



INTERVENTION &
STIMULATION ALLIANCE

Better resource utilization and increased oil recovery with the use of an Intervention rig

Maximize value of existing hubs/infrastructure

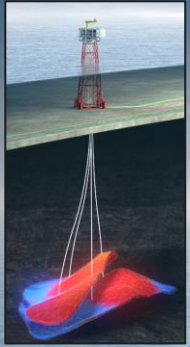
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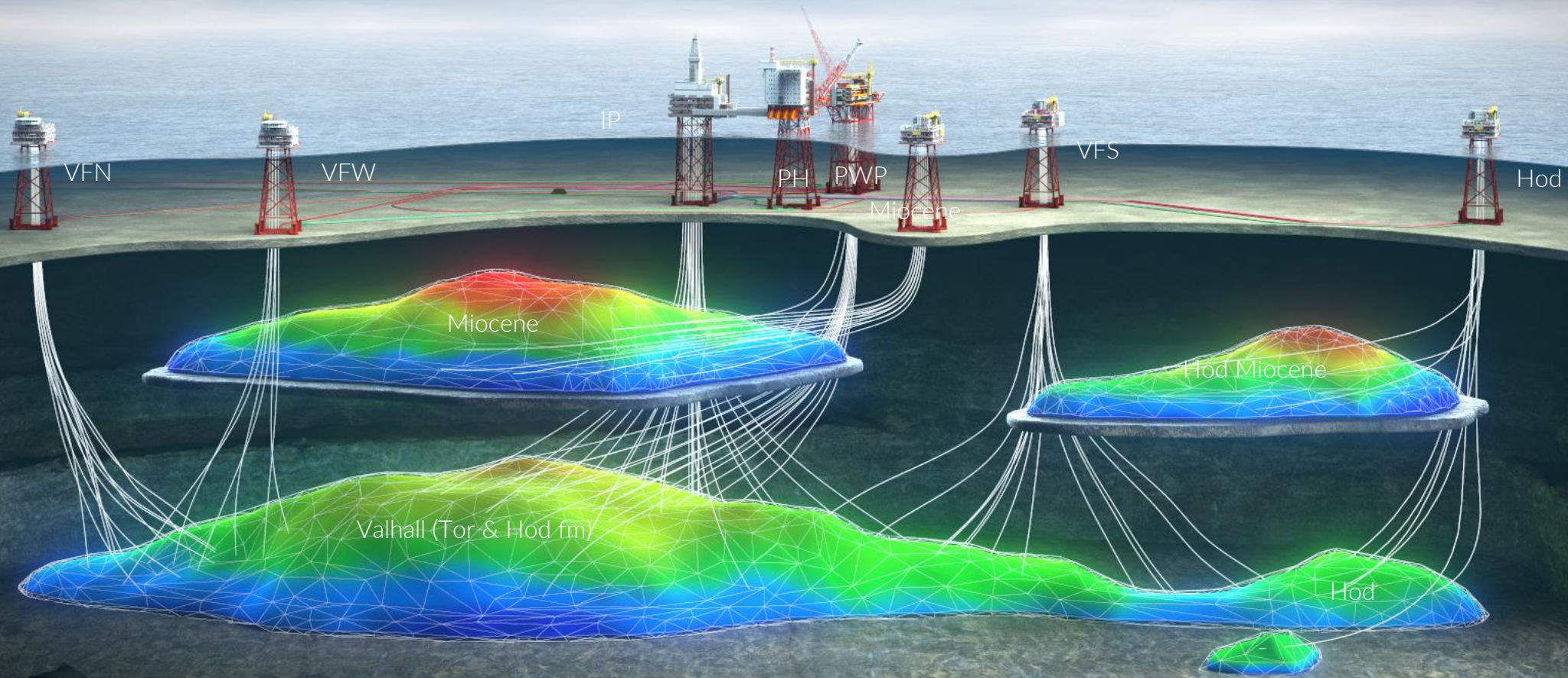
 **AkerBP**



Valhall – Ambition to recover 2bn barrels



- As of end 2021 Valhall/Hod has produced over 1.1 billion barrels of oil equivalents since production started in 1982.
- The ambition for the Valhall asset is to recover a total of 2 billion barrels of oil equivalents from the area and extend economic life to 2060 with zero emissions to the environment.






