Benefits
- New design applicable for other HP/HT subsea and jackup reservoirs
- Provided access to previously unattainable reservoirs
- First North Sea subsea high-angle HP/HT well to be completed using a semi-submersible rig
- High operating efficiency achieved
- Zero HSE incidents

Background and challenges
- Operate successfully in HP/HT environment
- Reach and access previously unattainable reservoirs
- Avoid escalating costs and avoid HSE issues
- Kristin, operated by Statoil, offshore Norway

Baker Hughes solution and results
- Applied FLEX-LOCK/ZXP screen/liner hanger, T-Series TSM-13.5 downhole safety valve, SB-3 completion packer, DAB barrier packer, and Extreme EOFH-ET slickline plugs
- All phases of operations resulted in higher efficiency and zero HSE incidents during completion installations

Statoil wanted to drill, complete, and produce high-pressure/high-temperature (HP/HT) standard and extended-reach wells with zero HSE incidents. The Kristin HP/HT subsea development is 149 mi (240 km) off Norway in 1,115-ft (340-m) water depth with a 380°F (170°C) bottomhole temperature, 13,195-psi (910-bar) bottomhole pressure gas condensate reservoir.

The equipment used included a T-Series™ TSM-13.5 downhole safety valve, an SB-3™ completion packer, a DAB™ barrier packer, Extreme™ EOFH-ET slickline plugs, and a FLEX-LOCK™/ZXP™ screen/liner hanger.

The tool design and procedures evolution is an important piece of a larger integrated system that allows the operator to produce wells that would not have been possible if the technology advancement had not been made. This completion design is applicable for future HP/HT subsea and jackup wells.

Kristin was the first North Sea subsea HP/HT high-angle well to be drilled and completed using a semi-submersible rig. The goal was to deliver a subsea completion solution based on existing and new HP/HT technology. From there, the completion design, quality assurance plan, and operating procedures evolved, resulting in high operating efficiency and zero HSE incidents during the completion installations.