

XR-Perf System Deploys Extreme-Length Gun String to Perforate 393-ft Interval in Two Runs

North Sea operator saves at least three days of rig time and USD 1 million while reducing impact on the epoxy casing

CHALLENGE

Perforate a long interval in an injector well without causing damage to the epoxy casing.

SOLUTION

Use the XR-Perf* expanded-reach wireline perforating system incorporating high-strength, high-power, large-diameter coated coaxial cable to deploy long, heavy gun strings and minimize the number of runs.

RESULTS

Successfully perforated the 393-ft interval in only two runs instead of the usual seven runs to save up to three days of rig time and USD 1 million while reducing both impact on the casing and environmental risk.



The challenge of perforating long intervals in the North Sea

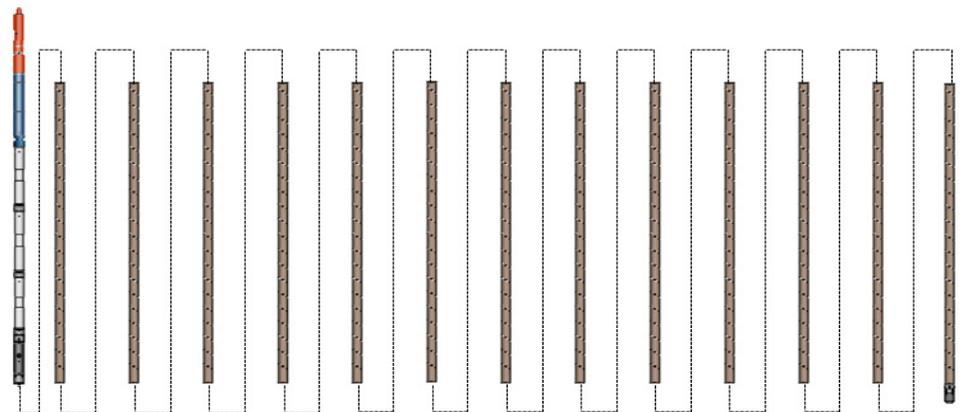
Long perforating jobs in the North Sea have a well-known history of pushing the operational limits for wireline deployment. Recently, an operator planned to perforate a 393-ft interval in an injector well with 2 $\frac{7}{8}$ -in HSD* high shot density perforating gun systems from a semisubmersible rig with a subsea riser. Adding to the challenge was that the 18,980-ft well had a glass-reinforced epoxy (GRE) completion to aid corrosion resistance. The operator was concerned about both the risks posed by making numerous wireline runs—which would be required by the limits of conventional cable—to perforate the long interval and how those would affect the GRE completion.

Advanced wireline conveyance system with expanded capabilities and efficiency

Schlumberger proposed using the new XR-Perf expanded-range wireline perforating system for the operation. The XR-Perf system integrates the latest industry-leading cables, units, and perforating accessories to streamline perforating logistics while increasing operational capabilities. High-strength, high-power 0.44-in-diameter coaxial cable with a polymer-encapsulated coating was specified because the smooth exterior jacket would reduce cable friction on the tubulars to minimize the impact on the completion. The coated cable also enabled using a specifically designed dual packoff as part of the pressure control equipment (PCE) instead of the conventional grease injection head, which would help reduce environmental risk.

Savings of 3 days and USD 1 million from successful deployment of extreme-length design

The subsea riser allowed deployment of long guns into the well for perforating in a balanced condition, and conveyance simulation was performed to model the job. The configuration was further optimized by conducting shock modeling using the proprietary PURE Planner* perforation job planning application. The resulting XR-Perf system made it possible to deploy an extreme-length design in only two runs for the 393-ft interval, including one run with a 267-ft gun length weighing 3,912 lbm. Reducing the total number of runs from the typical seven runs for this interval length saved up to three days of rig time and more than USD 1 million while reducing the impact of the wireline runs on the GRE and also the environmental risk.



One of the two XR-Perf system runs in the well used a 267-ft length of the 2 $\frac{7}{8}$ -in HSD high shot density gun system (drawing not to scale).

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