Maersk Reacher rig intake is a result from ongoing Multi Purpose Vessel (MPV) evaluation

Key differentiators

Challenges to consider

Assessment

	Key differentiators	Challenges to consider	Assessment
1-2 years	<p>1</p>  <p>The immediate need</p> <ul style="list-style-type: none"> - Large intervention backlog scope next 1-2 years - Possible to utilize tax window in 2021? - Maersk Reacher available from July 2021 	<ul style="list-style-type: none"> - Important to make sure that efficient use of the solution is well planned. - NUI & SWAT capacity - Maersk Reacher crane replacement 	Recommended to take in Maersk Reacher
2-5 years from now	<p>2</p>  <p>The medium-term challenge</p> <ul style="list-style-type: none"> - Limited defined scope at the moment. - Need for flotel for NCP (brownfield + greenfield). Cannot be used for intervention on NUIs, but NCP intervention relevant. - Tax window opportunity (link to NCP project)? - No flotel demand defined for regular 3-yearly TARs 	<ul style="list-style-type: none"> - Difficult to establish a solid business-case so far. - Maintenance scope to be further investigated. - Possible co-operation with Conoco Phillips? 	Needs to be assessed further to establish business case.
5-20 years from now	<p>3</p>  <p>The long-term transformation</p> <ul style="list-style-type: none"> - Needs to be seen in relation to how Valhall shall be operated in the future. - NOA may add additional scope to a MPV or a W2W-solution 	<ul style="list-style-type: none"> - How will we operate Valhall in the future? Will shuttling be replaced by MPV or W2W? - Co-operation with other assets. 	Needs to be assessed in relation to new operating model.

Sprint conducted in Dec/Jan confirmed a business case for the immediate need and use of Maersk Reacher. Additional work needed on medium- and long-term perspectives.

Significant efficiency gains by using rig

Strategic rationale

The design basis for Valhall NUI's are **700 mhrs** of interventions supported by SWAT and shuttling

Current intervention Valhall scope 2021-2023 is **200.000 mhrs** on the NUI's.

Shuttling efficiency is as low as 4.4 mhrs/day pr person

Experience from VFW 2020 shows 200 operation days out of 430 days total, due to waiting on others, weather, shuttling and RU/RD. **This indicates 100% efficiency gain removing shuttling and using a jack-up**

Seasonal efficiency gain of 30% (summer) and 50% (winter). Rigging between wells is reduced from 8 to 2 days

A NUI reference case states that a “walk-to-work” solution is economical at 5000 mhrs compared to shuttling

Shuttle and SWAT cost for VFW operations in 2020 allocated to interventions, was 1 M\$

HSSEQ Improvement. More space to rig-up and store equipment. Less trip hazards on deck. Ability to use rig equipment and

