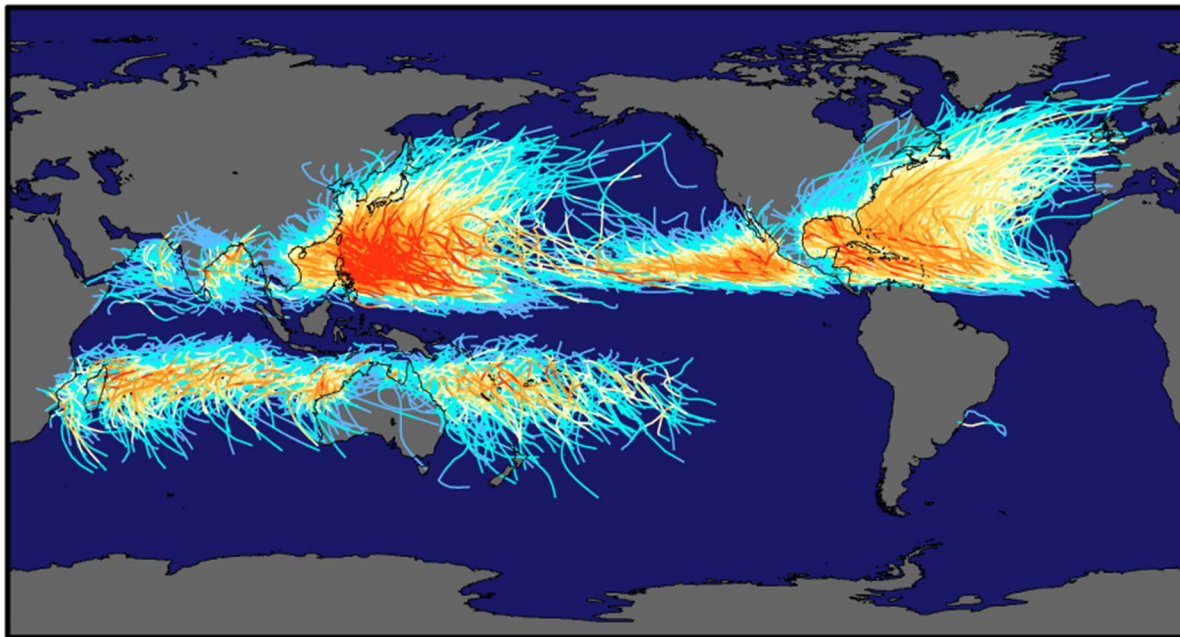
Rig Installed: Suction Bucket WHP



ngi & icon

Foundation Capacity – A key issue

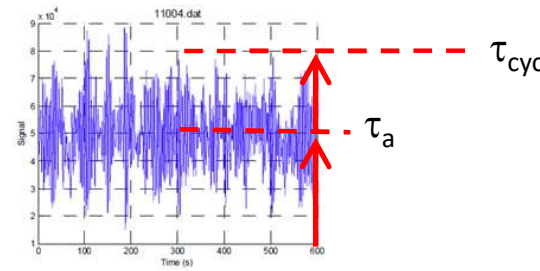
Tracks and Intensity of All Tropical Storms



