Next-Gen Multilateral Completions

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ADL is focused on cost effective multilateral completions for enhanced sidetrack and new well applications.

Team with experience of multilateral completion projects for Exxon, Woodside, Saudi Aramco, KOC, Lukoil (Caspian Sea).

The only MLT system for mass market: unique design allows radical cost reduction – breaking mindset for global adoption of ML’s

200+ multilateral completion and casing exit systems deployed with 100% success rate.
PROBLEM:
- Conventional sidetrack requires mainbore abandonment → 8000+ wells are abandoned annually
- **11M tones (~$3b) are lost every year**

SOLUTION
- At 10% cost of conventional sidetrack operator keeps production (10-100 bbls/day) from existing mainbore
- No need to wait mainbore to deplete to sidetrack

* Calculations performed to compare conventional sidetrack with TAML 3 dual lateral well
Cost effective MLs for new wells

$1m+ per well savings

2x reduction of pad construction, drilling, casing and cementing top sections etc.

Time savings, intervention equipment not required

* Calculations performed to compare 2 x horizontal MSF wells with TAML 3 dual lateral well
<table>
<thead>
<tr>
<th>Anchor technology</th>
<th>ADL COMPLETIONS</th>
<th>HALLIBURTON</th>
<th>Schlumberger</th>
<th>Baker Hughes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 trip expandable retrievable anchor</td>
<td>1 trip permanent packer</td>
<td>2 trip permanent packer</td>
<td>2 trip permanent packer</td>
<td></td>
</tr>
<tr>
<td># of trips to complete the well</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Intervention tools required?</td>
<td>No</td>
<td>Yes- $$$</td>
<td>Yes- $$$</td>
<td>Yes- $$$</td>
</tr>
<tr>
<td>MWD required?</td>
<td>No</td>
<td>Yes- $$$</td>
<td>Yes- $$$</td>
<td>Yes- $$$</td>
</tr>
<tr>
<td>Cost*</td>
<td>150k$</td>
<td>1000k$+</td>
<td>500k$</td>
<td>400k$</td>
</tr>
</tbody>
</table>

*Comparison performed for TAML 3 dual lateral well
Unique technical features

3 unique features making ADL simple, robust and affordable for mass market

Anchor assembly
- Unique expandable design
- High hanging capacity - can be used as liner hanger
- Big ID - no restrictions for intervention operations
- One trip system

Orientation profile
Bore-thru whipstock
- Bore-thru design - no need to retrieve whipstock after milling operations
- Design gives ability to use whipstock as deflector for intervention operations - no additional equipment required
- One trip system

Anchor profile
Standalone orienting sub
- Unique design - no MWD required to obtain anchor orientation
- Simple and robust design
- Data can be offloaded directly from device after job on the rigsite
- One trip system

Job to be prepared & ran by 2 men crew using existing customers facilities
Our team

Alex Kashlev
BD director, Co-founder
- 11+ years in completions business (HES, BOT, Smith and SLB)
- From field engineer to MLT segment leader
- TAML 5 for Exxon at Sakhalin
- TAML 5 with intelligent completions at Caspian offshore
- TAML 5 for Woodside
- TAML 2 for KOC Kuwait
- TAML 1-4 for Saudi Aramco

Ivan Mnatsakanov
Co-founder
- 14+ years experience in major service companies (HES, BOT, Smith and SLB)
- Operations manager for completions department of SLB Canada (70 people team)
- 10+ MLT projects in Yemen, Saudi Aramco, KOC, Russia

Andrew Fedotov
Project manager
- 8+ years at major service companies (Smith, SLB)
- 1st worldwide TAML 5 installation for Novatek LNG well in 7” casing
- TAML 1-3 projects for major O&G companies at Russia land

Alex Philippov
Operations team leader
- 9+ years experience at SLB as field team leader
- TAML 5 for Exxon at Sakhalin
- TAML 5 with intelligent completions for Lukoil at Caspian offshore,
- TAML 5 for Woodside energy Australia
Global Team Experience
Project highlights:

• Customer identified need to complete 6 wells as TAML-4 w/ stage cemented liner

• 9 5/8" 47ppf P110 casing

• Average TVD 1500+m; Average MD 3000m+

• Team members ran the project from preparing well design on paper to workshop preparation and field execution phase in tight collaboration with Saudi Aramco team

• During project all procedures and quality process were improved via best practices management process

• 6 wells completed with no NPT and HSE incidents.
Challenge:
• Well completed as TAML-2 by different supplier in 2015.

• Whipstock retrieved with anchor.