Robust solution to handle downhole challenges and unplanned activities

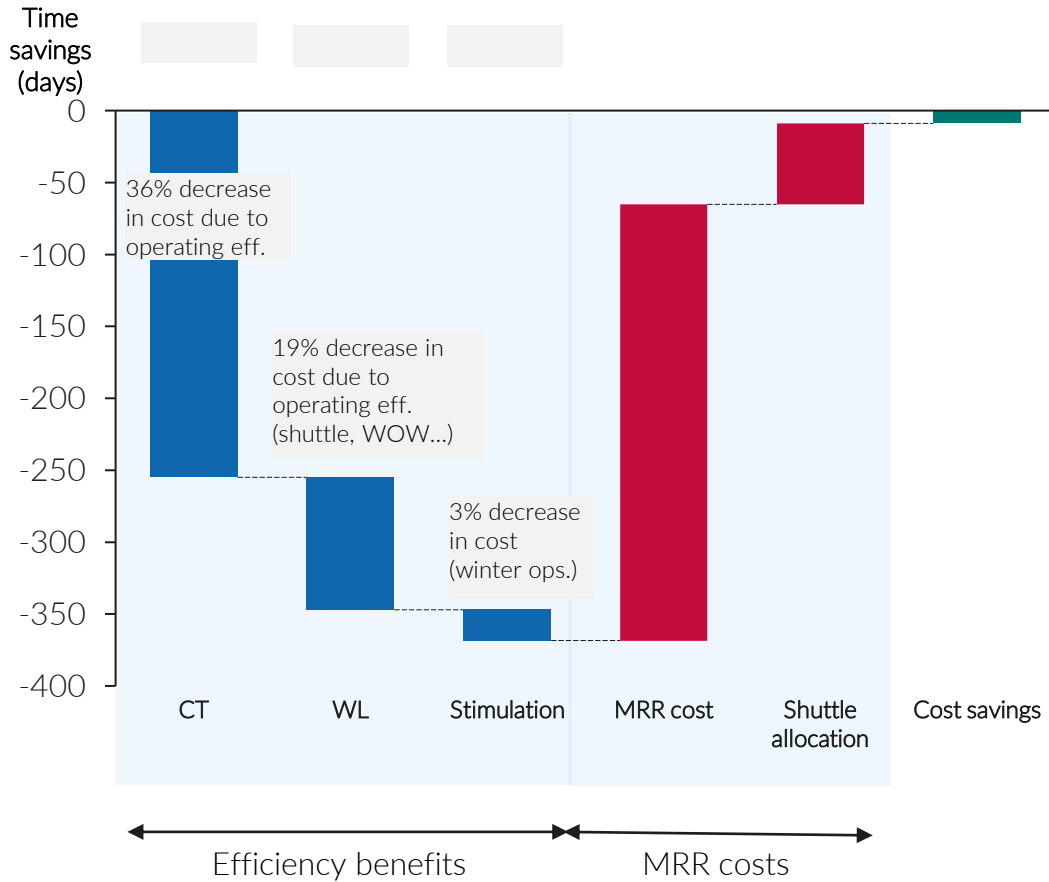
Accelerated production from running two intervention operations in simultaneously using the rig.



