Challenge:
In St. Mary Parish, Louisiana, where interbedded sand/shale stringers have a long history of causing damaging vibration, our customer’s exploration well was 18 days behind its AFE schedule when Sperry Drilling Services was challenged to provide an economical means of mitigating vibration while drilling the 14-3/4-inch hole section.

Solution:
To provide cost-effective vibration mitigation during drilling, Sperry recommended the ADT® optimization service using the DDS™ (drillstring dynamics sensor), DrilSaver™ and RT-WHIRL™ (real-time WHIRL) sensors, to be run in combination with the SlickBore® matched drilling system.

The DDS sensor measures downhole vibration in real time, making it possible to adjust drilling parameters when high vibration levels are detected and avoiding extended exposure to damaging vibration levels.

The DrilSaver sensor monitors surface parameters to provide a real-time display of the magnitude for torsional vibration in the drillstring, allowing the driller to quickly recognize and correct for damaging vibration by varying drilling parameters. The RT-WHIRL service allows for constant re-calculation of critical RPMs that propagate vibration through the BHA, enabling the driller to avoid those parameters that will induce whirl tendencies.

In this particular case, the 14-3/4-inch hole section was drilled using six BHAs, with each run requiring some vibration intervention by the ADT service personnel based on ADT service output. Early in the section, a conventional rotary BHA was run using an extended-gauge FullDrift® bit from Security DBS Drill Bits, but the BHA experienced damaging vibration with the bit and collars connections exhibiting galling when pulled. Based on the DrilSaver sensor output for the run, the recommendation was then made to change to the matched SlickBore BHA system, comprised of a Security DBS extended-gauge PDC drill bit specifically matched with a purpose-built performance motor. Combined with the full complement of ADT service vibration mitigation technology, this BHA proved most effective at minimizing vibration, which resulted in the entire 14-3/4-inch section being drilled 685 feet deeper than the next-best offset. In addition, the 10,938 feet drilled at a 34 percent faster ROP. Only five bits were required, compared to 16 bits used in the “best-in-field” offset.

Value Created:
Application of the SlickBore service drilling technology and ADT drilling optimization services, including real-time vibration monitoring, produced a step-change in drilling performance in this St. Mary’s Parish well. Of the first four runs in which Sperry technology was used, each successive run experienced less vibration, ultimately resulting in greater footage at a higher average ROP and with fewer bits and BHAs than the next-best offset. As a result, the 14-3/4-inch section, which started 18 days behind schedule, reached TD ahead of the AFE plan, producing an estimated savings to the customer of more than $830,000.

For more information, please contact sperry@halliburton.com