• Urgent need in lateral acidizing identified by customer in early 2017 - window placement data lost, NO ANCHOR IN THE WELL MEANS NO INTERVENTION ABILITY

ADL Completions solution:
• Added spring loaded window finder to std whipstock design and manufactured tools in less than 2 weeks timeframe

• Window located and whipstock set in one trip

• Window reamed and lateral access confirmed in 12hrs

• Lateral acidized successfully

• Based on customers requirements whipstock retrieved with anchor in 2 trips. Based on performance Zarubezhneft provided recommendation letter to ADL Completions
**Project highlights:**

- Customer identified need to complete well as TAML-2 w/ drop off liner in the lateral
- 7” 29ppf P110 casing
- TVD 2000m+; MD 3000m+
- Team members ran the project from preparing well design on paper to workshop preparation and field execution phase
- During workshop preparation phase team members improved procedures and quality process via best practices management process

- **Well completed as planned with no NPT and HSE incidents**
Annexes - ADL Products Portfolio

ADL Completions
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**Technology description:**
Lateral gets sidetracked in open hole from bore-thru whipstock which stays in the well permanently.

**Applicability:**
- Hard carbonate formations where sidetrack can be performed only from cement plug
- Fishbone open hole multilateral completion applications

**System highlights**
- TAML-1
- 3 runs in the hole to create multilateral well
- Sidetrack with mills
- High accuracy of whipstock orientation- unique orienting device design
- High speed of orientation- rig time savings
- Possibility to retrieve whipstock
- Large bore thru whipstock- 3.6” in 6” open hole
Technology description:
Cased hole sidetrack from bore thru whipstock gives opportunity to complete multilateral wells keeping ability to intervene to both mainbore and lateral without any additional intervention equipment installation thru ought well life.

Applicability:
Hard stable formations is main area of applicability- no mechanical integrity between mainbore and lateral required thru ought well life.

System highlights
• TAML-2
• 3 runs in the hole to create multilateral well
• Intervention in both mainbore and lateral doesn’t require any additional equipment installation
• High accuracy of whipstock orientation- unique orienting device design
• High speed of orientation- rig time savings
• Possibility to retrieve whipstock
• Large bore thru whipstock- 3.6” in 7” casing
• Applicable on new wells or old fund of wells keeping production from existing mainbore: mainbore casing sizes from 5 3/4” up to 9 5/8”
**Technology description:**
Open hole sidetrack from bore thru whistock with further on junction installation gives opportunity to complete fishbone type of wells in hard carbonate formations with mechanical integrity between mainbore and lateral liner; keeping ability to intervene to both mainbore and lateral without any additional intervention equipment installation thru ought well life.

**Applicability:**
- Hard stable carbonate formations
- Un-stable carbonate formations

**System highlights**
- TAML-3
- 3 runs in the hole to create multilateral well
- Intervention in both mainbore and lateral doesn’t require any additional equipment installation
- High accuracy of whipstock orientation- unique orienting device design
- High speed of orientation- rig time savings
- Possibility to retrieve whipstock
- Unique solution for the market- no analogues exist
Technology description:
Open hole sidetrack from bore thru whistock with further on junction installation gives opportunity to complete fishbone type of wells in hard carbonate formations with mechanical integrity between mainbore and lateral liner; keeping ability to intervene to both mainbore and lateral without any additional intervention equipment installation thru ought well life.

Applicability:
- Hard stable carbonate formations
- Un-stable carbonate formations

System highlights
- TAML-3
- 3 runs in the hole to create multilateral well
- Intervention in both mainbore and lateral doesn’t require any additional equipment installation
- High accuracy of whipstock orientation- unique orienting device design
- High speed of orientation- rig time savings
- Possibility to retrieve whipstock
- Applicable on new wells or old fund of wells keeping production from existing mainbore: mainbore casing sizes from 5 3/4” up to 9 5/8”
**Technology description:**
Cased hole sidetrack from bore thru whipstock with further on junction installation and lateral liner cementing gives opportunity to complete multilateral wells with mechanical integrity between mainbore and lateral liner avoiding sand/ water break thru at the window area; keeping ability to intervene to both mainbore and lateral without any additional intervention equipment installation thru ought well life.

**Applicability:**
- Un-stable formations
- Water/ sand producing zones at the casing exit area

**System highlights**
- TAML-4
- 5 runs in the hole to create multilateral well
- Water/ sand production shut off at the window area by means of cementing lateral liner
- Intervention in both mainbore and lateral doesn’t require any additional equipment installation
- High accuracy of whipstock orientation- unique orienting device design
- High speed of orientation- rig time savings
- Possibility to retrieve whipstock
- **Applicable on new wells or old fund of wells keeping production from existing mainbore: mainbore casing sizes from 5 ¾” up to 9 5/8”**