OUR VISION

THE PRIMARY CHOICE FOR THE GLOBAL MODULAR RIG SERVICES MARKET
REALISING OUR VISION

Initially focused in the North Sea, we provide services to the P&A, Well Intervention and Drilling markets, which include:

• Innovative modular rigs with low POB
• Well engineering studies
• Project management & collaboration
• Engineering & technical support
• Crewing solutions
OPERATORS REQUIREMENTS

A cost-effective solution to conduct plug and abandonment activities on 22 wells with:

- lightweight equipment
- small footprint
- compliance to temporary equipment standards
- documentation and build to operate on the Norwegian Continental Shelf
OPERATORS REQUIREMENTS

Modular Rig
- Low day rate
- Low/moderate platform interfacing
- Low POB

P&A Unit
- Low day rate
- Minimum platform interfacing
- Low POB

Optimus
- Lowest day rate
- Smallest unit (footprint/weight)
- Minimum platform interfacing
- Low POB

✓ Appropriately equipped, purpose-built P&A units entering the North Sea market
  - Concept similar to those used in mature P&A markets (GOM)
  - Low day rate
  - Existing rig removal minimized
  - Lower POB
DELIVERY

• Compact, light weight, configurable
• Top Drive – 60,000 ft-lbs torque
• Footprint – 11.7mx 11.7m (38ft x 38 ft)
• Nominal Hook Load – 225 Te (250 short ton)
• Maximum Hook Load (stuck pipe) – 300 Te (350 short ton)
• Automated Pipe / tubing handling – 2-7/8” to 20” (drill pipe/ casing range)
• Conductor pulling (boring and pinning, diamond wire cutting): 16in to 30in diameter range

Certification:
DNVGL-OS-E101 drilling plant
NORSOK compliant
NORSOK Z-015 temp. equipment

Drilling & Side-tracking ✓
Work Over ✓
Well Intervention ✓
P&A (Reservoir Isolation) ✓
P&A (Conductor Removal) ✓
CURRENT DEPLOYMENT

Jotun B platform

Optimus unit
OFFSHORE MOBILISATION
OFFSHORE MOBILISATION
OFFSHORE MOBILISATION
LESSONS LEARNT

Details lesson learnt following deployment and operations of the cost-effective solution
PULLING TUBING
PIPE TRIPPING
SHALLOW MILLING
# Lessons Learned

<table>
<thead>
<tr>
<th>Area</th>
<th>Opportunity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commissioning</td>
<td>11 months from contract award to commissioned offshore.</td>
<td>+</td>
</tr>
<tr>
<td>Connectivity</td>
<td>No internet access from shore to the unit reduced effectiveness of diagnostics and troubleshooting.</td>
<td>-</td>
</tr>
<tr>
<td>Lifting Operations</td>
<td>Wherever possible have module 2.7-3 lifts. Adjust lifts to crane capacities.</td>
<td>+</td>
</tr>
<tr>
<td>Mobilisation</td>
<td>Have enough vessel capacity available.</td>
<td>+</td>
</tr>
<tr>
<td>NORSOK Z-015</td>
<td>Encourage adoption of Z-015 temporary equipment standards removing the requirement for changing safety cases</td>
<td>+</td>
</tr>
<tr>
<td>Permit Issues</td>
<td>Evaluate methodology for permits in relation to shifting from a production regime to a rig up regime, reducing delays.</td>
<td>+</td>
</tr>
<tr>
<td>Shallow milling</td>
<td>Always have parameters available to increase performance, WOB, cutting fluids, etc.</td>
<td>+</td>
</tr>
<tr>
<td>PS-30 Power Slips</td>
<td>Always utilise this option where possible, good field proven design</td>
<td>+</td>
</tr>
</tbody>
</table>
HSE PERFORMANCE DURING PROJECT

ZERO injuries!
ZERO lost time incidents!
ZERO medical treatment cases!
ZERO spills!

- Safety by design
- Automation – removing people from operational danger zones
- Effective RED ZONE management philosophy
- Regular DROPS inspections
- Effective planned maintenance
- Effective investigations and reviews
- Proactive crew attitude
- Driven to improve
PERFORMANCE STATISTICS

Rig Skidding (Jotun B Current Statistics)

- 6-8 hours for permits, pre-job meetings, preparation work.
- 2.5 m between each slot in either direction, and c. 20 minutes / 70cm required to skid.
- Time dependant on slots jumped to new location (~ 1.2 hours per slot).
- 3-4 hours for refitting walks, handrails, removal of barriers etc. once skidding completes
TUBULAR PULL & LAYOUT PERFORMANCE STATISTICS

Average Meters/ Hour

Average Joints/ Hour

- B-25
- B-28
- B-21
- B-08
- B-17
- B-15
- B-11
- B-02
- B-01
- B-20
- B-29
- B-04

Average m/hrs

Average Joint/hrs
THE FUTURE

Do not wait for the asset to reach COP before start planning P&A and removal
CONDITIONS TO OPERATE

For smaller drilling contractors operating modular drilling packages, the market will need to provide long term framework contracts.

This will increase innovation and performance over time
THE FUTURE FOR P&A OPERATIONS IN THE NORTH SEA BASIN

Operators need to establish a process for targets to drill on mature assets.

*This will give incentives to start planning and execution of P&A long before COP*
## MODULAR EFFICIENCY SAVINGS (20 WELL PLATFORM)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Cost with P&amp;As</th>
<th>Cost with PWS Modular Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Modular unit – P&amp;A with Sim Ops</td>
<td>£103,200,000</td>
<td>£114,300,000</td>
</tr>
<tr>
<td>Single Modular unit – P&amp;A</td>
<td>£147,750,000</td>
<td>£69,750,000</td>
</tr>
<tr>
<td>Refurbished Derrick for P&amp;A</td>
<td>£217,500,000</td>
<td></td>
</tr>
</tbody>
</table>

- **Reinstated derrick ABEX**
- **Savings achievable using PWS modular solution**
INNOVATION IS ALSO METHODOLOGY, NOT ONLY TECHNOLOGY

BJØRN BJERKE
CEO
WWW.PWS-GLOBAL.COM