NOV's Drillstring Measurement System Enables Successful Retrieval of Stuck Tools on Test Rig

Technology

NOV's StringSense™ integrated drillstring measurement system provides a means of making surface measurements directly on the drillstring and using that data to develop a complete picture of the drilling process from downhole to surface. As a patented instrumented internal blowout preventer, the StringSense system delivers more accurate and dependable surface drilling data and allows you to extend the operating envelope when drilling near the technical limits of the well.

Performance

Our StringSense system was deployed on the rig for purposes of studying and analyzing the rig's operational performance during the various testing iterations conducted at the facility. The goal of this test run was to demonstrate the StringSense system's capabilities in a semi-controlled environment while developing lessons learned for future implementation. On this run, the rig was conducting operations with downhole tools when they got stuck, which lead to the use of jarring tools in a retrieval attempt.

Results

Several jar events occurred on the rig. There was a noticeable difference between the two sets of jar tooling used, which were from different manufacturers. The data obtained from the StringSense system confirms the drilling crew's belief that the second set of jars had a more substantial impact, as the crew could feel the ground shake. The StringSense system provided superior tool performance visualizations and a better understanding of which jar tool would work best in this scenario, enabling the client to optimize tool operation and successfully retrieve the stuck tools, with these results being repeatable in similar applications.

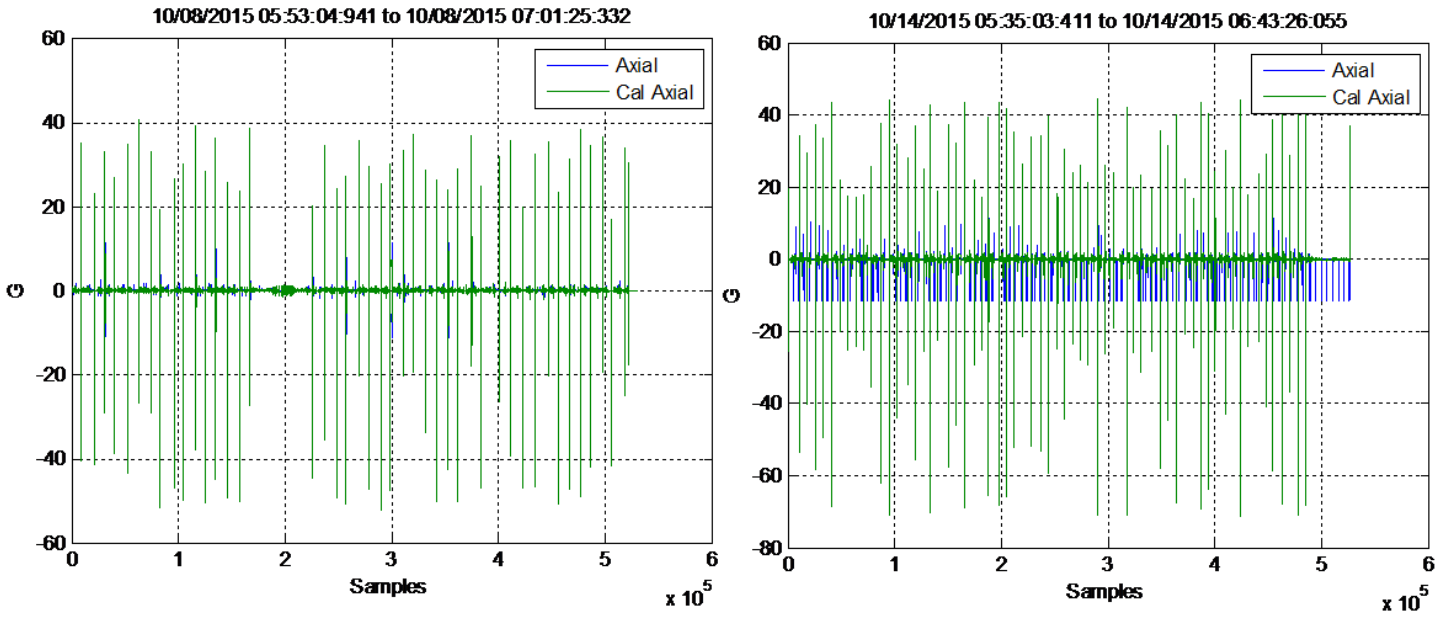

Figure 1 – The graph at left shows that the first manufacturer's jars experienced peak magnitudes of 5 to 10 G less than those of the other manufacturer's jars, demonstrating the StringSense system's ability to differentiate jarring operations from surface.

