InnerVue™ WellSuite Diagnostics Service

NON-INTRUSIVE WELLBORE FLOWPATH DIAGNOSTICS PROVIDES DECISIVE INSIGHT TO OPTIMIZE FLOW PERFORMANCE MANAGEMENT

OVERVIEW
The InnerVue™ WellSuite Diagnostics Service is a non-intrusive solution for wellbore analysis. The service can be used to detect top of cement or top of plug location, evaluate deposition on casing or tubing walls and locate any leaks in the casing, tubing or annular space. In case of a stuck tool in the well, InnerVue can non-intrusively provide a depth of top of tool for efficient fishing operation. The service requires pressure wave measurement equipment to be connected directly to the wellhead system for data collection. The data collected is analyzed using proprietary software to profile debris or deposition, to detect changes in internal diameter, or to locate leaks and blockages.

HOW IT WORKS
Halliburton’s advanced technology, employed in the InnerVue service, uses a pressure wave (or pulse) generated inside the casing, tubing or annulus, which travels at the speed of sound. This pulse returns a reflected wave that corresponds to any features detected in the pipe bore or annulus, including deposition of wax, scale, hydrate, leaks, or even a stuck tool, as well as the flow medium itself (density, viscosity, etc.). The pulse also reflects off top of cement or top of plug in P&A situations. A high accuracy transducer is utilized to measure pressure variations, signals from the transducer are logged at an ultra-high sampling rate. Once the data is collected, analyzed by the software and extrapolated into profiles, Halliburton's team of experts are available to help with diagnostic analysis and reporting to facilitate decision-making and remediation plans—without sacrificing production uptime or throughput.

APPLICATIONS
» Locate position of blockages and obstructions, such as stuck tools or top of cement/plug
» Assess thickness, volume and location of deposit in casing/tubing
» Locate and quantify leaks

FEATURES
» Operable in Zone II harsh environment
» Operating pressure up to 5800 psi (400 bar)
» Operating temperature range from up to 185°F (85°C)
» Ambient temperature range from 0 to 104°F (40°C)
» Sample rate 4,000 Hz
» Lithium-ion battery 65 Wh
» Compliant with IATA 2014 regulations for air freight
» Small equipment case, weight 33-lbs. (14 kg)

BENEFITS
» Non-intrusive
» Increase confidence before P&A operation
» Reduce the risks of stuck tools during wireline run
» Track the progress and effectiveness of chemical cleaning program
» Collect data rapidly, with minimal equipment and personnel
» Minimize or eliminate interruption of production

InnerVue™ WellSuite complete package of diagnostic equipment, including transit case, pressure transducers (with different ranges), data-logger, cables and charger (left) and data-logger (right).
ADVANTAGES

» Can be executed with only one site technician with minimal setup and operational impact
» High level of accuracy when locating top of cement, top of plug, and distance to blockage
» Can provide a roadmap of the internal diameter of the wellbore flowpath

Equipment Specifications: Package Including Transit Case

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Height</th>
<th>Weight</th>
<th>Content</th>
</tr>
</thead>
</table>
| 21-in. (54 cm)| 14-in. (36 cm) | 9-in. (22 cm) | 33-lbs. (14 kg) | 1 data-logger Zone II  
Set of pressure transducers (multiple range)  
Standard fittings for pressure transducers  
2 data communication cables  
1 battery charger  
Documents package (MSDS, certificates, data sheet, instructions manual) |

Data-logger Specifications

<table>
<thead>
<tr>
<th>Size</th>
<th>Weight</th>
<th>Power Supply</th>
<th>Controls</th>
<th>Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-in. x 9-in. x 5-in.</td>
<td>6-lbs.</td>
<td>Rechargeable lithium-ion battery for up to 10 hours of operation</td>
<td>6 piezo switches, including 1 illuminated on/off switch</td>
<td>4 input channels, 1 power supply input and 1 USB port</td>
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<tr>
<td>(20 cm x 22.5 cm x 11 cm)</td>
<td>(3 kg)</td>
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For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com/InnerVue

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