### Case History

**Well Construction**

**Halliburton Increases Hole Quality and Saves Time in the North Sea**

**Location:** North Sea

**Operator’s Challenge** – In the summer of 2007, a major operator in the North Sea had difficulties maintaining consistent hole quality using the typical drilling method, which involved running a positive displacement mud motor at a high bend setting. The operator wanted to avoid poor hole quality because of the problems with installing liners and the increased likelihood of casing failures.

**Halliburton’s Solution** – To maintain expected steering performance and rate of penetration while improving hole quality, Halliburton’s Sperry Drilling services team deployed a solution that combined the precision of the Geo-Pilot® rotary steerable system, the proven performance of Drill Bits and Services’ XR™ Reamer 1200 tool and the efficiency of the Evader® Gyro-While-Drilling service.

**Economic Value Created** – After the liner was in place and the cementing job complete, the operator was pleased with what they saw. The efficiencies and hole quality gained by using the Halliburton solution are expected to increase the life of the well. Immediate savings that can be linked directly to the advanced tools and technologies used on the rig include reduced operating time, decreased non-productive time and the elimination of any additional tripping time. In fact, the operator saved 12 to 15 hours of on-bottom drilling time.

When an operator had difficulties maintaining hole quality in an offshore well, they asked Halliburton’s Sperry Drilling to assess the situation and suggest solutions. Normally, this type of well is drilled with a slick positive displacement motor (PDM) set to a high bend setting. A reamer wing or bi-center bit is also utilized to enlarge the hole. However, the client wanted to improve hole quality, so they requested a new approach. Sperry engineers devised a solution that combined several different technologies in a single assembly.

**Sperry Innovation** – Sperry’s primary objective was to improve hole quality while preserving wellbore placement accuracy and rate of penetration (ROP). Because traditional methods were unsuccessful, Sperry hand-picked the equipment to meet rig requirements. The design was based on the Geo-Pilot rotary steerable system, which enables engineers to accurately steer the wellbore and increase ROP. The XR Reamer 1200 tool was also selected because of its history with high-angle extended reach applications and its ability to provide exceptional hole quality while enlarging the wellbore. To complete the design, Sperry included the Evader Gyro-While-Drilling service, which provides accurate wellbore position data and eliminates the need for wireline gyros. The resulting bottom hole assembly (BHA) was the first of its kind, tailor fit to the client’s needs. At this point, Sperry had a solution it was ready to use in the field.
THE NORTH SEA – The first global run of the new assembly was 100% successful. Where the old BHA had a history of problems, including poor hole quality, cementing issues, and a shortened lifetime for the well, Halliburton’s solution displayed superior performance in every aspect of its operation. Not only did it perform superbly in ROP and hole quality, the Geo-Pilot system also reduced operating time, decreased non-productive time and eliminated unnecessary tripping time. The liner was cleanly installed and the well’s overall life expectancy was increased thanks to Halliburton’s technical ingenuity and efficient fieldwork.

The result was a complete success, with improved hole quality, increased efficiency and a longer lifespan for the well. Overall, the operator realized tremendous benefits from this operation, which will only increase as these technologies spread to similar rigs in the area. The 12-15 hours of on-bottom drilling time saved translates to immediate benefit to the operator.