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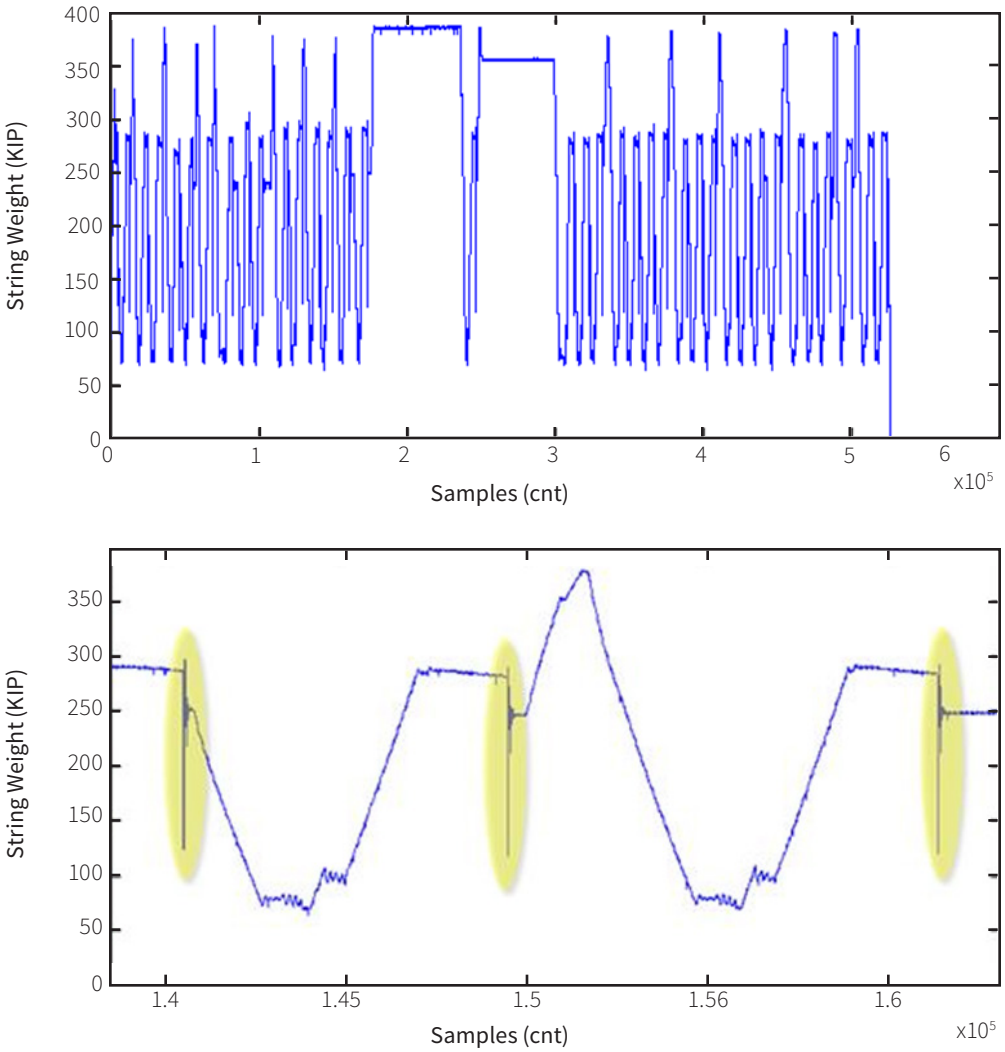

Figure 2 – The top graph shows that the topdrive was repeatedly pulling on the drillpipe, while the highlighted areas on the bottom graph show periodic jarring events.