Discovery MLT
Multilateral reentry system

APPLICATIONS
- Stimulation and cementing operations
- Well cleanouts using gelled or foamed fluids
- Cleanouts using formation jetting
- Operations involving wireline logging

ADVANTAGES
- Reentry to all levels of multilateral wells
- Economical alternative to traditional reentry techniques
- Confirmation of correct access with only one run to TD
- Fast job turnaround in one trip using standard CT equipment
- High success rate for reentry on a first attempt
- Easy detection of subsequent windows after locating first window
- Surface-controlled, flow-activated tool orientation
- Real-time display of toolface orientation relative to lateral entry
- Pressure variation telemetry
- Acid-resistant BHA
- Operability in subhydrostatic (depleted) wells
- Compatible with logging tools such as the RSTPro* reservoir saturation tool and logging tools

The acid-resistant system enables accurate execution of all types of fluid treatments and provides new options for cost-effective treatments of Level 1 and Level 2 laterals, which typically are not economical to access using traditional reentry techniques.

The Discovery MLT* multilateral reentry system sends a pressure signal to the surface to confirm access to the correct lateral. The ability to adjust the sub orientation, or bend, from surface and the real-time feedback to surface of window identification save time by increasing the probability of successful reentry on the first attempt. Confirmation requires only one run to the bottom of the main wellbore. Although the Discovery MLT system operates solely on pressure and flow, a logging cable can be used to enable the use of logging tools.

Positioned in the upper part of the Discovery MLT system BHA, the orienting tool delivers the torque required to index the lower part of the BHA. In addition to the standard 2 7/8-in OD tool sub, a 3 1/16-in OD orienting sub is available for high-friction wells with severe doglegs. Torque performance for both subs is independent of tool depth.

The bent sub angle is controlled by varying the surface pump rate. When the flow rate exceeds the adjustable threshold rate, the sub changes shape from straight to angled.

Job feasibility is determined by the CoilCADE* coiled tubing design and evaluation software. Real-time data is monitored and recorded though the CT unit sensor interface with CoilCAT* coiled tubing computer-aided treatment. Discovery MLT system enables displaying essential parameters such as tool orientation relative to the lateral window. The software also monitors previous indexes and guides the operator through indexing cycles, providing accurate, real-time information about the downhole environment. After the window is profiled, the software memorizes the window orientation and monitors the BHA orientation throughout the entire operation, facilitating the location of other windows.

Technology for selective lateral reentry on the first attempt.
Technical Specifications

- Toolstring length: 8.2 m [27 ft] (total BHA)
- Max. dogleg severity: 60°/30.5 m [100 ft]
- Max. temperature rating: 149 degC [300 degF]
- Max. differential pressure: 34.5 MPa [5,000 psi]
- Max. flow rate: 0.8 m³/min [5 bbl/min]
- Max. tensile load: 122.3 kN [27,500 lbf]
- Rotation coverage: 30° per pump cycle
- Flow during window profiling: Yes
- Fluid compatibility: H₂S resistant and chemically resistant to HCl, mud acid, aromatic solvents (toluene, xylene), EDTA, and nitrified fluids

Tool Specifications

<table>
<thead>
<tr>
<th>Tool</th>
<th>OD, in</th>
<th>Length, ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orienting tool (slim version)</td>
<td>2 1/8</td>
<td>7.0</td>
</tr>
<tr>
<td>Orienting tool (high-torque)</td>
<td>3 1/16</td>
<td>11.1</td>
</tr>
<tr>
<td>Controllable bent sub</td>
<td>2 1/8</td>
<td>11.3</td>
</tr>
<tr>
<td>Downhole filter</td>
<td>2 1/8</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Note: H₂S = hydrogen sulfide
HCl = hydrochloric acid
EDTA = ethylenediamine tetraacetic acid