Saffir-Simpson Hurricane Intensity Scale

earthobservatory.nasa.gov

Cyclic loading from wind and wave



τ_a = Average load

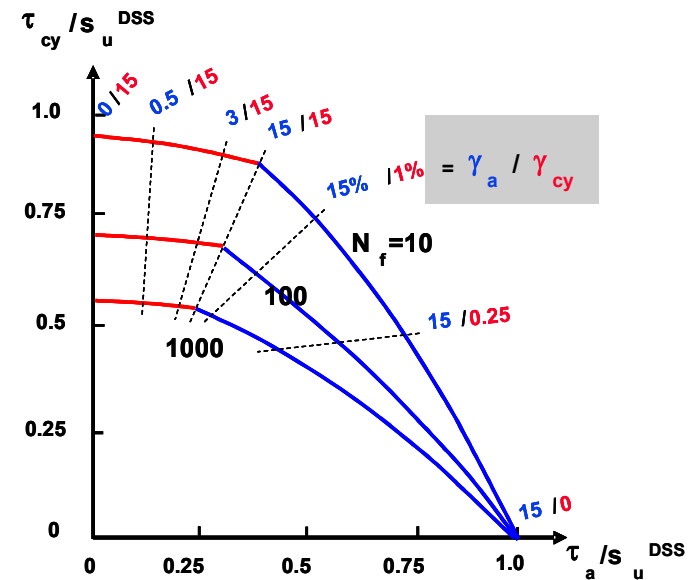
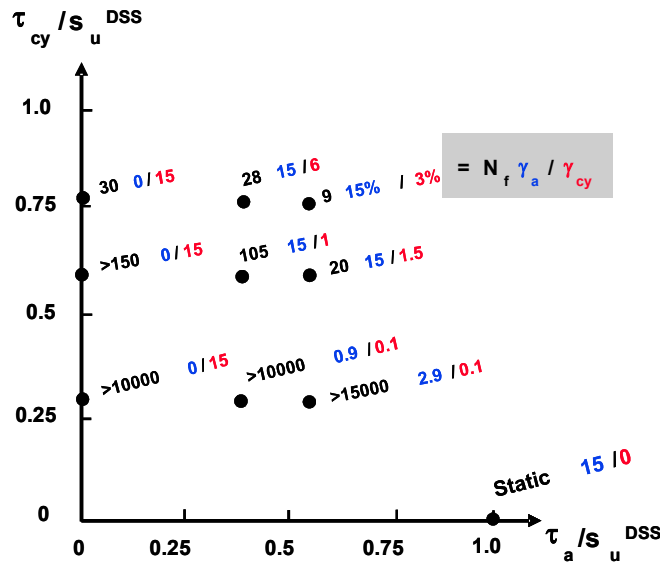
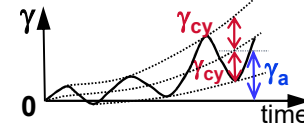
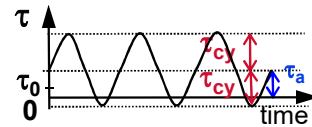
τ_{cyc} = Cyclic load

Note that there is a range of average and cyclic loads over the period of the design event