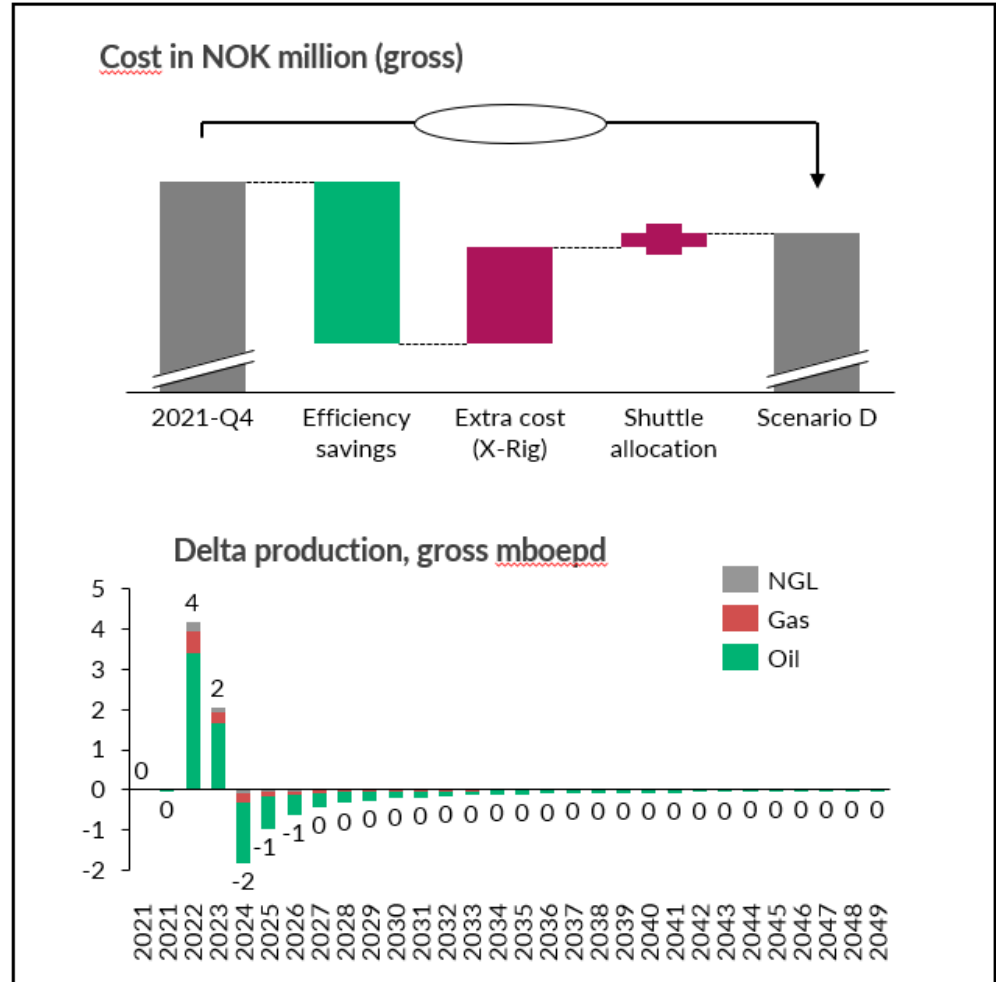
RIG INTAKE

Value drivers – Cost efficiency and early production

Cost efficiency (NOKm gross) – Mærsk Reacher

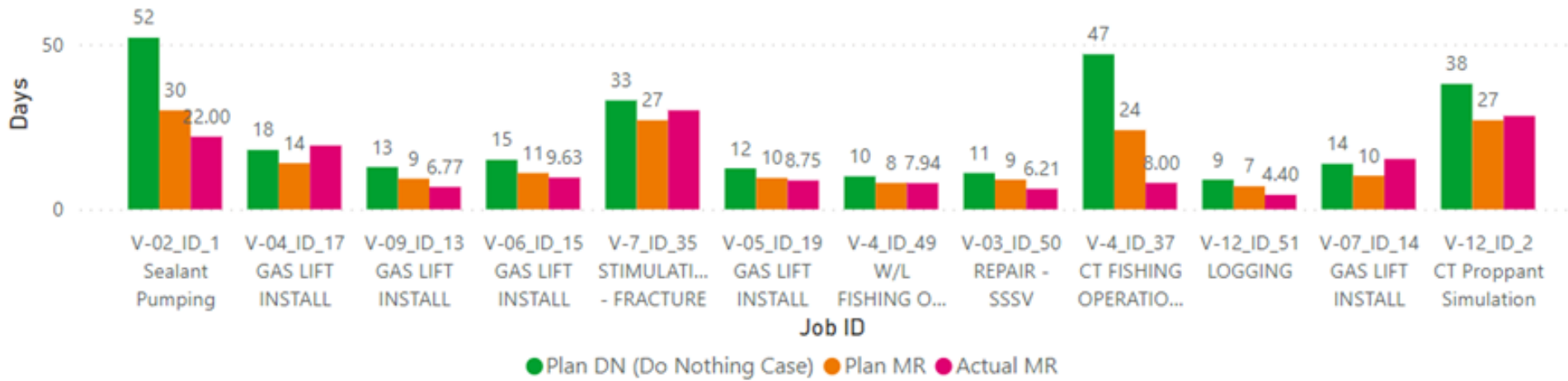


Cost efficiency (NOKm gross) – Mærsk Integrator

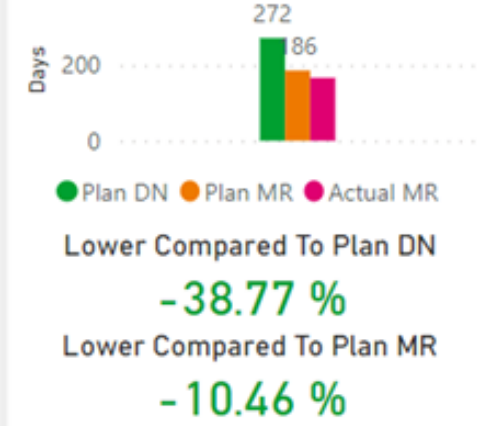




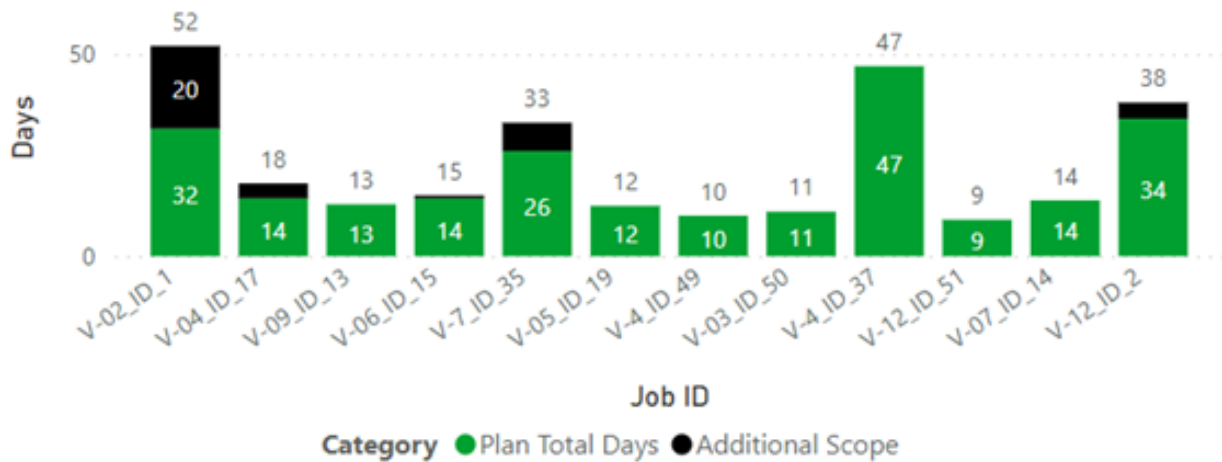
Plan Total Days vs Actual Total Days



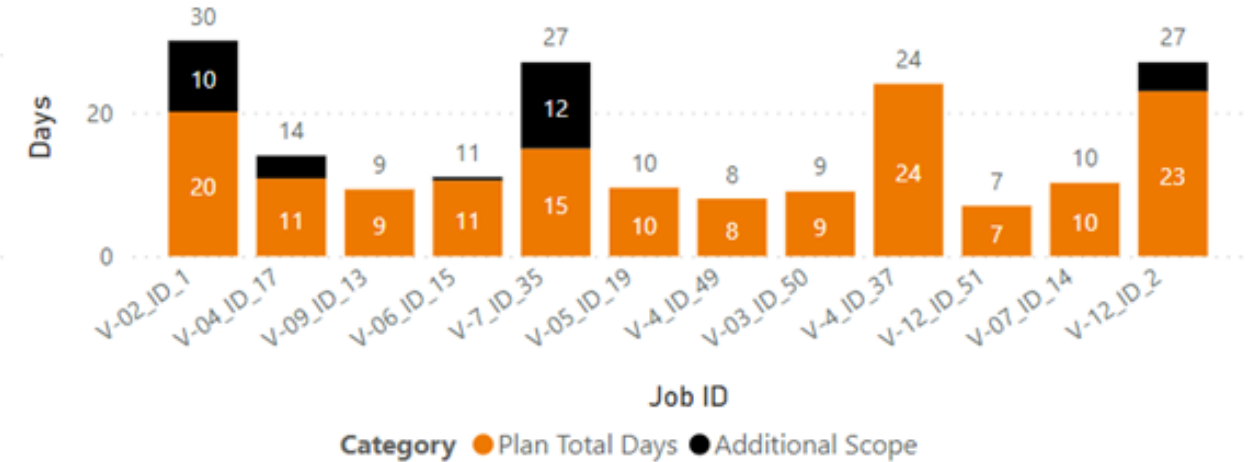
Completed Scope



Plan DN (Do Nothing Case)



Plan MR



Replace Mærsk Reacher with XLE rig (MING)

Opportunity

Secure XLE rigs for Jack-up alliance.

Facilitates early production from Hod B.

Facilitates SIMOPS on HOD operations.

Increased performance of Hod A pre-P&A scope potentially saving 5 m\$.

Increased robustness in schedule, allowing flexibility to handle unforeseen challenges, saving 15 m\$ compared to shuttling (10 months operation)

MR performance data indicates better results than business case.

Increased flexibility and reduced risk of postponing fabric maintenance (MODS) by increasing total POB on Valhall (~30/100 extra beds available).

Limited knock-on effects for Operations/PRO (Schedule changes).

HSSEQ Improvement. Additional space to rig-up and store equipment. Less trip hazards on deck. Ability to use rig equipment and tanks.



