Technology Alone is Not Enough

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Proserv

Technology Transfers

@oilandgasuk
#OGConf16
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Senior Technical Authority
As Jobs once said “Technology Alone Is Not Enough”
Who We Are

Proserv is an international energy services company specialising in the provision of life-of-field solutions.

Technology has been the bedrock of Proserv's business for more than 50 years. Our Ingenious Simplicity ethos is embedded into everything we do, from the way we approach our design & engineering right through to how we implement our internal work processes and support the delivery of global projects.

Business Divisions:
- Drilling Control Systems
- Production Equipment Systems
- Subsea Systems & Services
## North Sea Track Record

<table>
<thead>
<tr>
<th>Year</th>
<th>Operator</th>
<th>Depth</th>
<th>Workscope</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>Maersk</td>
<td>119m</td>
<td>8 Wells</td>
<td>North Sea</td>
</tr>
<tr>
<td>2015</td>
<td>Shell</td>
<td>290m</td>
<td>1 Well</td>
<td>North Sea</td>
</tr>
<tr>
<td>2015</td>
<td>BG</td>
<td>120m</td>
<td>1 Well</td>
<td>North Sea</td>
</tr>
<tr>
<td>2015</td>
<td>Talisman</td>
<td>150-170m</td>
<td>3 Wells</td>
<td>North Sea</td>
</tr>
<tr>
<td>2015</td>
<td>Shell</td>
<td>95m</td>
<td>1 Well</td>
<td>North Sea</td>
</tr>
<tr>
<td>2015</td>
<td>Centrica/Antrim</td>
<td>87-126m</td>
<td>10 Wells</td>
<td>North Sea</td>
</tr>
<tr>
<td>2014</td>
<td>Talisman</td>
<td>144.8m</td>
<td>3 Wells</td>
<td>North Sea</td>
</tr>
</tbody>
</table>
Market Entry, GoM - UKCS

2009 – Derrick Barges
- GoM Market Entry

2010 - Platforms
- Added 1 complete spread every year since 2010

2014 - LWI/MSV Vessels
- UK Market Entry
- First Subsea Well Severance

2016 – Drilling Rigs
- 8 Subsea wells cut and recovered from a MODU
- Operate 6 dedicated spreads of well severance equipment globally
UK Market

Wells to be decommissioned in UKCS (2014-2022)*

- Platform Wells: 552
- Subsea Wells: 258

Wells must be **permanently abandoned**, by setting the required barriers (plugs), severing all casings and conductor 10ft below mudline, then recovering the wellhead to surface for disposal.

Estimated 18% of total North Sea wells require permanent abandonment in the next decade – already around 800 wells scheduled for P&A in next 5 years.*

Oil & Gas Operators mandated to **fully abandon wells** which have come to the end of their production life-cycle.

*Source: Oil and Gas UK, 2014
Knowledge Transfer

The Multi-String Cutting (MSC) tool is a down-hole tool that uses water abrasive jetting technology to sever through multi-string wells from 7” to 20” inner casing out to 36” OD.

Experience
The operating methodology, technology and offshore execution has been developed from over 20 years of water abrasive cutting experience to offer a reliable well severance service.

Service
The MSC Tool and associated equipment is used to sever platform or subsea wells internally below the mud-line.
The Proserv Multi-string Well Severance & Recovery solution severs the well 10ft below mud-line (BML).

Combined with the wellhead recovery solution (WHR) recovers the wellhead to surface post severance.

Completes this final phase of the well abandonment process in a single trip.

Originally Intended for rigless abandonment of Cat 1 and Cat 2 wells.

Offers an alternative to conventional mechanical cutting tools.

Reduces severance time and risk of getting stuck in hole.

Versatile tooling approach, plan and prepare for the unexpected.

Field proven to 290msw (1000ftsw).

Environmentally, a better option than explosive well severance.
Engineered based on our *ingenious simplicity* philosophy
How it Works
Single Trip Severance & Recovery

- Deployed in conjunction with the MSC tool
- Modular design to allow single trip or multi-trip operation
- Latches onto 18 ¾” H4 and Camhub profile wellheads to secure MSC tool in well
- 100 tonne pulling capacity for wellhead recovery to deck
What has been achieved with the technology?

Severed and recovered over **130 surface wells** from below mudline in the US Gulf of Mexico since 2009

Severed and recovered **27 subsea wells** in the North Sea utilising the well severance solution since 2014

Rigless to rigs in 2016 - completed **8 North Sea single trip** subsea well severance and recoveries in 9 days running off drill-string from a MODU
Benefits of the Technology

Greater Capability
- **Standardised** solution
- Technology now covers a full range of well applications and deployment methodologies
- We are a service company with technology
- We retain the experience and knowledge through our onshore and offshore personnel that drives our technology

Cost, Time and Risk Reduction
- Reduces operational time by reducing number of trips in well
- Superior cutting time of typically 4-6 hours for a 4 string, un-cemented well
- Wellhead can be cut and recovered in a single trip
- Increased confidence and lower risk through reliability and repeatability
- Early engagement with the Operator to reduce risk

Changing Mind-sets
- Used on over 130 Wells – reliably, safely and successfully
- Seen as high risk to early adopters
- Witnessed the race to be last
- There is a reluctance to change, accept and adopt new technology
- Focus is on the spread day rate and not operational time reduction
Operator Collaboration

Operator A (4 wells)  Operator B (2 wells)  Operator C (6 wells)

Batching Campaign

Proserv Well Severance Campaign

1. Reduce mobilisation cost
2. Single trip ethos
3. Continuity
4. Flexibility across all well applications

Cost, time and risk reduction
Closing Thoughts

Continue to innovate, challenge convention and push the change in industry mind-set

Continue to harness and advance capabilities to help ensure the industry’s future
Questions?

“Simple can be harder than complex: You have to work hard to get your thinking clean to make it simple. But it's worth it in the end because once you get there, you can move mountains.”

Steve Jobs

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