Foundation Design – Laboratory Testing

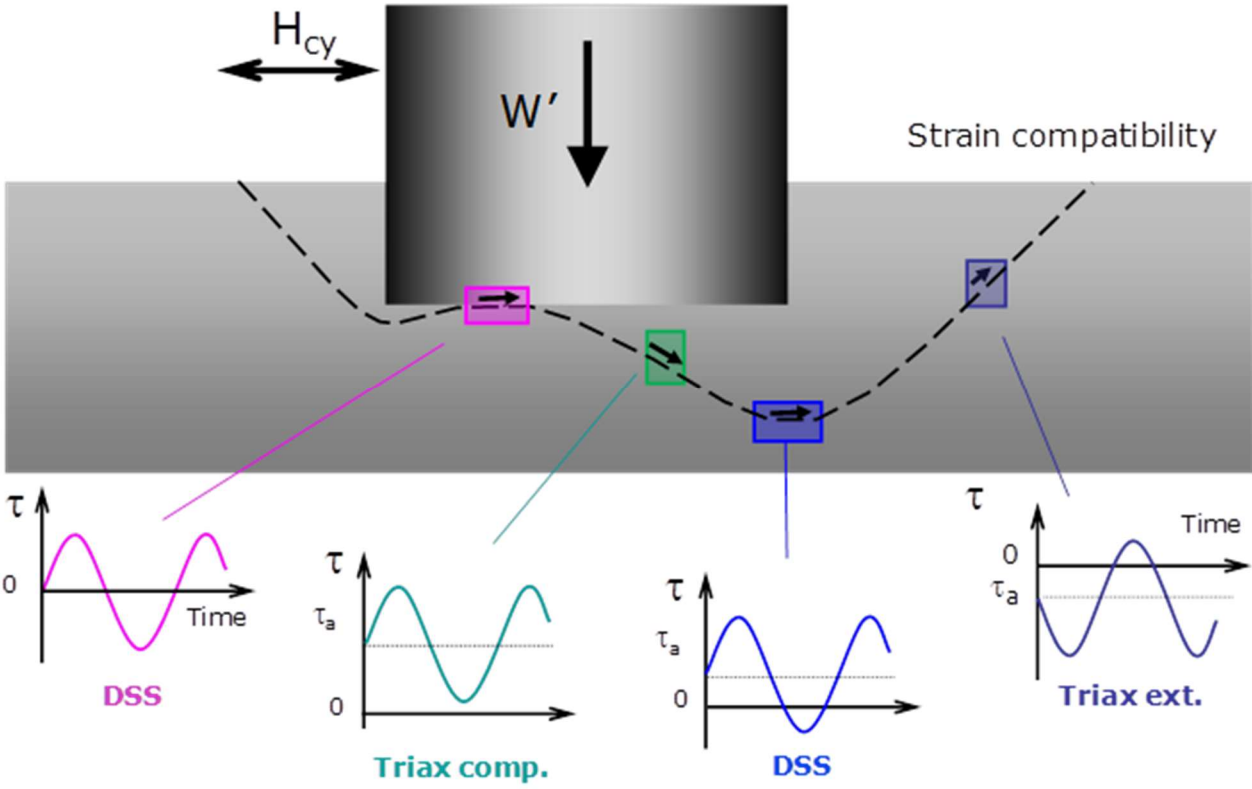
Direct Simple Shear (DSS) Test



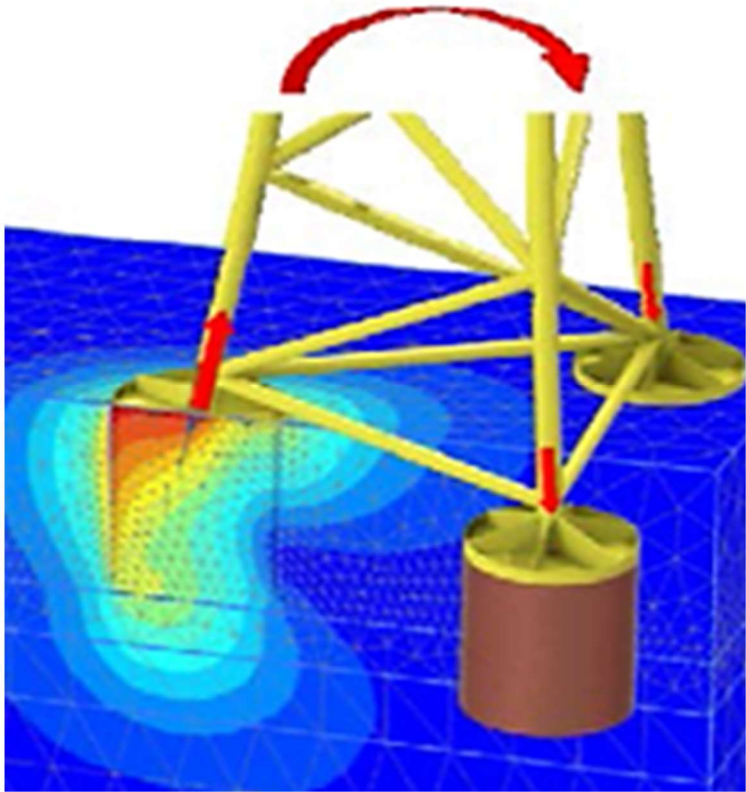
Cyclic soil response is a function of both the cyclic and average shear.