Lessons learned and ambition

Intervention rig on Valhall from August 2021- August 2023:

Best HSEQ McKenzie results on Valhall in 2021

By allocating rig cost to all intervention jobs, we see an increase for small OPEX jobs and a reduction for CAPEX jobs (stim). By having simultaneous operations, the efficiency increase pays for the rig

Increased robustness to handle unforeseen activities

Less locked in production and earlier production start dates

2-5 years from now

2

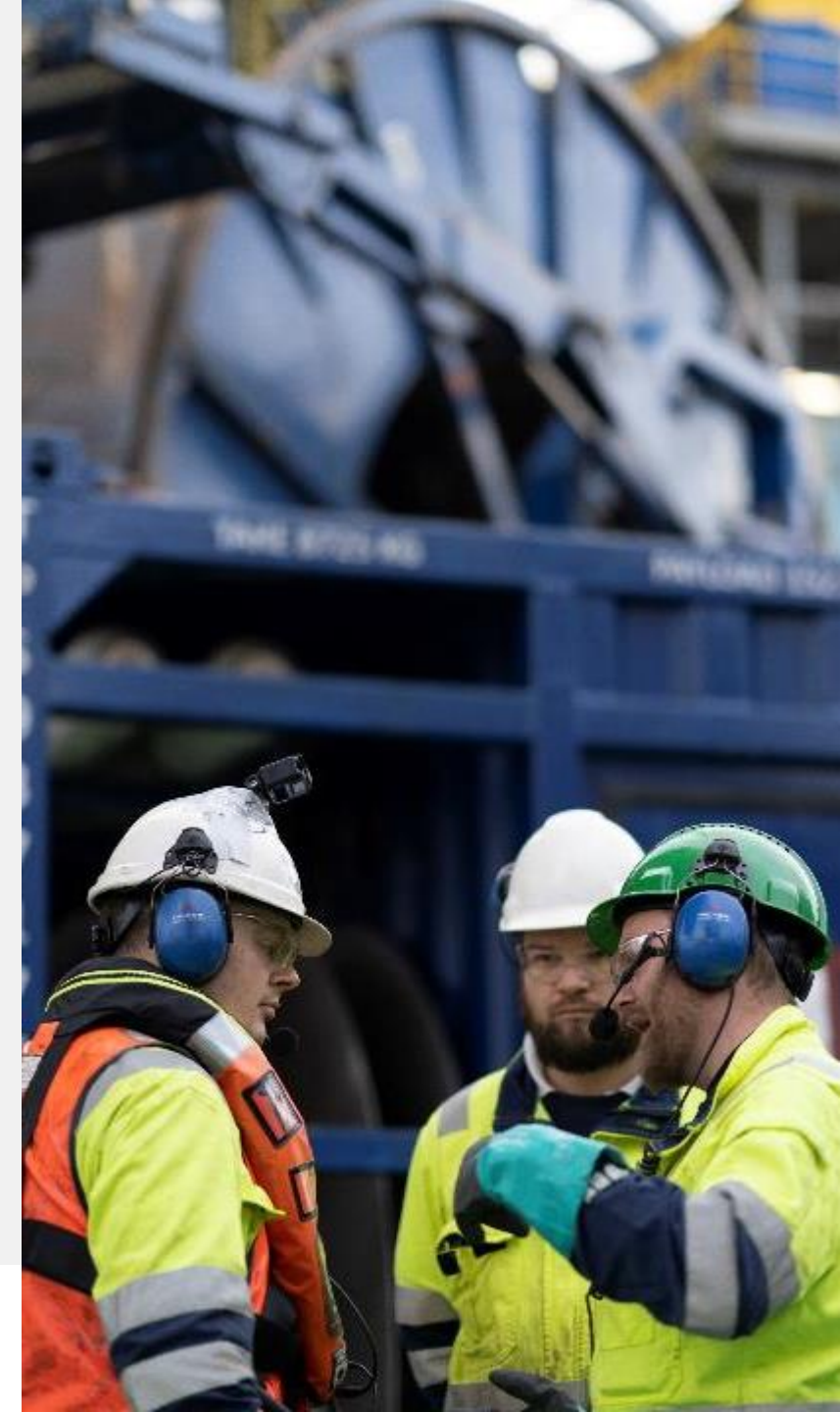


The medium-term challenge

- Limited defined future scope.
- Limited availability of small jack-up's and MPV's
- Flotel needed for NCP (brownfield + greenfield). Cannot be used for intervention on NUJs, but NCP intervention relevant.

- Difficult to establish a solid business-case so far.
- Maintenance scope to be further investigated.
- Possible co-operation with Conoco Phillips/Offshore wind

Project started to establish business case.





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