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



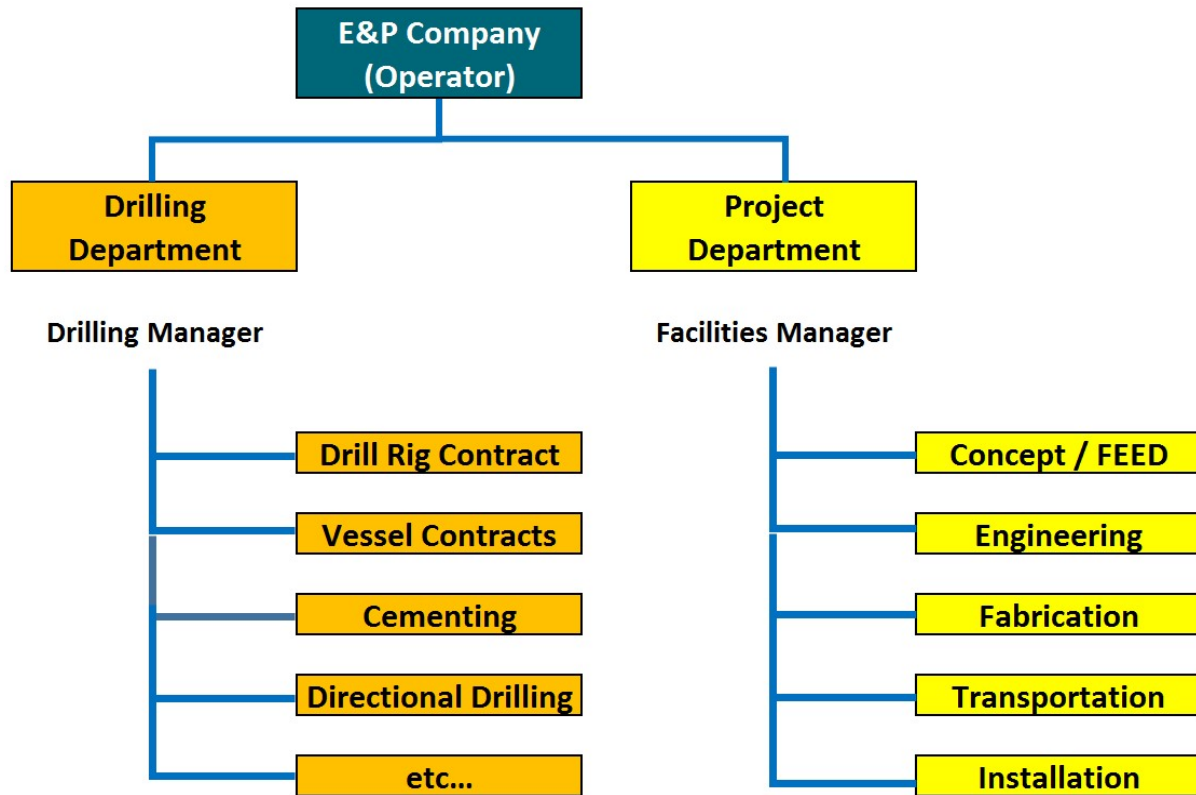
Value proposition: Rig installed

Major savings from:

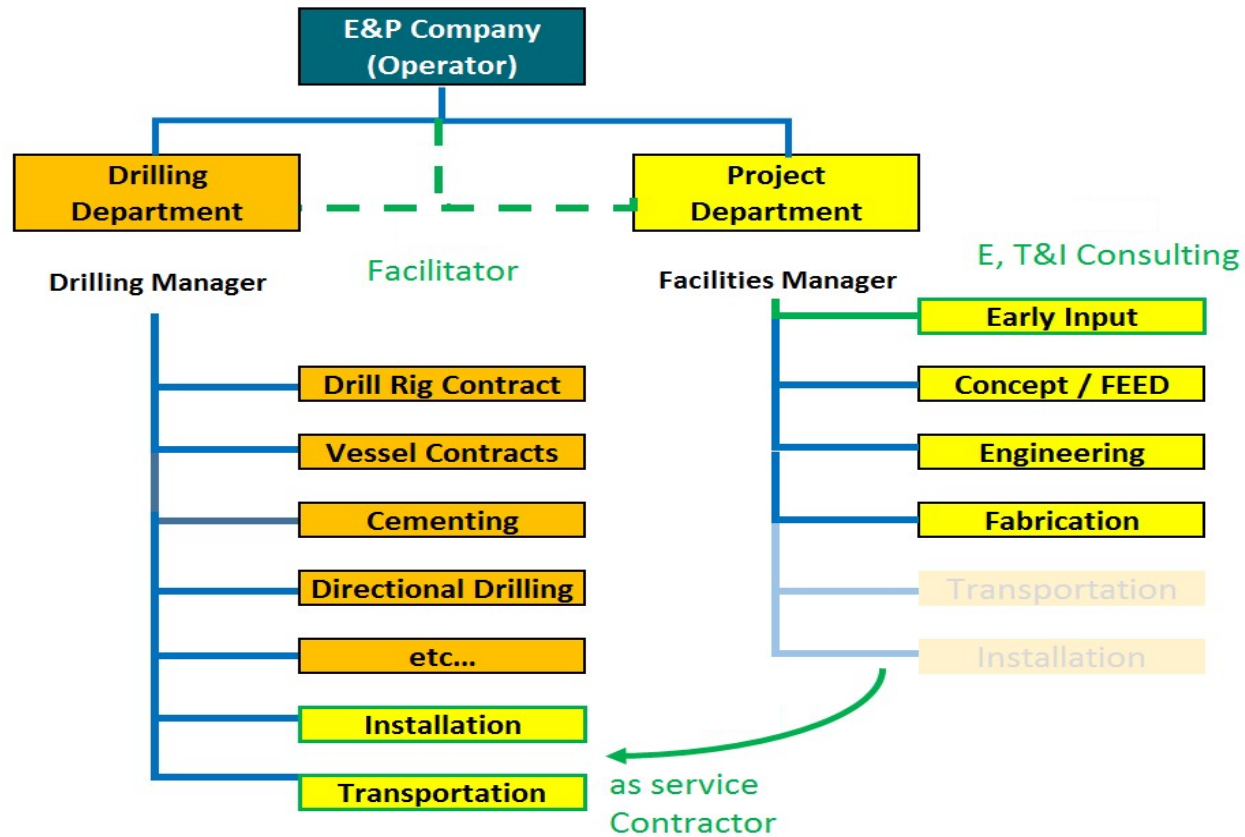
- ✓ < \$ Enables elimination of additional Derrick Barge.
- ✓ < \$ Enables selection of a wider range of less expensive pipeline or flowline installation options.
- ✓ < \$ Greater control of schedule & risk.
- ✓ < \$ Acceleration of First Oil date.
- ✓ < \$ If Suction Piled, Faster Install, Relocatable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



Typical Project Org Chart



Rig Installed Project Org Chart





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Summary/ Any questions

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

